The 8th Annual

Undergraduate Research & Scholarship Symposium

April 6, 2016
Power Center Ballroom

Sponsored by:
Academic Affairs
Office of the Provost
Office of Research
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ACKNOWLEDGEMENTS

The organizers would like to thank all of the faculty mentors for their service and support of our undergraduate scholars.

A special thank you to the Bayer School of Natural and Environmental Sciences for their generous donation of the corkboards.

We would also like to thank the following organizations and individuals for their generous support of this important event:

- Academic Affairs
- Bayer School of Natural and Environmental Sciences
- Center for African Studies
- Center for the Catholic Intellectual Tradition
- Center for Spiritan Studies
- Center for Teaching Excellence
- Committee of Student Jurors
- Counselor Education Program
- Enrollment Management Group
- Gumberg Library
- Honors College
- History Department
- Mary Pappert School of Music
- McAnulty College and Graduate School of Liberal Arts
- Mylan School of Pharmacy
- Office of the Provost
- Office of Multicultural Affairs
- Phi Kappa Phi
- Rangos School of Health Sciences
- School of Nursing
- University Academic Sustainability Committee
- DU Undergraduate Christine DeAndrea for the cover design
- Office of Research, Christine Pollock, & Mary McConnell

Honors College Student Jury: Matt Caprio, Joseph Caraway, Abby Catalano, Veronica Cwalina, C. Thomas Dean, Zoe Dinehart, Josef DiPietrantonio, Dan Fadden, Kiana Fussner, Lauren Giel, Julie Gillis, Sophie Graf, Meg Hockman, Alivia Kusiak, Edward Lippl, Alexandra Melendez, Sophie Noonan, Joe Ratay, Leah Woodard
April 6, 2016

Students, Faculty, and Guests:

Welcome to the 8th Duquesne Undergraduate Research and Scholarship Symposium (URSS). This event recognizes the achievements of our undergraduate scholars and the support of their faculty advisors highlighting the scholarship which is fundamental Duquesne education.

The URSS has become over the last seven years a celebration of the breadth of topics explored by our undergraduate scholars. This year’s event is one of the largest gathering of undergraduate scholars to date with 147 entries and over 210 participants.

I would like to thank all of our participating undergraduates for their hard work and the excellent posters and presentations they have developed. I especially want to thank our faculty who train and encourage young scholars and without whom this event would not be possible.

The URSS has depended on our sponsors who provide numerous awards in recognition for exceptional scholarship and on our judges who give their time to make this an outstanding experience for our students. Their continued support has been essential to the success of the symposium.

Finally I must thank the organizing committee and the Office of Research staff who devote their time to ensuring the success of this event.

Enjoy the day, celebrate your scholarship, and share that of your fellow undergraduate students across the all of the disciplines which are part of Duquesne University.

Sincerely,

[Signature]

Alan W. Seadler Ph.D.
Tuesday, April 5, 2016 | Power Center Ballroom:

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| 9:30 a.m. to 2:00 p.m. | **Student Participant Set-Up**  
Participants are required to stop by, sign in and set up posters during this time. |
| 2:00 to 4:00 p.m.   | **Welcome Reception for Participants, Judges and Faculty (Shepperson Suite)**  
DU Faculty, student participants, and URSS award sponsors/judges are invited to attend. Light appetizers will be served. |
| 4:00 to 7:00 p.m.   | **Judges-Only “Sneak Peek” of Posters**  
Judges are invited to view posters (without students present) at this time. |
**SCHEDULE**

Wednesday, April 6, 2016 | Power Center Ballroom

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<td>8:00 to 8:30 a.m.</td>
<td><strong>Student Participant Check in</strong></td>
<td>Continental Breakfast provided for participants.</td>
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<td>8:30 to 9:30 a.m.</td>
<td><strong>Open Poster Session and Judging</strong></td>
<td>Guests are invited to walk around, peruse student projects and engage with students.</td>
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| 9:30 to 10:00 a.m. | **Keynote Speaker**                             | “How my undergraduate thesis on Jacksonian Democracy led me to look to Prohibition to explain modern police shootings.”  
**Wesley M. Oliver, J.D., LL.M., J.S.D., Associate Dean for Faculty Scholarship, Criminal Justice Program Director and Professor of Law**  
Participants and Attendees listen to keynote speech.  
*Poster session is closed at this time.* |
| 10:00 to 10:45 a.m.| **Open Poster Session and Judging**             | Guests are invited to walk around, peruse student projects and engage with students.              |
| 10:45 a.m. to Noon | **Oral Presentation Sessions 1**                | Students participating in the poster sessions *should attend* the formal presentations.  
*Poster Session is closed at this time. Please respect the formal presenters.* |
| Noon to 12:30 p.m. | **Open Poster Session and Judging**             | Boxed lunches provided for participants and judges. We encourage you to eat your lunches while viewing posters. |
| 12:30 to 1:45 p.m. | **Oral Presentation Session 2**                | Students participating in the poster sessions *should attend* the formal presentations.  
*Poster Session is closed at this time. Please respect the formal presenters.* |
| 1:45 to 3:00 p.m.  | **Open Poster Session and Judging**             | Guests are invited to walk around, peruse student projects and engage with students.              |
| 3:00 p.m.          | **Awards and Closing Remarks**                  |                                                                                                  |
ORAL PRESENTATIONS: SESSION 1

10:45 a.m. Alfred Vogt
“Combatting Human Trafficking Using Mathematics”
Mathematics | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Rachael Miller Neilan, Ph.D.
Abstract Number: 26

11:00 a.m. Gage Tiber
“Detection of Lead in Drinking Water using Homemade and Inexpensive LED-based Fluorometer”
Physics | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Theodore Corcovilos, Ph.D.
Abstract Number: 31

11:15 a.m. Jacob Leonowitz
“Reevaluating Perceptions of Tchaikovsky’s Pathétique Symphony”
Music Education | Mary Pappert School of Music
Faculty Advisor: Benjamin Binder, Ph.D.
Abstract Number: 77

11:30 a.m. Brian D’Orazio
“How Much Is Enough? Financial Institutions And Anti-Money Laundering Regulation”
Economics, Mathematics | A.J. Palumbo School of Business Administration
Faculty Advisor: Kevin Shaver, Ph.D.
Abstract Number: 52

11:45 a.m. Justin Stec
“Narrative Catalysis: Reading Skeuomorphism in Geoffrey Chaucer’s House of Fame”
English Literature, Biochemistry, Mathematics | McAnulty College and Graduate School of Liberal Arts | Faculty Advisor: Sarah Wright, Ph.D.
Abstract Number: 69
12:30 p.m. **Taylor Cavalovitch**  
“*Representation Matters: How Representation in Children’s Literature Influences Children of Different Ethnicities*”  
Early Childhood Education | School of Education | Faculty Advisor: Sandra Quiñones, Ph.D.  
Abstract Number: 80

12:45 p.m. **Sadiq Ali Shaik**  
“*Macromolecular Crowding Effects on LDH*”  
Biochemistry | Bayer School of Natural and Environmental Sciences  
Faculty Advisor: David Seybert, Ph.D.  
Abstract Number: 63

1:00 p.m. **Julia Marn**  
“*Blood Brain Barrier Integrity in a Murine Model of BCR-ABL Induced Acute Lymphoblastic Leukemia*”  
Physician Assistant | Rangos School of Health Sciences | Faculty Advisor: Bridget Calhoun, Ph.D.  
Abstract Number: 17

1:15 p.m. **Michael Rand**  
“*An Alternative Approach to Determining Capital Reserves for Commercial Loan Portfolios under Basel Regulation*”  
Economics and Mathematics | A.J. Palumbo School of Business Administration  
McAnulty College and Graduate School of Liberal Arts  
Faculty Advisor: Antony Davis, Ph.D.  
Abstract Number: 11

1:30 p.m. **Jennifer Hoh**  
“*Vancomycin dosing considerations in patients with liver cirrhosis*”  
Pharmacy | Mylan School of Pharmacy | Faculty Advisor: Branden Nemecek, PharmD, BCPS, Anthony Guarascio, PharmD, BCPS  
Abstract Number: 114
Special Awards

Bayer School of Natural and Environmental Sciences
2 for Excellence in Research in the Basic Sciences: $300
Students participating in the Undergraduate Research & Scholarship Symposium whose project fall within the realm of the basic sciences will be considered for this award.

Center for the Catholic Intellectual Tradition and Center for Spiritan Studies
Catholic Intellectual Tradition and Spiritan Studies Award for Undergraduate Research: $250
The aim of this award is to celebrate and encourage undergraduate research that engages resources in Catholic intellectual traditions in general or Spiritan sources more particularly.

Center for African Studies
Award for Undergraduate Research: $250
This award is intended to encourage and reward undergraduate research in African Studies and related areas that engage Duquesne's ongoing commitment to Africa.

Center for Teaching Excellence
Award for Undergraduate Research: $250
CTE is pleased to honor a project that focuses on the study of human learning in any of its many contexts, including but not limited to K-12 education, college, community, and clinical settings. Eligible projects will explore topics such as how and where learning happens or what empowers or hinders people in their learning.

Counselor Education Program
Award for Undergraduate Research: $250
Preference for this award will be given to research topics related to the mental health, school, and marriage and family counseling fields, such as addiction, mental health diagnosis, advocacy, child development issues, trauma and crisis response, etc.

Department of History
The Clio Award for Undergraduate Research in History
First Place: $200
Second Place: $100
Third Place: $50 and a History Department T-Shirt
Undergraduate History and Art History majors or minors who present their research at the URSS via poster or paper are eligible for this award.

Gumberg Library
Gumberg Library Award for Undergraduate Research: $250
The Gumberg Library Award judges posters based on their intellectual merits and demonstration that the research presented meets the standard of its field.
Honors College
Outstanding Poster: $250
Symposia posters are at their best when they optimally combine intellectual sophistication with legibility to the non-specialist. Therefore, criteria for this award include: scholarly rigor; visual appeal; organization; professional polish.

Mary Pappert School of Music
Mary Pappert School of Music Undergraduate Award: $250
The Mary Pappert School of Music Undergraduate Award is open to all music students who participate in the URSS.

McAnulty College and Graduate School of Liberal Arts
Outstanding Research Merit: $250
The McAnulty College and Graduate School of Liberal Arts Outstanding Merit Award is open to undergraduate participants in the liberal arts. A committee of Liberal Arts faculty and administrators will evaluate the posters’ intellectual merits and demonstration that the research presented meets the standard of its field.

Mylan School of Pharmacy
Award for Undergraduate Research: $250
The Mylan School of Pharmacy Award for Undergraduate Research serves to recognize projects in the field of pharmacy which demonstrate a high level of scholarly merit.

Office of the Provost
Outstanding Scholarship Award: $250
1 for Honorable Mention: $125
1 for Best Formal Presentation: $125
This award serves to recognize outstanding scholarship within the university across all of the fields of study. The awards will be given to a student demonstrating exceptional scholarship through either poster or oral presentation.

Office of Multicultural Affairs
Outstanding Undergraduate Research: $250
The Office of Multicultural Affairs (OMA) is pleased to sponsor an award for outstanding, undergraduate research. The aim of this award is to recognize and celebrate research that contributes to creating, and maintaining an inclusive campus community here at Duquesne University and in the Greater Pittsburgh area.

Phi Kappa Phi, National Honors Society
Outstanding Research: $500
2 for Honorable Mention: $250
Posters from all disciplines accepted to the URSS will be considered for the Phi Kappa Phi Awards.
Rangos School of Health Sciences
2 for Rangos School of Health Sciences Award for Undergraduate Research: $250
Students of the Health Sciences who are participating in the URSS will be eligible for these awards.

School of Nursing
School of Nursing Undergraduate Research Award: $250
The School of Nursing Undergraduate Award is available to students participating in the URSS whose research is applicable to the healthcare and/or nursing field. Projects will be evaluated based upon the use of existing research for support, understanding and application of principles of research, effective communication, etc.

University Academic Sustainability Committee
Excellence in Sustainability & the Environment: $250
Projects demonstrating excellence with a focus on sustainability and the environment will be considered for this award.
Wesley M. Oliver, J.D., LL.M., J.S.D.

Associate Dean for Faculty Scholarship
Criminal Justice Program Director
Professor of Law
Duquesne University

Wesley M. Oliver is associate dean for faculty scholarship, director of the criminal justice program, and professor of law at Duquesne University School of Law. He teaches in the areas of criminal law, criminal procedure, and constitutional law. His scholarship has examined numerous aspects of criminal law and procedure, including search and seizure, interrogations, material witness detentions, wiretapping, plea bargaining, Prohibition, and the history of policing. He is a graduate of the University of Virginia and the University of Virginia School of Law and hold a doctorate in juridical science from Yale Law School. He practiced criminal law in Nashville, Tennessee prior to entering academia.
1 Efficacy of the Box Cox Transformation in Randomized Controlled Trials
Andrew Magyan, Frank D’Amico, Ph.D.
Junior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Frank D’Amico, Ph.D.

ABSTRACT:
Introduction: Randomized controlled trials (RCTs) are used to test the effects of every drug that is distributed on the market today. The major statistical tests require the assumptions of normality and equality of variances. These tests include the student’s T-test for comparing two groups, analysis of variance for more than two groups, or simple linear regression for continuous variables. When these assumptions are violated, nonparametric statistical tests could be used as an alternative. Objective: The main objective is to show appropriate transformations that can be employed to correct for the violations; particularly how the Box-Cox transformation can be used to correct for violations. Methods: The process to address the objective will be: 1) Demonstrate what transformations are and why they are needed. 2) How to tell when a variable is violating an assumption. 3) Explain various types of transformations (For example: Square root, Logarithmic, Arc-Sine, and ultimately the Box-Cox). 4) Compare the power efficiency of each transformation. 5) Explore alternate methods of data analysis for when transformations are not effective. Results: Using datasets from actual randomized controlled trials, basic transformations do improve the violations. However, the Box-Cox exponential form (which is not commonly seen in literature) has the highest benefit in modifying the data to meet the assumptions. Conclusion: Using skewed, non-normal data, the Box-Cox transformation had the highest statistical power to perform the statistical tests. The methods outlined provide a guide for readers to conduct appropriate statistical analysis in future research efforts.

2 Salamander Skin Peptides Act as Primary Defense Mechanism
Andrew Magyan, Sarah Woodley, Ph.D.
Junior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Sarah Woodley, Ph.D.

ABSTRACT:
Batrachochytrium dendrobatidis (Bd) is a fungal pathogen that infects amphibian skin and restricts osmoregulation which can cause mortality. This fungus has been a contributor to the major population declines of amphibians throughout the world in recent decades. Some amphibian species are highly susceptible to the fungus, while others resist or tolerate infection. The reasons behind this are not understood, but it is theorized that peptides secreted from the skin act as a primary defense mechanism, and that differences in susceptibility are due to the variations in natural peptide concentrations among species. I tested the hypothesis that skin peptides would inhibit the growth of Bd
in red-legged salamanders (Plethodon Shermani), a species that is fairly resistant to infection by Bd. At a variety of concentrations, the peptides and Bd were grown together on a 96 well plate and absorbance was measured daily for ten days. It was found that skin peptides from P. Shermani successfully inhibited the growth of Bd at high concentrations. A range of Bd proliferation can be observed, as less peptide allows for more fungal growth. Thus, skin peptides found in the secretions of P. shermani salamanders do confer resistance to the growth of the Bd fungus. These results show that salamanders have a natural defense mechanism to infection, which is similar to that observed in frogs. In future experiments, other amphibian species will be tested as well as a similar strain of pathogenic fungus, Batrachochytrium salamandivorans.

3 Primer Optimization for Allelic Databasing of Felis catus
Conner Graca, Rebecca Goldinger
Senior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Lisa Ludvico, Ph.D.

ABSTRACT:
Domestic cats are popular household pets that leave ample traces of their DNA in the form of hairs and saliva in and around their territories. These traces are invaluable in forensic science for their potential of individualizing crime scenes; however short tandem repeat (STR) genotyping of Felis catis populations has no consensus in the forensic community. This project aims to add utility to these DNA traces in crime scenes though the creation of a database of alleles on specific loci in a Western Pennsylvania population of feral cats. The first goal of this project is to use molecular DNA techniques, including polymerase chain reaction (PCR) and Capillary Electrophoresis, to optimize a set of five known DNA primers from previous studies for use on extracted DNA samples from ear tips of individual cats. We used six ear tip samples and two controls to test our primers under varying experimental conditions, including annealing temperature, sample and primer concentration, and primer mix ratios to achieve optimum clarity and consistency in our analysis. Secondly, we aim to use those same molecular techniques, along with GeneMarker analysis software, to analyze at least 90 individual samples and create a comprehensive database of STRs for use in forensic science. The final goal of this project is to use the results from our fragment analysis to examine kinship patterns in our colonies of feral cats.

4 Understanding the Neuropsychology of Poverty: Connections between Environment and Development of Cognition
Marisa Ross
Senior | Biology and Psychology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Alexander Kranjec, Ph.D.

ABSTRACT:
It is well established that the environment in which an individual is raised has significant impacts on physical, emotional, and cognitive development. Within the last three decades, basic and cognitive neuroscience have attempted to understand the associations between cognitive development and the
high-stress environment of low socioeconomic status (SES) from various approaches, including behavioral and longitudinal studies, neuroimaging and, more recently, genetic and epigenetic modifications. Due to the complex nature of SES as a social construct, researchers have chosen to focus their research on single cofactors associated with poverty. This paper aims to review one such cofactor, the toxic environmental stress associated with low SES conditions, and its impact on cognitive function. A second aim is to review the nascent research in the field of genetics and epigenetics as they relate to individual susceptibility to the symptoms associated with chronic poverty. Finally, this paper aims to propose new directions for interventions to mediate the impacts of poverty on cognitive development.

5 A Comparison of Nonparametric Statistical Tests in Randomized Clinical Trials when Statistical Assumptions Are Violated
Rachel McCafferty
Senior | Biochemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Frank D’Amico, Ph.D.

A B S T R A C T:
Introduction: It is often the case that data arising in randomized clinical trials (RCTs) require “non-standard” analyses because of violations of certain statistical assumptions. These assumptions consist of the dependent variable having a normal distribution and equality of variances among the treatment groups. When the assumptions of normality are disrupted, alternate solutions, such as, distribution-free, nonparametric statistical tests are appropriate. Objective: The main objective is to demonstrate how nonparametric statistical tests can be used to analyze data from randomized controlled trials when assumptions are violated. Methods: The process of addressing the objective consists of: (1) describe the differences between parametric and nonparametric tests, (2) show by examples how to detect when the assumptions are incorrect, and (3) illustrate how to test for differences in two groups and more than two groups when the violations are severely questionable. Results: Using actual data sets from RCTs, I will compare both the parametric and nonparametric tests in the following situations: (1) Student’s t-test vs. the Mann Whitney U for two-sample unpaired, (2) the Paired t-test vs. the Signed Rank test for two-sample paired data, and (3) 1-way Analysis of Variance (AOV) vs. Kruskal Wallis test for multi-sample comparisons. Conclusion: When assumptions of normality and equality of variances are violated, approximations to the null distributions of parametric statistics are no longer valid. In which case, nonparametric methods can be used in these cases to alleviate the violations without losing statistical power.

6 A Legacy Forged in Sacrifice
Tara Ritz
Sophomore | History/International Relations | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Matthew Hyland, Ph.D.

A B S T R A C T:
The legacy of the battle of Iwo Jima will forever be remembered in the famous flag-raising picture, but it
should also be remembered for the strength of the human spirit and the unimaginable sacrifices made by every man on the island. Iwo Jima was the smallest island that the United States Marines fought on during World War Two, yet it was one of the bloodiest battles. A battle that was supposed to be short lived turned into an epic struggle of inch by bloody inch. The casualties on both the American and Japanese sides were incredible and the battle seemed impossible to win, but that did not stop either side from fighting for their causes. The island of Iwo Jima was strategically crucial for the Marines on their island-hopping campaign through the Pacific Ocean. Airfields on Iwo Jima were critical to the bombing of Japan due to the island's proximity to the home islands of Japan. In this essay I analyze the ferocity of the battle and how Iwo Jima, which was supposed to be a quick fight turned into the defining battle for the United States Marines. The battle of Iwo Jima truly profiles the human spirit, true sacrifice and patriotism. As Americans, and as humans we must remember and regard the sacrifices made at war, we must remember the strength of the human spirit; the battle of Iwo Jima proves just how tenacious, determined, and selfless human beings can be even when in the most dire of circumstances.

7 A Missed Opportunity: Health Maintenance Organizations as Universal Health Care
Jake Roba
Junior | History and Economics | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT:
In the 1970s, Richard Nixon began to implement a new health care strategy that utilized Health Maintenance Organizations (HMOs) to combat increasing medical costs. These increasing costs had become a national crisis overwhelming the private and public sector. The primary health care question changed from how people could access health care to how people would pay for health care. Thus, the Nixon Administration attempted to use the private sector to offer affordable insurance to the vast population of the United States, providing a contrast to Senator Edward Kennedy's (D-MA) proposed single payer system ran by the federal government. Today, the Affordable Care Act has largely solved the access question, but like in the 1970s the issue of how to pay for this coverage is a rising concern that HMOs can solve. Looking to the 1970s is important because several changes to HMOs would make them successful, including the abolishment of certificate of need laws and independent practice associations which used fee-for-service payment within HMOs, a more equal market for HMOs to compete in, and the elimination of for-profit HMOs.

8 A Qualitative Analysis ofProtocols of Fibromyalgia Patients
Hannah Cawoski, Samuel Stitzel
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Vincent Giannetti, Ph.D.

ABSTRACT:
Fibromyalgia is a disease that has been validated through The International Classification of Diseases. Fibromyalgia is a disease that requires physical and emotional support, medication, attention, and
Fibromyalgia needs to be treated as a multidimensional disease so that both symptom management and quality of life can be maintained.

This research is a qualitative study that will discuss the common themes emerging from patient experiences with fibromyalgia. An open-ended question from a national survey of fibromyalgia patients (n=316) yielded written patient protocols of patients explaining their experiences with the disease of fibromyalgia. A systematic literature review was conducted using, but not limited to, the following databases (PubMed, Google Scholar, ProQuest Psychology, Cochrane Library) and key words (fibromyalgia and family, illness experience, pain and fibromyalgia, patient focus group, invalidation, physician stigma) to develop a codebook to classify themes. In addition, the protocols were analyzed for any themes not captured in the literature review. Themes that were discovered through the literature review are: invalidation, lack of healthcare access, stigma, social isolation, financial burden, and mental illness comorbidities. Once the codebook is developed, the protocols will be analyzed for dominant themes and relationships among the themes utilizing both conceptual and relational analysis as units of measurement. Two independent raters will be utilized to identify the themes and inter-rater reliability will be established the findings will be discussed in relation to the literature regarding illness experience of fibromyalgia.

9 Accessibility of Prison Re-Entry Services in Allegheny County

Remi Annunziata
Senior | Self-Design Public Policy | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Michael Irwin, Ph.D.

ABSTRACT:
This project seeks to assess the accessibility of prison re-entry services in Allegheny County for the formerly incarcerated population. Through the use of GIS software, re-entry services for the county will be mapped using unique symbols to easily identify the types of services offered. Crime rates in Pittsburgh will also be mapped, using studies that support the hypothesis that people return to the communities in which their crime was committed after serving prison time; therefore higher crime rates also mean a high population of people who served prison time.

10 Acetic Acid (Vinegar) as an Antifungal Agent for Forensic DNA Analysis

Beatriz Pujols, Lyndsie Ferrara, M.S.
Senior | Forensic Science and Law | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Lisa Ludvico, Ph.D.

ABSTRACT:
Forensic laboratories across the United States face an ever-growing backlog issue, particularly with an excess amount of untested sexual assault kits. The most common piece of evidence in these kits is a vaginal swab. If not collected and stored properly, vaginal swabs can develop mold over time. The longer they are exposed to improper conditions, the more the evidence is compromised. Traditionally, a differential DNA extraction procedure is performed on these samples. This extraction involves wash
steps, which theoretically gets rid of any contaminants. When dealing with moldy samples, further cleanup techniques are needed. Mold is a known PCR inhibitor; therefore laboratories often throw out samples that exhibit mold growth, as these often fail to produce a profile. This research tested the utility of a 5% acetic acid solution as a way to reduce the inhibition caused by the mold. Acetic acid (white vinegar) is commonly used to remove mold from kitchen and bathroom surfaces and clothing. This research tested the effectiveness of a 5% acetic acid solution inserted during different steps throughout the organic differential DNA extraction process. This modified organic differential DNA extraction method could allow for the analysis of mold-contaminated vaginal swab samples in sexual assault cases. This modification will limit the severity of inhibition and allow more accurate results in data analysis, as well as aid in the processing of samples previously deemed untestable.

*11 An Alternative Approach to Determining Capital Reserves for Commercial Loan Portfolios under Basel Regulation

Michael Rand  
Senior | Economics and Mathematics | A.J. Palumbo School of Business Administration  
Faculty Advisor: Antony Davies, Ph.D.

A B S T R A C T:
Regulation introduced in the Basel II Accords, and reaffirmed in the Basel III Accords, prescribe a methodology for determining the asset capital requirements for banks reaching the threshold of a Basel bank, i.e. $100 billion in assets. The process for determining the requisite amount of capital to protect the bank in the case of extreme loss is given under the structure of a Probability of Default (PD), Loss Given Default (LGD), and Exposure at Default (EAD) framework. In particular, the Internal Rating Based (IRB) approach provides a guided process to determine the required reserves for wholesale commercial loan portfolios. Previous research on the IRB process focuses mainly on how to determine the mean default rate of a pooled PD grade for a through-the-cycle (TTC) scenario, both effectively and efficiently. In this paper, I examine how treating the PD distribution as discrete lends to introducing unnecessary inaccuracy into the model calculation of capital reserves for non-defaulted obligors. I also examine how the introduction of a shift in the observed mean in PD ranges on a 1-13 scale for a theoretical commercial loan portfolio introduces measurable differences in capital requirements for the same.

12 An Analysis of Two Aphasia Group Treatment Models

Kara DiNofrio, Caterina Staltari  
Junior | Speech and Language Pathology | Rangos School of Health Sciences  
Faculty Advisor: Caterina Staltari, M.A., CCC-SLP

A B S T R A C T:
Group treatment for aphasia has been shown to be effective (Elman 2007, 6). Throughout the literature there are a variety of approaches and/or treatment models for aphasia group therapy including Thematic Group Treatment, Book Connection Group Treatment, Script Training in Group Treatment, Problem Focused Group Treatment, Semantic Feature Analysis in Group Treatment, and Peer Led Group
Treatment (Elman 2007). They all focus on enhancing communication efficacy and independence. Two approaches in particular that will be reviewed include the Thematic Group Treatment, by Garret, Moir and Staltari, and the Book Connection Group Treatment, by Bernstein-Elis and Elman. The purpose of this study is to identify the communication opportunities for the individuals with aphasia (i.e. number of turns, content information units (CIU)).

The same group of individuals with aphasia, from the Duquesne University Speech and Hearing Clinic, will be compared using the two models. In order to collect the appropriate data needed for the analysis, treatment session videos will be transcribed. A tally of the number of conversational turns each individual receives along one session and the content of each utterance, for both treatment approaches will be taken. This data collection will allow for the determination of the total number of conversational turns and CIU for each individual during the Thematic Group Treatment and Book Connections Treatment. After the data has been collected, content information units (CIU) will be analyzed along with conversational turns.

13 Analysis of MA-PMTs for a RICH Detector
Andrew Lendacky, Valery Kubarovsky, Andrey Kim
Senior | Physics | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Fatiha Benmokhtar, Ph.D.

A B S T R A C T:
Andrew Lendacky (Duquesne University) Fatiha Benmokhtar (Duquesne University) Valery Kubarovsky (Thomas Jefferson National Accelerator Facility) and Andrey Kim (University of Connecticut).

A Ring Imaging Cherenkov (RICH) detector is being added to the CLAS12 detector in Hall B at Thomas Jefferson National Accelerator Facility (TJNAF) to improve particle identification in the 3-8 GeV/c momentum range. Approximately four hundred Hamamatsu H12700 Multi-Anode Photomultiplier Tubes (MA-PMTs) are being used in this detector to measure photons emitted through Cherenkov Radiation. The efficiencies of the MA-PMT pixels play a major role in RICH detectors, as well as the MA-PMT’s lifespan and efficiency at various high voltages. By pulsing a Class 3b laser at H12700 MA-PMTs, characteristics of the single photoelectron spectrum and pixel efficiency were tested. Software development in a Java mySQL database program is under development at Duquesne University to store and analyze data from these tests and future similar tests.

14 Appropriate Antimicrobial Selection in Dental Practice
Natalie Kokta, Anthony J. Guarascio, PharmD, BCPS, Autumn Stewart, PharmD, BCACP
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Autumn Stewart, PharmD, BCACP

A B S T R A C T:
Antimicrobial resistance is a growing concern nationally with cause to limit misuse and overuse of antibiotics in health care. Pharmacists have the unique opportunity to influence the use of antibiotics
through collaboration with a variety of healthcare professionals, including dentists. Research has demonstrated that antimicrobial prescribing habits in dental practices often include inappropriate selection, frequency, and duration. Studies have also shown that patient expectations can influence the unnecessary use of antibiotics. The objective of this study is to assess the knowledge of and attitudes towards appropriate antibiotic use and prescribing among dental providers. The findings from this study will aid pharmacists in identifying the target areas for intervention to improve antibiotic selection and use.

This is an observational study using mixed qualitative and quantitative survey methods conducted among dental providers. A convenience sample of dentists from an adult dental practice were surveyed using a questionnaire with items designed to measure knowledge of antimicrobial selection, dosing, and duration in the treatment and prophylaxis of common odontogenic conditions. The questionnaire also included Likert-type questions to assess provider attitudes towards antimicrobial use, restraint, and opinions towards patient expectations for antimicrobial therapy. Demographic variables were also collected. Data will be compiled and analyzed using descriptive statistics.

15 Asymmetric catalysis of aqueous Mukaiyama aldol reactions by dinuclear zinc semi-crown ligands
Ayan Ahmed, Brandon Vernier, Jeffrey D. Evanseck, Jeffrey Rohde Junior | Biochemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jeffrey Evanseck, Ph.D.

A B S T R A C T:
Semi-crown ligands have been utilized in the asymmetric Mukaiyama aldol reactions involving enol silyl ethers; however, the factors that influence the stereoselectivity are not understood. Our previous work suggests that competition between the formyl and alpha hydrogen bonds between a chiral catalyst and the formyl or alpha hydrogen of the aldehyde play a critical role in the overall stereoselectivity. To understand the Mukaiyama aldol reaction, we investigate the Trost dinuclear zinc-based semi-crown ligand and its role in the reaction using the M06-2X functional paired with Dunning basis sets. Our discussion centers upon our energetic findings and consequences of the alpha and formal hydrogen bonds that occur separately for the electrophile and the nucleophile in the Mukaiyama aldol reaction. Our results contribute to the development of a rational strategy for designing catalysts for the Mukaiyama aldol reaction, which may serve to be an excellent template to expand to other asymmetric processes.

16 Biocide Resistance in a Bacterium Isolated from Unconventional Gas Well Produced Water
Jenna Kuhn, Tetiana Kondratyuk, Cecilia McGough, Heidi Twaddle, John F. Stolz, Ph.D.
Senior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: John Stolz, Ph.D.

A B S T R A C T:
The Marcellus Shale formation, located in Pennsylvania, has been developed for natural gas through
horizontal well drilling and hydraulic fracturing. In unconventional well development, rock fractures are created by injection of large quantities of water and proppant to extract gas from the non-porous rock beneath the surface. The fluids that return to the surface (e.g., flow back, produced water) are high in total dissolved solids (TDS) and are often stored in open impoundments and storage tanks. The fluids and impoundments are a rich source for microbes. Thus biocide is routinely used in most stages of the process. A strain of bacterium, designated as PW 9, was isolated from a produced water sample taken from a Pennsylvania unconventional well. It was routinely grown on a medium with high salinity (60 g/L NaCl) and TDS reflective of the produced water. Five different biocides were tested under three different dilution concentrations (1:10,000, 1:20,000, and 1:40,000 dilution of active). Growth of PW 9 was observed in controls (no biocide) and under all concentrations of glutaraldehyde tested. The other four biocides (Biocides 2-5) were effective at preventing growth. A challenge experiment (reinoculation with PW 9 after 7, 14, and 21 days) was carried out over a four week period. Only the lowest concentration of Biocide 5 showed some growth after 21 days. Glutaraldehyde was not effective and even stimulated growth of PW 9. These results suggest that alternative biocides are effective at the salt and ion concentrations encountered during shale gas extraction.

**17 Blood Brain Barrier Integrity in a Murine Model of BCR-ABL Induced Acute Lymphoblastic Leukemia**
Julia Marn
Junior | Physician Assistant | Rangos School of Health Sciences
Faculty Advisor: Bridget Calhoun, Ph.D.

**ABSTRACT:**
Breakdown of the blood brain barrier (BBB) is a classic feature of numerous neurological disorders. However, disruption of the BBB in acute leukemia is essentially unexplored. Using an established murine BCR-ABL ALL model, we report that C57BL/6 mice injected with BCR-ABL cells exhibited a significant increase in CNS vascular permeability, measured by leakage of FITC-dextran into the CNS. Assays were conducted to detect changes in both MMP-2 secretion and concentrations of selected cytokines associated with leukemic progression. Cytokine changes supported trends consistent with preliminary studies and previous literature. Levels of MMP-2 were decreased in the BCR-ABL model, contrasting the elevated results seen in an earlier AML model suggesting varying expression based on leukemia subtype. Furthermore, analysis of tight junction proteins revealed multiple locations of focal disruption of the BBB in BCR-ABL treated mice with no evidence of compromised integrity of the BBB in negative controls. With disruption of the BBB, neurotoxicity resulting from aggressive chemotherapy becomes a crucial concern. Therefore, despite rising cure rates of ALL, there is a critical urgency to further investigate the mechanisms and implications associated with BBB breakdown in leukemia to provide understanding for treating ALL while developing/implementing neuroprotective strategies to limit neurotoxic complications that threaten quality of life.

**18 Brothel Dramas and their Impact on Female Sexuality and Equality**
Charli Muszynski
ABSTRACT:
This essay will discuss brothel dramas and their impact during the early nineteen hundreds in Progressive Era. Brothel dramas helped women to be able to embrace their sexuality in masculine-dominated realistic theater, while simultaneously supporting and undermining the general strivings for equality. This work explores the idea of Victorian sexuality in terms of oppression, repression and suppression. This paper specifically focuses on the play Sapho, written by Clyde Fitch, and highlights movements of feminism by actress Olga Nethersole. Brothel dramas helped decrease censorship for women, and challenged the idea of the asexual, perfect "American girl" stereotype. These dramas showed “sisters in sin” who had fallen from grace as their main characters. This movement was essential for feminism, and has impacted the lives and expression of gender and sexuality for women today. Brothel Dramas were beneficial to women because they exposed this secret world, and opened up discussions that were completely off-limits in the Victorian ages.

19 Buddhism in the United States
Alexxis Langton
Sophomore | Physician Assistant | Rangos School of Health Sciences
Faculty Advisor: Marinus Iwuchukwu, Ph.D.

ABSTRACT:
Buddhism is one of the world’s oldest religions and has spread to the United States. Although the United States has carried on some traditions from the past, the U.S. has adopted some of its own common features and ways of practicing Buddhism. Buddhism spread to the United States in two ways. These two ways include Chinese immigrants settling in the Western parts of the United States in addition to North Americans and Europeans bringing back Buddhist texts when they visited Asia. An increased interest in Buddhism has come about in the United States over the past years due to the stress of an economy that is not stable, threats by terrorism, and violence. More people have also been interested in meditation and being mindful of one’s own thoughts. People who believe in Buddhism feel that their goal is to reach rebirth.

20 Business of Athletics: Dynamics Between Collegiate Athletic Organizations and the Business World
Malcolm Guya
Senior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Elizabeth Brown, MA

ABSTRACT:
The goal of this conceptual research is to study the organizational structure of successful, failing, and growing athletic departments in relation to the organizational structures of successful companies. The present study aims to discern what structural changes are necessary for athletic departments to move
towards a more successful path in student-athlete graduation rates, athletic performance, and Title IX compliance. Prior research shows that athletic organizations have four primary roles as defenders, prospectors, analyzers, and reactors, each which lead to different types of success (Miles and Snow, 1978). Task interdependence such as pooled, sequential, reciprocal and team play a factor in the manner that work flows within an organization, ultimately leading to success (Thompson, 1967). These prior studies, combined with Schein’s (1992) study of organizational culture and performance, can provide great insight into how to lead a struggling athletic department into future success by making minor changes over time. The author of the present study will present a conceptual review of the literature in preparation for a study to be conducted in the summer and fall of 2016. Potential participants for this study include coaches and student athletes at Carnegie Mellon University, University of Pittsburgh, and Duquesne University, which all represent different levels of college athletics. Methodologies to be employed may include surveys (e.g., the Organizational Culture Inventory (OCI); Cooke & Laferty, 1989) and in-person narrative interviews to gain insight into these programs’ current structures.

21 Characterization and Regulation of Steroid Sulfatase in the NIH-3T3 Fibroblast Cell Line
Kara Jones, Christina Bennett, Michelle Dilick, Jude Kunst
Junior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Kyle Selcer, Ph.D.

A B S T R A C T:
Steroid hormones travel in blood as inactive sulfated forms. These sulfated steroids can be converted to active hormones in local tissues by the enzyme steroid sulfatase (STS). STS recently has been found to be induced by metabolic inflammatory diseases, such as obesity and fatty liver disease. STS appears to produce estrogens that may help ameliorate adverse inflammatory effects. However, inflammatory regulation of STS has been studied in only a few cell types (e.g., hepatocytes and osteoblasts). Information on other cell types would help establish if the STS response to inflammation is general or specific. We sought to determine if STS is regulated by inflammatory signals in the fibroblastic cell line NIH-3T3. Fibroblasts are common and widely distributed in the human body. Therefore, STS up-regulation in these cells could have major effects on overall estrogen production and associated anti-immune activity. Using a 3H-E1S conversion assay, STS activity was found to be present at high levels in NIH-3T3 cells in culture and in cell homogenates. STS activity was blocked by the known STS inhibitor EMATE, indicating the presence of authentic STS. The anti-inflammatory glucocorticoid cortisol, and its analog dexamethasone, both decreased STS activity in NIH-3T3 cells in culture. This supports the idea that STS is regulated as an immune response protein in these fibroblasts. Further experiments will test the glucocorticoid inhibitor RU-486, and inflammatory initiators TNFα and LPS. These experiments will help confirm that STS is regulated as an inflammatory protein in fibroblasts.

22 Characterization of a Spore-Associated Protein to Study Assembly of Streptomyces Spores
Zachary Resko, Kocher, Matthew; Moore, Carrie Ann; McCormick, Joseph R.
A B S T R A C T:
Streptomyces coelicolor is a model non-pathogenic filamentous bacterium that produces chains of spores from aerial hyphae. Linear plasmid SCP1 contains sapC, sapE, and sapD, which are genes that code for spore-associated proteins. Spore-associated protein SapC (17 kDa, no putative conserved domains) does not contain a normal secretion signal nor is the mechanism of secretion known. Sap proteins were identified by extraction from the spore surface using a non-lethal detergent wash and analyzed via SDS-PAGE, Coomassie blue staining and/or by Western Blot. In our preliminary studies, our strategy to study secretion was to use recombineering to fuse a passenger protein to the C-terminus of a spore-coat protein SapC. We chose a passenger protein that we could detect with an antibody, the β-subunit of the E. coli heat labile toxin (LTB). Results characterizing this fusion suggest that SapC-LTB was secreted and assembled on the spore surface. A current goal of this ongoing project is to analyze several constructed C-terminal truncations of SapC (SapC’-LTB) to locate the secretion and/or spore surface assembly signals of SapC. To further characterize SapC protein secretion, an N-terminal fusion of LTB to SapC was also constructed and LTB-SapC secretion is being analyzed. In the future, the use of Sap protein fusions to passenger proteins might lead to an additional method for vaccine delivery by assembling recombinant Streptomyces spores with epitopes displayed on the spore surface.

23 Characterization of Spore-Associated Protein D for Use in the Development of Streptomyces coelicolor Spores for Vaccine Delivery
Brittany West, Mrohs, Kevin; Fucich, Daniel; McCormick, Joseph
Junior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Joseph McCormick, Ph.D.

A B S T R A C T:
One type of vaccine production has traditionally been explored using endospores from unicellular bacteria. However, similar use of exospores from filamentous bacteria, such as Streptomyces coelicolor, has not been investigated thoroughly. Spore-associated protein D (SapD) localizes to the surface of S. coelicolor spores and we have shown that SapD fused to the β-subunit of the heat labile toxin (LTB) of E. coli also localizes to the spore surface. Now, the primary focus of this project is to determine the location of the unknown secretion signal by creating truncations of SapD fused to LTB. The SapD-LTB C-Terminal truncation encoding constructs were inserted into the S. coelicolor chromosome in order to express the various C-Terminal truncated protein fusions and determine if they localize to the spore coat. Spore-associated proteins are being extracted and will be characterized using SDS-PAGE and western blot techniques. Because of the durability and longevity of spores and their associated proteins, antigens expressed on exospores could potentially result in an oral, nasal, or inhalation vaccine with extended shelf life.
24 Characterization of the Serotonin Transporter in the Lipid bilayer  
Andrew DeMarco, Nick Ferraro, Michael Cascio, Ph.D.  
Junior | Biochemistry | Bayer School of Natural and Environmental Sciences  
Faculty Advisor: Michael Cascio, Ph.D.

ABSTRACT:  
Serotonin (5-HT) is a neurotransmitter; altered serotonin levels contribute to multiple disease states, including but not limited to depression and neuropathic pain. Levels of synaptic serotonin is partially regulated by the serotonin transporter (SERT), making it a potential therapeutic target. Our laboratory seeks to study the structure and function of SERT. Human SERT was expressed by Tetracycline-Regulated Expression (T-REx) Human embryonic kidney cell lines (HEK-293); the product was then purified. Solubilized SERT samples were purified by affinity chromatography and reconstituted. The lipid-accessible structure of the reconstituted transporter in membranes was studied via photo-crosslinking to derivatized cholesterol followed by mass spectrometry (MS). This initial study determined the lipid-facing portions of SERT in the absence of any ligands, as well as identified potential cholesterol binding sites. These studies may be extended to examine state-dependent changes in the transporter.

25 Characterizing the Fusion of Spore-Associated Protein A to an Antigenic Marker in Bacterial Exosporas as a method of Vaccine Delivery  
Anita Ghosh, Gabriella Pugliese, Carrie Ann Moore, Joseph R. McCormick, Ph.D.  
Junior | Biology | Bayer School of Natural and Environmental Sciences  
Faculty Advisor: Joseph McCormick, Ph.D.

ABSTRACT:  
There are different types of vaccines that can be used to inoculate an individual against different diseases. Previously, endosporas from bacteria express recombinant antigenic markers fused to spore coat proteins (Cot); however, exosporas produced by non-pathogenic, filamentous bacteria such as Streptomyces coelicolor may also be used. S. coelicolor encodes multiple Saps that are secreted and localized to the spore coat. The aim was to characterize the secretion and localization of spore associated protein A (SapA) when fused with an antigenic marker at the C-terminus. Our strategy was to use recombineering to fuse the gene for the β-subunit of the E. coli heat labile toxin (ltb) to sapA within the chromosome. This gene fusion was constructed in E. coli and was introduced into S. coelicolor by conjugation. Currently, we are in the process of extracting spore-associated proteins from strains expressing SapA-Ltb, in order to determine if the fusion protein is successfully secreted and targeted to the surface of the spore. If this fusion is able to be secreted and localized to the spore coat, it may be a potential new mechanism for vaccine delivery.

*26 Combatting Human Trafficking Using Mathematics  
Alfred Vogt  
Senior | Mathematics | McAnulty College and Graduate School of Liberal Arts  
Faculty Advisor: Rachael Miller Neilan, Ph.D.
A B S T R A C T:
Human trafficking is the modern-day form of slavery. Human trafficking occurs on a daily basis throughout the United States with the majority of victims being women and children. Existing programs to reduce human trafficking are primarily focused on either the prevention of first-time victims or the aid of previously victimized individuals. In this study, we propose a mathematical model describing human trafficking of underage females and the use of prevention and short and long-term aid programs to reduce victimization. The model is a system of differential equations describing the movement of underage females between susceptible, victimized, and aided classes within an at-risk population. Prevention programs are included in the model as a reduction in the rate at which susceptible females are victimized. Both short and long-term aid programs move victims to separate classes in the model. The costs of implementing prevention and aid are estimated to reflect existing programs. Model solutions show the number of trafficking victims (both first-time and repeat victims) and the total costs associated with prevention and aid programs, respectively. Our goal is to use the mathematical framework to determine an appropriate balance of prevention and aid resources that minimizes both total costs and total number of victims over a given period of time.

27 Comparison of different decalcification and extraction techniques using deer bone as a model
Dana Kodger
Senior | Biochemistry – Forensic Science and Law | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Lisa Ludvico, Ph.D.

A B S T R A C T:
A wide range of methods for decalcification and extraction are currently in use when using bone as a source of DNA. There is no standardization and there is disagreement on which methods work better. Decalcification is commonly used in histological studies of bone tissue, and many methods result in the destruction of DNA in the bone tissue. It is unclear if the decalcification step increases DNA extraction efficiency. Additionally, a debate exists regarding the best type of extraction method for bones. In this study the effects of different decalcification techniques (14% EDTA, Formical 2000, and no treatment) were observed when using two common extraction methods (Silica and Organic). This study shows a difference exists between the methods, but a larger sample size is needed to make definitive conclusions.

28 Computing Isometries between Rational Quadratic Forms
Tyler Gaona
Junior | Mathematics | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Anna Haensch, Ph.D.

A B S T R A C T:
A quadratic form is a symmetric homogeneous polynomial of degree 2. We will define the notion of equivalence between quadratic forms and consider the relationship between quadratic forms and inner-
product spaces. We will present an algorithm that, given two equivalent quadratic forms, computes the transformation that maps one to the other.

**29 Critical Perspectives on Occupational Therapy Practice in Resource-Scarce African Contexts**

Molly Edwards, Chase Ratliff  
Senior | Occupational Therapy | Rangos School of Health Sciences  
Faculty Advisor: Anne Marie Hansen, EdD, OTR/L; FAOTA

**ABSTRACT:**

The purpose of this study is to uncover occupational therapists’ perspectives on primary challenges and barriers to providing services, contextual factors that impact OT practice, and how they overcome these barriers in Kenya and Uganda. Many OTs seek to travel globally to connect with OT in other countries; yet, few studies enlighten us to the challenges and successes of OT practice in resource-scarce contexts. This qualitative research design combines survey research methodology with qualitative focus group strategies to obtain and analyze the African OTs’ perspectives about their practice. The participants include 32 clinicians from Uganda and 27 clinicians from Kenya. Initial findings reveal that contextual factors impacting OT practice include weak government infrastructure, high incidence of poverty and unemployment, poor educational opportunities, rugged physical environment and cultural beliefs. Professional challenges include a lack of awareness of OT’s role, few job opportunities and limited opportunities for advancing OT skills and knowledge. Triumphs in practice include dedicated national OT leaders, the development of skills for evidence-based practice, and growing respect for OT by other professionals. The findings reveal that despite challenging contextual factors, cultural beliefs, and stigma around people with disabilities, OTs persevere and find creative ways to carry out practice, serving men, women, and children with disabilities and their families. This study informs our limited Western view of OT with a fresh perspective from African OTs, encouraging a rethinking of how to learn from our African colleagues on how to carry out creative and innovative practice in a research-scarce context.

**30 Curvature and Image Geometry in Image Processing**

Kinardi Isnata, James Matuk  
Senior | Computer Science and Mathematics | McAnulty College and Graduate School of Liberal Arts  
Faculty Advisor: Stacey Levine, Ph.D.

**ABSTRACT:**

Image processing is a field that lies in the intersection of mathematics, computer science, engineering, and statistics. The geometry of the object boundaries in an image continues to evolve as a critical tool for generating mathematically sound models that preserve important image features. In this work we have developed new mathematical models that use image geometry in the sense of curvature information to tackle two fundamental problems in image processing: image denoising and image fusion. The former aims to remove noise from an image, while the latter combines information from multiple images shot in the same field of view to create a single image with optimal properties. Our
results show these new techniques can be used to generate state of the art results in applications ranging from photography to medical image fusion.

**31 Detection of Lead in Drinking Water using Homemade and Inexpensive LED-based Fluorometer**
Gage Tiber, Aria Parangi, Partha Basu, and Theodore A. Corcovilos
Junior | Physics | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Theodore Corcovilos, Ph.D.

**Abstract:**
Lead is extremely poisonous when ingested and accumulates in the body causing damage over time even at small concentrations. A major source of exposure is from corroding service lines that deliver drinking water to homes. Current methods of detection are very expensive and require training to use. Machines for detection are very large, requiring samples to be taken from the field to a lab for testing. We have developed a device that is very low in cost, requires little to no training to operate, and is small enough for in-home testing. Our device is a fluorometer that uses LEDs and photodetectors to observe the absorption and emission spectra of a water sample with an added sensor molecule. The sensor molecule, Leadglow, was developed by Dr. Partha Basu at Duquesne University and selectively detects lead through fluorescence enhancement. Leadglow has two unique absorption and emission spectra in the presence and absence of lead, which are clear signs of the existence of lead in the sample. When in the presence of lead ions, Leadglow absorbs light at 389nm and re-emits it at 423nm with a quantum efficiency of 0.63. The intensity of emitted light depends on the concentration of lead in the sample. This device is able to detect concentrations of lead near EPA limits. With this, our group hopes to test homes in the Uptown and Hill District neighborhoods close to Duquesne Campus.

**32 Determining Desirability: Age’s Role in Deciding What Matters Most**
Tara Paterniti, Sarah Schech
Senior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Alex Kranjec, Ph.D.

**Abstract:**
The present study investigates the extent that personality traits and appearance determine desirability when people of different ages are selecting partners. Participants will be given a short survey, either online or in person, and asked to rank in order of preference nine “profiles” consisting of images paired with personality descriptions. In each profile, less desirable personality traits are paired with more attractive images and more desirable personality traits are paired with less attractive images. All images were acquired from The Chicago Face Database, a publically available database with hundreds of face stimuli rigorously normed for attractiveness. Some positive traits include “honest”, “motivated”, and “respectful” and some negative traits include “jealous”, “lazy”, and “short tempered”. Profile rankings will be compared between the two age groups. One hypothesis is that younger participants will prefer
more attractive profiles while older participants will place a relatively higher value on personality traits. This research may provide insight into how age effects the way romantic partners are selected.

33 Development of Design Space for Fluidized Bed Multiparticulates Coating Process
Kiana Motto, Hanzhou Feng
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Carl Anderson, Ph.D.

A B S T R A C T:
Coating is a manufacturing process used in multiple industries. In the pharmaceutical industry, it is a process in which an outer layer of material is applied to the surface of a dosage form to give it specific benefits compared to the uncoated dosage form. Some of these advantages include product identification, protection, and masking of unpleasant taste. Each of these advantages is important for the pharmaceutical product to perform as desired. However, there are numerous process parameters involved in the coating process as well as a lack of process understanding. This makes it difficult to achieve a quality coated product. In addition, coating is one of the final manufacturing processes and if there is error made at this step it can result in the entire product batch being rejected and increased manufacturing costs. The purpose of this experiment is to improve coating process understanding and establish a knowledge base and design space for the coating process. Samples were prepared by coating beads in a fluidized bed and the experiment was designed by use of full factorial design. In order to analyze the critical quality attributes of the samples, sieve analysis was used to test for agglomeration and UV analysis was performed to measure content uniformity and the percent yield. The data was then analyzed using multi-variate linear regression. The results of this experiment have helped to improve process understanding. This has long-term future implications to reduce manufacturing costs and to improve product quality and affordability for patients.

34 DNA Barcoding of Stomach Contents Reveals Trophic Competition among Three Species of Trout
Brandon Hoenig, Brian K. Trevelline, Timothy J. Nuttle, Brady A. Porter, Ph.D.
Senior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Brady Porter, Ph.D.

A B S T R A C T:
Powdermill Run in the Laurel Highlands is one of only a few streams in Pennsylvania where stable, naturally-reproducing populations of the native Brook trout (Salvelinus fontinalis) coexist with both introduced Brown trout (Salmo trutta) and Rainbow trout (Oncorhynchus mykiss) populations. With great similarity in body shape and potential overlap in habitat distribution and insectivorous diet, these three species of trout would seem to violate the principle of competitive exclusion. The purpose of this study is to assess potential niche differentiation based on age class structure, spatial distribution, and diet that might explain their persistent sympatry. Backpack electrofishing surveys were conducted in three distinct areas from the headwaters to lower sections of the stream to compare frequency, size and
biomass, and provide specimens for molecular dietary analysis. Trout were anesthetized and gastric lavage was performed to expel stomach contents into filters. Total DNA was extracted from the filters and arthropod-specific primers were used to amplify a small but variable region of the mitochondrial cytochrome c oxidase subunit 1 (COI) region. Amplicons from similar-sized individuals from the same trout species were pooled before being indexed for post-sequence identification. The pooled amplicons were then sequenced using Illumina’s MiSeq, producing over 150,000 sequence reads. The barcodes were compared to the Barcode of Life Database (BOLD) sequence reference library to identify the presence of arthropod species in the diets of these fish. In this study, we describe this novel molecular method for elucidating dietary information and produce evidence for dietary niche partitioning between trout species.

35 **DO POST EXERCISE COMPRESSION GARMENTS REDUCE MUSCLE SORENESS IN ATHLETES?:**

**A CRITICALLY APPRAISED TOPIC**

Stephanie Cherep, Milford SA, Cacolice PA, Scibek J
Junior | Athletic Training | Rangos School of Health Sciences

**Faculty Advisor:** Jason Scibek, Ph.D., LAT, ATC

**A B S T R A C T:**

Objective: Muscle soreness is a common complication among athletes of all activity levels and ages. The purpose of this research was to critically appraise the literature to determine the effects of compression garments (CG) on muscle soreness. Design and Setting: A critically appraised topic design was utilized, starting with a structured PICO question. The PICO question was searched as followed: Population: Athlete OR Adult; Intervention: Compression Garment OR Clothing; Comparison: None; Outcome: Muscle Soreness. The following sources of evidence were utilized: PubMed, Medline, CINAHL, Sports Discus, PEDro Database. Other resources were found through review of reference lists and hand searches. Inclusion criteria included studies measuring creatine kinase as a blood marker for muscle damage, running/sprinting as the exhaustive exercise, English-only articles of Level 3 or higher published within the last ten years, humans only research, and athletes eighteen years or older. Articles consisting of resistive training were excluded. Subjects: Male rugby players, male cricket players, and male and female marathon runners. Measurements: A review of the data in the articles was performed to determine the effects of CG use during and post-exercise on muscle damage and patient reported perceived muscle soreness. Results: None of the four articles meeting the inclusion criteria revealed significant improvements regarding muscle damage. However, there were significant improvements in perceived muscle soreness for subjects wearing CG. Conclusion: While CG may not positively impact biomarkers associated with muscle damage, CG provide a placebo effect, that results in reduced soreness and the potential for improved performance.

36 **Education as a Tool of an Empire: American Indian Education**

Margaret Long
Senior | History & Secondary Education - Social Studies | McAnulty College and Graduate School of
Liberal Arts
Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT:

Education as a Tool of Empire explores the use of education by imperialists to control the flow of information and create culture gaps, or a loss or change of traditions resulting in a lack of communication between two generations, within a group of people who are being assimilated into the dominant culture. The relationship between the United States’ government and the American Indian serves as an example because compulsory education was used to try to assimilate the American Indian into the spreading white culture as the United States continued to expand westward during the 1800s. In order to support this example, Education as a Tool of Empire examines primary sources, such as newspaper articles and statements made by government officials and federal laws, as well as first hand accounts offered by American Indians to show the rationale for and effects of this compulsory education. This research contributes to our understanding of how imperialists spread their culture when creating empires, and why education is such a powerful tool of empire building. Additionally, this argument is important because it exhibits the various aspects of utilizing education as a tool of an empire and illustrates how controlling the flow of information to select members of a society can shape the minds of the society as a whole for many generations to come.

37 EFFECT OF SERUM ELECTROLYTE LEVELS ON EXERCISE ASSOCIATED MUSCLE CRAMPS: A CRITICALLY APPRAISED TOPIC

Hope Tiezzi, Marissa Pazik
Junior | Athletic Training | Rangos School of Health Sciences
Faculty Advisor: Paul Cacolice, Ph.D.

ABSTRACT:

Context: Exercise Associate Muscle Cramps (EAMC) is a common problem in endurance athletes. The preferred strategy to optimize performance is to prevent EAMCs. Hydration with electrolyte is one common clinical strategy to manage EAMC. Objective: The purpose of this Critically Appraised Topic (CAT) is to address the affect of serum electrolyte levels on EAMC. Design: This CAT was conducted using a PICO search strategy of P: (endurance AND athlete) OR active individual, I: Serum Electrolyte levels, C: no intervention OR control, O: exercise associated muscular cramps. The PICO was searched in PubMed, CINAHL, Cochrane Library, and PEDro databases. Inclusion criteria were for English-language articles published in the last 15 years, utilizing only endurance athletes with level of evidence 2 or higher. Exclusion criteria included examining non-endurance athletes, or hydration status without serum electrolyte level quantification. Participant: In the three selected investigations, a cumulative total of 75 EAMC athletes were examined along with 197 non-EAMC athletes. Main outcome measures: Serum electrolyte levels and incidence of EAMC. Results: No significant association between changes in serum electrolyte levels and EAMC, nor any significant changes in pre/post-weight were noted in the participants. All three studies reviewed showed no evidence to support use of hydration with electrolytes to alleviate EAMCs in active individuals. Conclusions: From the findings of this CAT we
conclude that there is no association between serum electrolyte concentrations and EAMC in endurance athletes. Electrolyte usage in rehydrating beverages does not result in decrease incidence of EAMC in this population.

38 Effects of Air Ionization vs. Meditation on State Anxiety
Alexandra Hidalgo, Hunter Ventura
Junior | Psychology and Sociology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Alexander Kranjec, Ph.D.

A B S T R A C T:
It would be useful to have a simple, natural way to decrease anxiety –like before a difficult test. Previous studies have shown that air ionization may cause decreased levels in state anxiety. However, results from these studies has been mixed, and few use principled comparison conditions. The present study tests the effects of a commercial air ionizer on levels of state anxiety as compared to a group led on a guided meditation and a baseline control group. Participants in each group will complete a state anxiety survey at the beginning and end of each session. During each session, all participants will complete a number of word searches. We are interested in the extent that air ionization has anti-anxiety producing effects in comparison to meditation and the control. If the use of the commercial air ionizer causes a decrease in state anxiety it may suggest new and relatively easy ways to decrease anxiety in stressful environments.

39 Effects of Macromolecular Crowding on Ferredoxin and Ferredoxin-NADP+ Reductase Enzyme Kinetics
Danielle Bautista, David W. Seybert, Ph.D.
Junior | Chemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: David Seybert, Ph.D.

A B S T R A C T:
Macromolecular crowding refers to the intrinsic occurrence of high concentrations of macromolecules found within cells, which may alter biomolecular properties of other macromolecules. Simulating these environments in vitro should enable a more accurate understanding of these alterations. We have employed in vitro studies to specifically examine the effects of macromolecular crowding on biological redox reactions.

The iron-sulfur protein ferredoxin (Fdx) and the FAD-containing flavoprotein ferredoxin-NADP+ reductase (FNR), from Spinacea oleracea, were utilized as a model electron transfer system. Utilizing NADPH as a reductant, the Fdx-FNR complex reduces mammalian cytochrome c as a surrogate electron acceptor. Due to properties in cytochrome c the kinetics of this reaction is monitored at 550nm. We have focused our attention primarily on bovine serum albumin (BSA) as a model macromolecular crowding agent at concentrations up to 20%. Under these conditions, the rate of cytochrome c reduction displays hyperbolic kinetics with respect to Fdx concentration. Initial experiments utilizing 10% BSA resulted in a 70% reduction in the electron transfer rate, whereas lower BSA concentrations
showed evidence of stimulatory effects. Therefore suggesting these crowding effects on reduction kinetics may be nonlinear. We will report the Fdx concentration dependence of cytochrome c reduction rates as a function of BSA concentration. In related experiments, we have also examined viscosity effects with this system to determine the effects of changes in diffusion rates on the kinetics of electron transfer.

40 **Perspective Progress: Interpreting Redevelopment Efforts Within The Hill District of Pittsburgh**

Peter Mysels  
Senior | Secondary Social Studies Education | School of Education  
Faculty Advisor: Andrew Simpson, Ph.D.

**ABSTRACT:**  
Since the 1930s, the growing physical and economic decline within The Hill District has made the five connecting neighborhoods a prime target of redevelopment in the greater Pittsburgh area. City leaders have pushed to morph the districts into a commercial area for Pittsburgh with proposals to construct highways, shopping malls, sports arenas, and other urban developments. Residents of the area often take issue to these modern establishments, as past examples have shown how homes and businesses have been leveled in the process. Residents instead state funding should be focused on reviving The Hill through internal improvements such as transportation, police effectiveness, and access to healthy food. Decades of disputes regarding appropriate funding and support for either local or public redevelopment efforts has left The Hill at an economic standstill. The lack of enduring redevelopment within The Hill District stems from the clash between residents and urban planners due to either party’s perspective manner in which to repair the community, a decline in the availability of quality, less-expensive housing, and a shortage in support for allocated funding for local renewal efforts. Perspective Progress presents the theme of redevelopment through two clashing lenses: the native community members versus urban planners. Policy recommendations from a local organization located in the heart of The Hill bring this paper to a close, allowing the reader to ascertain the decades of hardship plaguing the community and learn what modern efforts are being made to achieve lasting growth for both the people and businesses of The Hill District.

41 **Effects of Viscosity and Macromolecular Crowding on the Diffusion-Controlled Rate Constant of Ferredoxin with Ferredoxin NADP+ Reductase**

Sarah Sweger  
Junior | Chemistry | Bayer School of Natural and Environmental Sciences  
Faculty Advisor: Jeffry Madura, Ph.D.

**ABSTRACT:**  
The rate at which many reactions occur is controlled by the ability of one particle to diffuse to another. One such reaction is the protein-protein association between ferredoxin NADP+ reductase (FNR) and ferredoxin (Fd), a key mechanism in the overall process of photosynthesis. Experiments simulating the
intracellular environment often neglect to include the high concentration of macromolecules within the cytosol of the cell. The presence of these macromolecules causes a crowding effect impacting the rate at which reactions occur within the cell. Utilizing the methods of Brownian dynamics, simulations were run to calculate the reaction rate of the ferredoxin NADP+ reductase enzyme binding with a corresponding ferredoxin molecule under standard conditions as well as conditions including macromolecular crowding. The resulting data indicated that the diffusion-controlled rate of the reaction was reduced when introduced to crowded conditions. The results indicate a greater understanding of the interactions occurring using a realistic model of the intracellular environment.

42 Electronic Cigarettes: The Perceptions of Pharmacists and Physicians
Alana Grabigel, Dominick DiLucente, PharmD Candidate 2017 and Lauren Wolfe, PharmD
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Jamie McConaha, PharmD, CGP, BCACP

ABSTRACT:
Introduction: Electronic cigarettes, also known as e-cigarettes, are electronic nicotine delivery systems that have been increasing in popularity in recent years. While many manufacturers of e-cigarettes advertise their product as a smoking cessation aid, there is insufficient evidence to support this claim. The long-term health outcomes associated with e-cigarette use remain unknown.

Objectives: This study aims to evaluate pharmacists’ and physicians’ perception and knowledge of e-cigarettes. The study will also assess if, and to what extent, patient e-cigarette usage is collected as a marker of tobacco use status.

Study Design: This study employs a cross-sectional survey distributed to two separate focus groups: pharmacists and physicians. Information collected from pharmacist and physician survey responses will be analyzed utilizing descriptive and inferential statistics, as appropriate.

Methods: This study utilizes a survey methodology. Pharmacists practicing in the community pharmacy setting and physicians practicing in family medicine are the targeted subjects. The timeframe for survey distribution will be a period of 3 months or until 100 surveys are collected from each focus group.

Results: Based on preliminary results, pharmacists and physicians will benefit from further information on e-cigarettes. Pharmacists feel only slightly confident or not confident at all on counseling patients about e-cigarettes. Mixed results have been gathered on whether e-cigarettes may be used as an effective smoking cessation tool. Data collection is ongoing with anticipated completion in March 2016.

Conclusion: Pharmacists and physicians will be called upon to serve as informational resources and care providers for patients who use them. This proactive assessment highlights the upward trend in e-cigarette use and enhances patient care by presenting the topic in a forum that provides pharmacists and physicians the opportunity to become more familiar with e-cigarettes.
43 Erythema Multiforme Minor in a Collegiate Football Player with Diabetes
Katelyn Karpoff, Sarah Manspeaker, Amber Herr
Senior | Athletic Training | Rangos School of Health Sciences
Faculty Advisor: Sarah Manspeaker, Ph.D., ATC

ABSTRACT:
Background: A 19-year-old male, Division I, collegiate football player presented with erythematous, umbilicated lesions across his chest, back, arms, and mouth that had been present for 36 hours. These lesions were itchy and bothersome during activities of daily life and football participation. He has a known previous history of Varicella zoster, Herpes Simplex I (HSV I), and Type I Diabetes. Differential Diagnosis: Varicella zoster, HSV I outbreak, EM minor, and EM major. Treatment: Diagnostic evaluation included dermatological assessment that led to a diagnosis of EM minor within 72 hours of presentation of signs/symptoms. The patient was prescribed Prednisone to decrease inflammation of the lesions, and Valacyclovir as a precaution to prevent the worsening or recurrence of an HSV outbreak. He was prohibited from physical activity for four weeks including practice, competition, workouts, lifting, and rehabilitation for injuries. Three weeks post-diagnosis, he was seen by his personal physician who determined the lesions had scarred and healed and was subsequently cleared for physical activity and return to football. Uniqueness: This case proved difficult to diagnose as EM is a rare condition affecting less than one percent of the population and there were issues in treating due to the pre-existing condition of diabetes. The athlete was given Prednisone however, he experienced side effects in the form of fluctuating glucose levels that were difficult to control. Conclusions: This case highlights the importance of athletic trainers’ understanding of dermatology, pharmacological treatment options, comorbidities, and gaining a thorough past medical history for all athletes. Word Count: 248

44 Evaluation of appropriateness of vaccination procedures of the 13-valent pneumococcal conjugate vaccine and the 23-valent pneumococcal polysaccharide vaccine in a hospital setting.
Sabina Vaichys, Paige Coleman, Matthew Sears, Branden Nemecek, Anthony Guarascio
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Branden Nemecek, PharmD

ABSTRACT:
Purpose: Immunocompromised patients have an increased risk of pneumococcal disease. The CDC Advisory Committee on Immunization Practices (ACIP) recommends use of the 13-valent pneumococcal conjugate vaccine (PCV13) for immunocompromised adult patients at the next vaccination opportunity followed by the 23-valent pneumococcal polysaccharide vaccine (PPSV23) 8 weeks later. Vaccination in the inpatient setting often requires assessment of comorbidities and vaccination history, which may be absent or incomplete. The purpose of this study is to evaluate current utilization of the PCV13 and PPSV23 vaccines and identify opportunities for optimization of patient care.
Methods: This is a retrospective cohort study evaluating pneumococcal vaccine use within an academic medical center. Included patients are adults 18 years of age or older, admitted from April 1, 2012 to April 1, 2015 who received a pneumococcal vaccine (either PCV13 or PPSV23). Patients were evaluated to determine if vaccination practices were performed in accordance with current ACIP guidelines.

Results: Inclusion criteria identified 4,349 patients who received a pneumococcal vaccine. Of these patients, 134 received PCV13 and 4,215 received PPSV23. Initial results demonstrate that 10.8% of patients received the PPSV23 without a documented indication for the vaccine according to ACIP recommendations. No patients currently assessed have received the PPSV23 within 8 weeks of receiving the PCV13. The most common indications for vaccination to date included age 65 or older (49%), current smoker (41%), and diabetes (18%), while 42 (57%) patients had multiple indications for vaccination. Completion of the full data collection and analysis are anticipated prior to the poster presentation.

Conclusions: Appropriate pneumococcal vaccination was provided according to vaccine indication approximately 90% of the time, while new recommendations for PCV13 administration at next vaccination opportunity were followed in less than 5% of vaccinations. These findings indicate need for vaccination process development as well as improved vaccination documentation practices.

45 Evaluation of Flow Rate and Discharge at Wingfield Pines
Samuel Lehr
Senior | Environmental Science | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Ed Schroth, M.S.

A B S T R A C T:
Wingfield Pines is an abandoned mine drainage remediation site located near Pittsburgh, PA. As water flows through a series of ponds, harmful iron precipitates are removed from the water before it enters nearby Chartiers Creek. The process of iron removal is highly dependent on the rate of flow, as sufficient time is needed for the iron to be captured within the system. This experiment involved the measurement of flow on 5 different occasions using a flow meter. It was found that the rate of flow during winter months was greater, presumably due to lack of vegetation and increased activity of muskrats in the area. This increased level of flow will result in higher levels of iron in Chartiers Creek during winter months, creating a water pollution-based problem.

46 Evaluation of the impact of pharmacist-run tobacco cessation classes on abstinence rates in patients of a Patient-Centered Medical Home (PCMH) practice
Angela Raymond, Lauren Wolfe, Pharm.D., Gibbs Kanyongo, Ph.D.
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Jamie McConaha, Pharm.D.

A B S T R A C T:
Introduction: Over fifty years have passed since the Surgeon General’s Advisory Committee report on smoking and health. Even with the resulting decline in cigarette smoking from 42% in 1965 to 18% in
2012, over 42 million Americans still smoke. Guidelines explicitly advocate for the combined use of counseling and medication(s) as the most effective means to improve cessation rates. This study evaluates abstinence rates of patients in a PCMH that attended pharmacist-led tobacco cessation classes in conjunction with tobacco cessation medications compared to those who utilized the same medications but didn’t attend classes.

Methods:

Patients were recruited from a PCMH in Pittsburgh, PA. Patients with a documented active smoking status in the electronic medical record (EMR) beginning July 2013 were invited to a pharmacist-led tobacco cessation class. Study inclusion criteria for the intervention group included the use of nicotine replacement treatment (NRT), bupropion or varenicline, and attendance in at least 80% of the classes. An EMR report was used to identify patients for the control group who utilized NRT during the same timeframe but didn’t attend the class. Using a standardized script, tobacco abstinence rates in both the control and intervention groups will be assessed telephonically at 2, 4, 12, and 24 weeks following treatment. Results will be evaluated using descriptive statistics.

Preliminary Results:

Telephonic follow-up calls to both groups are being conducted, and dependent upon agreement to enroll in the study, the anticipated final sample size is 80. Data collection continues through April 2016 to meet specified follow-up times.

47 Examination of the LCST and hydration properties of PNIPAM and its substituents from molecular dynamics simulations

Madeline Galbraith
Sophomore | Physics and Computer Science | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jeffry Madura, Ph.D.

A B S T R A C T:
The thermo-responsive polymer poly(n-isopropylacrylamide), PNIPAM, undergoes a conformational transition at the lower critical solution temperature (LCST) making it ideal for applications involving temperature regulated volume changes, such as drug delivery and tissue engineering. Enthalpic contributions of the amide groups stabilize the polymer in the elongated state below the LCST. Conversely, above the LCST the entropic contributions from hydrophobic interactions stabilize the collapsed state. The LCST and hydration properties can be modified by substituting the isopropyl groups with other alkyl groups – methyl, ethyl, and tert-butyl. The molecular-level interactions of PNIPAM and its substituents responsible for this behavior were studied using molecular dynamics simulations. The hydration properties, for instance the partial molar volume, of PNIPAM and its substituents were analyzed using geometric algorithms, such as Voronoi polyhedra. The hydration of PNIPAM and its substituents decreased above the LCST compared to below the LCST, while the partial molar volume and molecular volume increased. The LCST decreased with the bulkier alkyl substitution while the LCST of
the less bulky alkyl substitutions had no clear trend. Furthermore, PNIPAM with the ethyl substituent behaved similarly to PNIPAM whereas PNIPAM with the methyl substitutions tended to have smaller volumes than PNIPAM and PNIPAM with the t-butyl substitutions acted oppositely compared with the methyl substituent.

48 Exploring the Adaptations of Bobcats to Diverse Ecosystems by Identifying Genomic Regions under Selection
Sarah Sprauer, Jennifer C. Broderick, Imogene Davis, Roberta K. Newbury, Ph.D., William Horne, and Jan E. Janecka, Ph.D.
Senior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jan Janecka, Ph.D.

A B S T R A C T:
The bobcat (Lynx rufus) is one of the most successful carnivores in North America. As a generalist, the bobcat thrives in diverse environments and has broad prey use. Our objective is to examine local adaptations of bobcats in different regions of the US through genomic analysis and contrast it with the specialist, Canada lynx (Lynx canadensis). Double digest restriction site associated DNA sequencing (RADseq) libraries were prepared in 17 bobcat samples from 3 populations (New Mexico, Montana, Vermont) for Illumina sequencing on a MiSeq, HiSeq, and NextSeq using modified methods of Elshire et al. (2011) and Peterson et al. (2012). Reads were mapped to the domestic cat genome and mapped and non-mapped reads were used to construct a catalog of potential loci distributed across the entire genome. The reads mapped evenly to all chromosomes and yielded genotypes for 17,196 loci were shared across >50% of the samples. The pairwise AMOVA FST between eastern and western bobcat populations was 0.063, and between norther and southern bobcat populations was 0.042. Vermont harbored the most divergent bobcat populations. When bobcats and Canada lynx were compared the AMOVA FST was 0.273. The genotyped loci were used to reconstruct haplotypes, and the ones with outlier Fst and gene diversity values were identified as potentially located on chromosomal regions that have been under strong selection pressures. We are currently expanding our population sample sizes and genome coverage based on this data in order to identify genomic differences that may be driving inter and intra-species adaptations.

49 Genetic variation at the relaxin 2 (RLN2) promoter in humans, and its effect on gene expression
Rachel Zapf, Taylor Pollock, Sarah Carnahan-Craig, Michael Jensen-Seaman, Ph.D.
Senior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Michael Jensen-Seaman, Ph.D.

A B S T R A C T:
Relaxin is a peptide hormone primarily released by the ovaries that is involved mainly with childbirth. Increased levels of relaxin have been found to increase the risk of preterm labor, which can compromise the health of newborns. Genetic association studies have recently linked a single nucleotide
polymorphism (SNP rs3758239) located on chromosome 9 in the putative RLN2 promoter wa
an increased risk of preterm birth. Additionally, a nearby microsatellite repeat is highly variable in humans. Our project aims to discover the range of genetic diversity of this relaxin promoter in humans and quantify the differences in the level of relaxin transcription among these human haplotypes. We have already undertaken characterizing the haplotype variation in a sample of 44 humans via PCR and sequencing. We then plan to analyze these data via fluorescent fragment size analysis. With the variations characterized in the SNP and microsatellite repeat, we will test the hypothesis that these allelic variations modulate expression differences of RLN2. To do this, we will clone up to ten common human haplotypes into a vector which promotes luciferase production, to measure levels of transcription. Then, these constructs will be transfected into a human trophoblast cell line, luciferase activity measured, and differences analyzed via ANOVA. Overall, analyzing the genetic basis for differences in RLN2 regulation can help determine how relaxin is controlled during pregnancy, which has been shown to have an impact on the likelihood of preterm birth.

50 Global Warming versus Lake Okeechobee
Christina Damico
Sophomore | Physician Assistant | Rangos School of Health Sciences
Faculty Advisor: Michael Irwin, Ph. D

ABSTRACT:
Global warming, more generally known as climate change, is a devastating reality we are currently facing. The National Aeronautics and Space Administration provides data that supports the claim that temperatures globally are increasing, and have been since data collection began in 1880. The results of climate change are vast and destructive directly and indirectly to environments and habitats of all kinds. Warmer waters affect marine life, hot summers scorch crops, shorter springs disrupt hibernating animals and insects, droughts leave the ground bare and prone to wildfires, melting glaciers eliminate homes of polar bears, and changing wind patterns cause nastier storms. Another devastating consequence of global warming is flooding. Sea levels are rising while ice caps are melting. More and more water is being added to the environment. Homes once along the bank of a river are forced yards back and threatened by rising water levels. A current example of the damaging effects of flooding due to global warming is Lake Okeechobee. Lake Okeechobee is an inland lake located in southern Florida that is home to aging dike, a dump for factories, and is well over-flowed. Lake Okeechobee is in the news because of the flooding, and the solutions being deliberated. The resolution with highest hopes is expelling the water to go through the rivers and streams and to the coastal estuaries. In this scenario the water drains from the lake at 70,000 gallons per second and will end up in the Atlantic Ocean and Gulf of Mexico.
51 Graphical analysis of repeated measures (Longitudinal) data arising in randomized control trials

James Matuk
Senior | Mathematics | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Frank D’Amico, Ph.D.

Abstract:
Introduction: The defining characteristic of a longitudinal study is that individuals are measured repeatedly through time. This is in contrast to cross-sectional studies where individuals are usually only measured once. The defining feature of a longitudinal data set is that repeated observations on individuals allow the direct study of change. Longitudinal data analyses requires special statistical methods because the set of repeated observations on one subject tend to be inter-correlated. This correlation must be taken into account to draw valid conclusions.

Objective: The goal of this presentation is to show using vivid graphical illustrations how the results can elegantly portrayed by incorporating the correlation into the analysis.

Methods: The process to achieve the objective is to show five separate examples of repeated measures correlated data. The examples will go from simple to complex. The simplest case is a single group of subjects measured at two time points. The next case is also a single group measured at two time points, except the data is broken into two categories. The third example is a single group measured at multiple time points where the correlation across the time points is significant. The fourth and fifth examples show how we can compare multiple groups across multiple time points.

Conclusion: Properly incorporating the correlation into the analyses can remarkably and visually demonstrate patterns and changes over time. Not handling the correlation completely blurs the patterns and leads to an incorrect conclusion.

*52 How Much Is Enough? Financial Institutions And Anti-Money Laundering Regulation

Brian D’Orazio
Senior | Economics, Mathematics | A.J. Palumbo School of Business Administration
Faculty Advisor: Kevin Shaver, Ph.D.

Abstract:
Research on the relationship between financial institutions and government anti-money laundering regulation is largely nonexistent. The Bank Secrecy Act and U.S. Patriot Act require financial institutions to aid the government in identifying laundered money. This paper develops a theoretical model that explores the welfare impact of anti-money laundering regulation.

The model consists of a continuum of depositors, a representative financial institution, and a government. The government sets penalties for the financial institution, which consist of non-compliance with regulation and false negatives, and sets thresholds for each of the bank’s reporting measures to ensure the bank is meeting government requirements. Given the government’s regulations, the financial institution utilizes customer due diligence and pattern recognition to determine which depositors to report as potential launderers. The government enforcement costs also impact depositor
income and financial institution revenues. A subgame perfect Nash equilibrium is found using backwards induction.

53 Human Trafficking from a Social Justice Perspective
Lauren Zawatski, Rachel Poole
Sophomore | Multiplatform Journalism | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Elizabeth Cochran, Ph.D.

Abstract:
Currently, there are 27 million people worldwide who are enslaved; this number of people held captive by human trafficking continues to grow each day. Our research focuses on the issue of human trafficking, specifically in the United States. We examine the effectiveness of U.S. laws on the regulation and elimination of sexual trafficking. This research gives a starting point for addressing human trafficking distinctly from a social justice perspective. We analyze why this issue has become so widespread and destructive, what its implications mean for promoting social justice and what a Catholic insight of social justice adds to our reflection on the morality of sex trafficking. While some religious and philosophical traditions would contend that sex trafficking is morally wrong as a human consent violation, we attest that Catholic social teaching gives more comprehensive reasons for renouncing human trafficking. Social justice from a Catholic Social Teaching standpoint demands dignity for every human person, each of whom is made in the image of God. Major sources for our research include Margaret Farley, Martha Nussbaum and select papal encyclicals.

54 Image Fusion Using SURE-Guided Piecewise Linear Estimation
Justin Goodwill
Junior | Binary Engineering | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Stacey Levine, Ph.D.

Abstract:
In recent years, a number of image processing algorithms have employed the Gaussian mixture model (GMM) as a probabilistic patch-based paradigm for data classification and signal estimation, achieving near state-of-the art results. Yu, Sapiro, and Mallat developed a general framework for solving inverse problems through the connection that the Weiner filter estimation of an image patch from a GMM is precisely equivalent to sparsely representing an image patch using an structured over-complete PCA dictionary. Wang and Morel expanded upon this work by developing a piecewise linear estimation (S-PLE) using a flexible Bayesian Gaussian factor model and a SURE (Stein’s unbiased risk estimator) guided statistical filter selection. In light of Wang and Morel’s results for single image denoising, we show how the S-PLE formulation can be adapted for fusing multiple images that have been corrupted by additive Gaussian noise.
55 Incorporating Parcel Transportation Costs into Lot Sizing Decisions
Adam Wenger
Senior | Supply Chain Management & Information Systems Management | A.J. Palumbo School of Business Administration
Faculty Advisor: Matt Drake, Ph.D., CFPIM, CPF

Abstract:
The original economic order quantity (EOQ) model for determining lot sizes was published by Ford Harris in 1913. For the past century, researchers have created and studied variants of the model, spanning almost every possible field and business scenario. One consideration that has been left relatively untouched has been the inclusion of parcel transportation costs. When a business needs to transport products in batches weighing less than 150 pounds, they usually turn to either FedEx or UPS. There is a variable cost of doing so, dictated most significantly by the weight of the package and the distance the package is traveling (categorized into “zones”). The basic EOQ model is used to determine the optimal batch size (Q*) based on annual demand, ordering cost, and the holding cost rate. The optimal Q* minimizes the total annual logistics cost within the scope of the model. But when the ordering cost changes relative to the size of Q*, we must extend the original EOQ model to account for this variation. Using 2016 parcel rate tables for FedEx and UPS, we developed a variant of the EOQ model that accounts for the quantity-dependent parcel shipment cost. Using this model, a company sending a small, high value product across a dedicated lane would be able to determine the optimal number of units to include in each parcel shipment to minimize the overall total annual logistics cost.

56 Instagram Usage & Body Dissatisfaction
Rachel Fyalkowski
Junior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Lori Koelsch, Ph.D.

Abstract:
Sociocultural standards of feminine beauty are presented in every form of popular media, smacking images of the “ideal body” in women’s faces. The emergence of technology—especially social media—allows females to see the social “norm” not just on a daily basis, but an hourly basis. This overwhelming amount of exposure can lead young girls an abundance of problems, such as negative body image.

Past research has concluded that, due to media influence, women are not satisfied with their bodies. Although there are various studies investigating the correlation between social media and body dissatisfaction, there is a lack of research involving Instagram specifically. Since Instagram is becoming a widely used and popular site, it seems significant to look at the relationship between body image and Instagram usage, particularly. Not only am I interested in the potential correlation between Instagram usage and body dissatisfaction; but also, the individual’s perception of herself compared to other females, comparatively.
My research study is a questionnaire consisting of three parts—Instagram usage, body dissatisfaction, and self-perception—to see the strength of the relationship between Instagram usage and body dissatisfaction. The main goals of the project involve using this data to spread awareness of society’s impact, through Instagram, of body standards while helping empower young women to change the way they see themselves and others for the better.

57 Interprofessional Education Ethics Workshop

Morgan Ricker, Caryssa McCool
Senior | Speech Language Pathology | Rangos School of Health Sciences
Faculty Advisor: Sarah Wallace, CCC-SLP, Ph.D.

ABSTRACT:
Interprofessional Education (IPE) is a practice whereby multiple health professionals have an opportunity to collaborate with the goal of improving the overall communication and ultimately enhancing patient outcomes (World Health Organization).

216 students completed a 4-hour IPE Ethics Workshop as part of their enrollment in one of six degree programs. The researchers formed 20 groups. The students were also asked to complete a pre- and post-workshop survey, as well as a post-workshop reflection.

Student responses to the three reflection questions fell into four main themes or domains: Experience, Core Competencies, Scope, and Approach. Subdomains indicated that students reported a lack of experience with ethical dilemmas or the influence of personal experience (e.g., family, beliefs and values, and academic experience). Additionally, students reflected on learning related to the core competencies (i.e., communication, ethics, teamwork, and role) and the long term influence of their actions. Finally, students stated that as a result of the workshop they would change their behavior, be more mindful, and integrate multiple viewpoints in the future.

58 Investigating the Empirical Aesthetics of Poetic Language

Sara Boothe, Elizabeth Mance
Senior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Alexander Kranjec, Ph.D.

ABSTRACT:
The present research investigates the extent to which poets with different levels of experience (and perhaps success) use different kinds of words, using conventional psycholinguistic variables to measure these differences. The study compares words from amateur and professional poems. In the first norming phase, participants will read selected poems and rate them for their valence (positive or negative). This normative study (Experiment 1) will first be done to select 2 ‘positive’ and 2 ‘negative’ poems for each the amateur and professional categories. Using the results from this norming, the 2 most ‘positive’ and ‘negative’ poems (as well as the 2 most average control group text selections taken from technical manuals) will be selected for each group. In Experiment 2, a different group of
participants will independently rank individual words for beauty and valence in a randomized list taken from all three groups. The participants will rate each word for beauty and valence on a scale of 1-5. We seek to understand if professional poets choose words that are more beautiful, independent of context and meaning, as compared to their amateur counterparts.

59 Investigation of the therapeutic potential of N-acetyl cysteine and the tools used to define nigrostriatal degeneration in vivo
Jimin Han, Negin Nouraei, Lauren Zarger, Justin N. Weilnau, Daniel M. Mason, Rehana K. Leak
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Rehana Leak, Ph.D.

Abstract:
The glutathione precursor N-acetyl-l-cysteine (NAC) is currently being tested on Parkinson's patients for its neuroprotective properties. Our studies have shown that NAC can elicit protection in glutathione-independent manners in vitro. Thus, the goal of the present study was to establish an animal model of NAC-mediated protection in which to dissect the underlying mechanism. Mice were infused intrastriatally with the oxidative neurotoxicant 6-hydroxydopamine (6-OHDA; 4 μg) and administered NAC intraperitoneally (100 mg/kg). NAC-treated animals exhibited higher levels of the dopaminergic terminal marker tyrosine hydroxylase (TH) in the striatum 10d after 6-OHDA. As TH expression is subject to stress-induced modulation, we infused the tracer FluoroGold into the striatum to retrogradely label nigrostriatal projection neurons. As expected, nigral FluoroGold staining and cell counts of FluoroGold+ profiles were both more sensitive measures of nigrostriatal degeneration than measurements relying on TH alone. However, NAC failed to protect dopaminergic neurons 3 weeks following 6-OHDA, an effect verified by four measures: striatal TH levels, nigral TH levels, nigral TH+ cell counts, and nigral FluoroGold levels. Some degree of mild toxicity of FluoroGold and NAC was evident, suggesting that caution must be exercised when relying on FluoroGold as a neuron-counting tool and when designing experiments with long-term delivery of NAC—such as clinical trials on patients with chronic disorders. Finally, the strengths and limitations of the tools used to define nigrostriatal degeneration are discussed.

60 Is Universal Healthcare Universally Better?
Heather Konstanzer
Junior | Nursing | School of Nursing
Faculty Advisor: Cherith Simmer, MS, RN

Abstract:
After partaking in my program abroad, my experience in Spain has called me to question the efficacy of the United States healthcare system. As a Nursing student, I have a vested interest in the future of healthcare and will be dealing with it on a daily basis once I enter the professional world. For my capstone project, I wish to compare the universal care system with Obamacare.
In my preliminary research, I have learned that Spain has one of the top rated healthcare systems—higher than the United States. I wish to investigate their methods for cost management and deliverance of care to determine which system is truly more efficient for delivery of care.

61 Israel vs. Palestine: Why Primordialism Fails
Leo Welsh
Senior | International Relations | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Jennie Schulze, Ph.D.

ABSTRACT:
My initial research question was: Which theory of ethnic conflict best explains the nature of the Israel and Palestinian conflict?

Thesis: Primordialism Fails to explain the Israeli-Palestinian Conflict whereas Social Construction Theory is best to explain this conflict.

I used research on the history of the conflict to set a context. I then present an argument supporting Primordialism (“Constructing Primordialism: Old Histories for New Nations”) authored by Ronald Grigor Suny. I then present research explaining alternative theories to Primordialism, specifically Social Construction as well as some Instrumentalism. I then put all of the theories into the context of the Israeli-Palestinian conflict and explain why Primordialism cannot explain the conflict and its origins and why Social Construction can do so. I finally use my research to help predict where this conflict might be heading in the future.

62 Looking Beyond Face-Value: An Exploration in Gender Inequality and Stereotypes
David DeFelice
Freshman | Political Science | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Matthew Ussia, Ph.D.

ABSTRACT:
The United States and the greater global community face challenges when it comes to gender inequality and stereotyping, specifically for Muslims and women in the United States. To demonstrate why these challenges are matters of importance, the works of author and activist Chimamanda Ngozi Adichie are solicited to provide social commentary on the current culture that produces them. The works used as social commentary are as follows: Purple Hibiscus, We Should All Be Feminists, and The Danger of a Single Story. Adichie’s works will serve as the main identifier of systemic problems in our current culture. Once instances of these cultural challenges are exposed, Adichie’s works are applied in order to identify why they are being carried out and how the cultural injustices can be remedied. Adichie’s social commentary addresses contemporary injustices that are embedded in our culture and why the inequality they create prove to be problematic for a country that prides itself on equality.
*63 Macromolecular Crowding Effects on LDH*
Sadiq Shaik, Caroline Cwalina
Sophomore | Biochemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: David Seybert, Ph.D.

**ABSTRACT:**
Historically, steady-state enzyme kinetics has been studied in vitro using dilute solutions. In reality, enzymatic reactions occur within high concentrations of macromolecules and metabolites. These “crowders” stimulate effects on enzyme kinetics that have yet to be fully examined. To better understand these effects, our group is examining the kinetic behavior of mammalian lactate dehydrogenase (LDH), a cytosolic enzyme that catalyzes the conversion of pyruvate to lactate and the oxidation of NADH to NAD+ as the final step in homolactic fermentation. Flux through this enzyme is significantly increased during the Warburg effect associated with elevated aerobic glycolysis rates in rapidly dividing cells, which include cancerous cells. LDH activity was measured under varying concentrations of Ficoll-70 and bovine serum albumin (BSA) as model crowders. A gradual decrease in activity was concluded relative to control from 0.1-4.0% Ficoll. After 4.0% Ficoll, activity increased slightly (7.0-10.0% Ficoll), but never exceeded the control. Further research has shown that BSA contributes varied substrate effects on LDH activity.

64 Mapping the historical causes of modern heroin addiction in America and the subsequent public health caused by heroin addiction
Michael Findley
Junior | History | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Ralph Pearson, Ph.D.

**ABSTRACT:**
Many regions within United States have seen an unprecedented rise in heroin addiction and without the potential possibility of a decline occurring in the near future, it is important look at the historical events that have contributed to the creation of this situation. The research conducted in this paper creates a historical road map that examines some of the factors that have led to the modern heroin addiction epidemic in the United States such as, over prescription of opiate based painkillers, the transition from pain killer abuse to heroin abuse, the rise in HIV and hepatitis in areas inundated with heroin addiction (especially rural areas) and the subsequent public health concerns that have evolved as the result of heroin addiction. An example of a major public health crisis that occurred in 2015 in rural Indiana which is directly linked to heroin addiction, ties together the public health crisis related to heroin addiction and what can be done to better help facilitate the situation. The desired result of the research in this paper is aimed at attempting to shine light on how we as society reached such a monumental level of heroin addiction and what practical measures need to be taken in order to slow this epidemic.
65 Modeling chronic bladder pain in male and female mice: Exploring the chronicity of repeated cyclophosphamide injections
Abigail Cox, Ms. Katelyn Sadler, Dr. Benedict Kolber
Sophomore | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Benedict Kolber, Ph.D.

A B S T R A C T:
Modeling chronic bladder pain in male and female mice: Exploring the chronicity of repeated cyclophosphamide injections.

Cox, Abigail¹,², Sadler, Katelyn¹,², Kolber, Benedict¹,²
¹Department of Biological Sciences, and ²Chronic Pain Research Consortium
Duquesne University, Pittsburgh, PA

Millions of people in the United States are afflicted with chronic bladder pain syndromes including interstitial cystitis/bladder pain syndrome (IC/BPS) and chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS). IC/BPS and CP/CPPS patients suffer from generalized pelvic pain, frequent urination with a decrease in urine volume, and a persistent urge to urinate in the absence of infection. The etiology of these conditions is undetermined and treatments are limited. To better understand the mechanisms of IC/BPS and CP/CPPS, many animal models have been developed. In one such model, rodents are injected with cyclophosphamide (CYP), a chemotherapeutic drug that causes bladder pain. We are exploring how long the behavioral and physiological effects of this model last. In our experiments, male and female mice were injected with 100mg/kg of CYP every other day for five days. To understand the model’s physiological impacts, we measured the urinary frequency, urinary volume, and body weight before CYP administration, and again at one and seven days following the final administration (i.e. days 6 and 13). Furthermore, we assessed the changes in referred bladder pain across these time points using a mechanical sensitivity test in freely behaving mice. Lastly, we performed histological analysis to determine the effects the injections had on the bladder tissue morphology. Our results suggest that repeated CYP injections induce disease-like symptoms for at least seven days after the final injection. Using this model, we hope to develop a deeper understanding of the neurobiological changes that occur in chronic bladder pain conditions and ultimately reduce patient suffering.

66 Monetary costs of polypharmacy for the treatment of individuals in recovery from chemical dependency
Erica Loadman, Bondi CD, Kamal KM, and Giannetti VJ
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Khalid Kamal, Ph.D.

A B S T R A C T:
The economic burden of chemical dependency on the healthcare system is significant with an estimated annual cost of over $36 billion. Among other social and health issues in individuals with chemical dependency, polypharmacy seems to be common. These individuals may have pre-existing medical
conditions or could develop new conditions after withdrawal from chemical dependency resulting in them being on multiple medications. Thus, polypharmacy is a potential contributor to the economic burden, especially in individuals in recovery from chemical dependency. In the current study, medication data were collected as part of a randomized, double-blind, placebo-controlled trial investigating the effect of melatonin upon post-acute withdrawal among males in a residential treatment program [NCT02431728]. The total number of different medications and the average reported number of expected medications per participant during their 28 days in the study were determined. It was observed that medications affecting the central nervous and cardiovascular systems were the most prescribed in this population. To investigate the monetary impact of polypharmacy, the wholesale acquisition cost (WAC) and average wholesale price (AWP) for the least expensive 1-month supply of the most convenient dosing for the lowest and highest daily dose for each medication was taken from Red Book. Total costs of the lowest and highest daily dose and average cost per participant were calculated for a 1- and 3-month supply. In conclusion, the results of this investigation will increase awareness of the monetary impact of polypharmacy has on the treatment of individuals in recovery from chemical dependency.

67 Music and Fashion under King Louis XIV
Haley Thomas, Junlee Kwon
Junior | Vocal Performance | Mary Pappert School of Music
Faculty Advisor: Jessica Wiskus, Ph.D.

Abstract:
Two topics that are not normally thought to be compared are music and fashion. Fashion, just like music, changes throughout the years, and it mirrors what is going on politically, religiously, and artistically. A time of exciting change in fashion and music was the 17th century baroque period in France. Both music and fashion were under the influence of King Louis the XIVth. Fashion became modeled after his tastes and music was shaped to his desires.

An influential composer of the time was Jean-Baptiste Lully. Lully, as a court composer, adapted opera to please the king; his work serves as the perfect source of comparison to 17th-century French fashion. The results of this comparison are quite interesting. Studying the fashion shows why things evolved and how they related to music. It is interesting to note that 17th-century fashion changed during this period as a way to accommodate the desire that the French Monarchy had for dance; likewise, tragédie lyrique changed from its Italian predecessor to integrate interludes for dancing into the plot and music of the work itself. Lully’s Passacaille mirrors the changes in French Baroque fashion.

Before our research, we had not thought fashion to be even an art form. The research found that it was as much an art as music, dance, or painting. Baroque fashion was a way for anyone to express themselves. This relates dramatically to music. Both of them adjusted their means of expressions to King Louis XIVth’s passion for dancing.
**68 Music Therapy and Prader-Willi Syndrome**

Halley Cole  
Junior | Music Therapy | Mary Pappert School of Music  
Faculty Advisor: Elaine Abbott, Ph.D., MT-BC, FAMI

**ABSTRACT:**
There is currently no research literature on music therapy with individuals with Prader-Willi Syndrome. However, music therapy has been a successful part of the treatment of this genetic disorder on the Prader-Willi Unit at the Children’s Institute in Pittsburgh, PA. This study incorporates a review of the research literature on music therapy with other, similar genetic disorders including Down’s Syndrome, Angelman Syndrome, William’s Syndrome, and Rett Syndrome. A treatment plan was then created for the implementation of music therapy in the treatment of individuals with Prader-Willi Syndrome. The plan emphasizes increasing motivation for movement, decreasing inappropriate behaviors associated with Prader-Willi such as skin-picking and violent outbursts, and increasing productive leisure skills.

*69 Narrative Catalysis: Reading Skeuomorphism in Geoffrey Chaucer’s House of Fame*

Justin Stec  
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Faculty Advisor: Sarah Wright, Ph.D.

**ABSTRACT:**
Is literature truly generative, or can novel works be created through regeneration? In the works of Geoffrey Chaucer, the retelling of classic narratives continually challenges what it means to be an author. In composing his narratives, Chaucer ostensibly “plagiarizes” Greco-Roman classics like Virgil's The Aeneid and Ovid’s Metamorphoses, but in so doing he reimages, reworks, and regenerates these stories in a way that produces space for novel forms of authorship.

My paper, Narrative Catalysis: Reading Skeuomorphism in Chaucer’s The House of Fame, will offer a radically new reading of Chaucer’s The House of Fame, linking authorship, medieval memory practices, and modern digital phenomenon. I will suggest that fundamental similarities exist between medieval memory practices and modern digital memory stimulation practices, which can help a modern reader more thoroughly, understand authorship in the Middle Ages and today. Specifically, I will explore how Chaucer’s skeuomorphic rendering of classic narratives through artwork in The House of Fame affects his characters’ interactions with narrative, and reveals memory’s catalytic effect on novel authorship. I will then explore how this link between memory and novel authorship can help us reimagines the relationship between author and reader in our modern digital society. As the world continues to rethink what it means to be a novel author, we might look to the medieval for clarity, and in doing so see how our literary world may simply be a regeneration of the past.
**70 Novel Combination Melatonin, Estrogen and Progesterone Hormone Therapy on Mammary Gland Differentiation and Breast Cancer**

Erin Browne, Katherine Hilton, Laura Guarinoni, Travis Darveau, Ethan Buszko, Minha Choi, Corry D. Bondi, Mahmud Hasan, and Paula A. Witt-Enderby

Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Paula Witt-Enderby, Ph.D.

**ABSTRACT:**
A novel estrogen (E2)/progesterone (P4) and melatonin (M) hormone therapy (EPMT) was developed to provide menopausal women relief from vasomotor symptoms without increasing their risk of breast cancer (BC). In a previous study that utilized a HER2/neu mouse mammary cancer model, one-year exposure to EPMT increased tumor latency and decreased incidence. The mechanisms underlying these cancer protective actions of EPMT may involve ERK1/2/5 and Runx2. Under normal physiology, these proteins regulate mammary gland differentiation and proliferation; under pathophysiological states, these proteins underlie tumor growth and invasion. The results from past studies demonstrated that EPMT exposure was context-specific—in non-tumor mammary gland, 30-day exposure increased pERK1/2/5 without affecting Runx2 levels while one-year exposure decreased pERK5 but increased Runx2 and pERK1/2 expression—tumors demonstrated decreased ERK1/2 only. Increases in mammary ductal differentiation (i.e., increases in tertiary branching) also occurred in response to 30-day EPMT; increases in tertiary branching are known to be cancer protective because proliferative capacity diminishes. To further investigate the anti-cancer effects of EPMT, proliferation, viability and invasion were assessed in MCF-7 (ER+/PR+), MDA-MB-231(ER-/PR-/HER2-), and MMCs (HER2+/ER-/PR-) BC lines. Twenty-four hour exposure to EPMT decreased cell viability and invasion in MCF-7 and MDA-MB-231 cells but not in MMCs; however, five-day exposure to EPMT decreased cell viability in MMCs. Blockade of MEK1/2 or MEK5 modulated EPMT’s effects on cell viability, proliferation and invasion for all cell lines except MMCs. These data suggest that EPMT is beneficial for the treatment of a wide variety of BCs and further testing is warranted.

**71 On The Existence of Time: The Perspectives of Saint Augustine and Albert Einstein**

Gretchen Pratt
Sophomore | Biomedical Engineering | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Calvin Troup, Ph.D.

**ABSTRACT:**
The concepts of time and eternity are difficult to define, and those philosophers and scientists who have tried have not always agreed. This study seeks to reconcile two theories of time and eternity that at first seem very different—Augustine’s theory of time and eternity as described in his Confessions, and Einstein’s theory of general relativity. Through an exploration of writings about the work of these two academics, this study puts their seemingly different theories into conversation with one another. The most important finding of this study is that these two theories, one primarily philosophical and the other
largely scientific, are actually rather harmonious. The similarities of these two ideas implies the necessity of both science and liberal arts to form a well-rounded education.

72 Optimality Bounds for Recovering Geometric Information in Images
Brady Sheehan
Junior | Mathematics and Computer Science | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Stacey Levine, Ph.D.

Abstract:
Techniques for denoising natural images have seen incredible advances over the past several decades. Recent statistical analyses have shown that these algorithms are approaching optimality with respect to minimum mean squared error when denoising natural images directly. However, it is still not possible to perfectly remove noise from an image and even state of the art algorithms leave visible artifacts. This allows one to question whether mean squared error is the best ‘measure of goodness’. Additionally, some have questioned whether denoising an image directly is the best approach. Rather than denoise an image directly, an increasing number of algorithms have been proposed for denoising geometric features of an image and using this new information to reconstruct a clean image. These approaches open the door to improving other measures of goodness when removing noise from an image. In this work we are studying optimality bounds for denoising geometric features of an image with the hope of discovering if there is more potential for improvement when working within this framework. Finding optimal denoising bounds for this new framework could be a breakthrough that would allow for the development of algorithms that far surpass the state of the art when denoising natural images directly.

73 Optimization of the Diode-Pumped Solid State Nd:YLF Amplifier Chain for the 263 nm Drive Laser at the FAST Facility
Julie Gillis
Senior | Physics | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Theodore Corcovilos, Ph.D.

Abstract:
The RF photoinjector of the 50 MeV superconducting electron linear accelerator at the Fermilab Accelerator Science and Technology (FAST) Facility is driven by a phase-locked laser system. The neodymium-doped yttrium-lithium fluoride (Nd:YLF) seed laser provides short (3 ps) infrared (1053 nm) pulses to an amplifier chain before conversion to ultraviolet (263 nm) through two frequency-doubling β-BaB2O (barium borate) crystals. The amplification section consists of seven diode-pumped solid state (DPSS) amplifiers, which increase the pulse energy of the seed laser using optically end-pumped Nd:YLF crystals. To maximize the total gain of the amplifier chain, each stage must be properly tuned with optimized optics, alignment, and laser beam characterization. In this paper, I report on improvements made to one of the single-pass amplifiers to achieve a consistent gain of 5.09 with stabilized output pulse trains for up to 1500 seed pulses. The ultraviolet pulses imaged onto the Cs2Te photocathode of the RF electron gun have been doubled in energy to 10.97 µJ per pulse as a result of these alterations.
74 p250GAP Messenger RNA Secondary Structure and Poly-U Characterization and Interaction with Fragile X Mental Retardation protein
Allison Williams
Senior | Biochemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Rita Mihailescu, Ph.D.

ABSTRACT:
Messenger RNA p250GAP (p250GAP mRNA) is known to be associated with nerve plasticity in dendrites and has also been shown to be associated with a microRNA called miR132p. p250GAP mRNA has two key regions that demonstrate potential to be associated with fragile X mental retardation protein (FMRP). One section is a G-rich region that forms a secondary structure called a G-quadruplex. These types of structures are known to bind with high affinity and high specificity to FMRP. p250GAP mRNA demonstrates an intramolecular structure that is parallel in nature. This was determined using biophysical techniques such as NMR H1 spectroscopy, CD spectroscopy, UV-Vis spectroscopy, and Native PAGE. The second region is a poly U region. This region also demonstrates the ability to bind to FMRP arginine glycine glycine domain (RGG box) of FMRP. This was determined using a series of Native PAGE gels.

75 Potential Nonlinear Optical Applications for High-Temperature Solid State and Lithium Polysulfide Flux Synthesized Diamond-Like Semiconductors, Li2-II-IV-S4
Ashley Weiland, Jacilynn Brant, Jian-Han Zhang
Junior | Environmental Chemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jennifer Aitken, Ph.D.

ABSTRACT:
Diamond-like semiconductors (DLSs) are of interest due to their compositional flexibility, tunable nature, and potential application in nonlinear optics (NLO), particularly second harmonic generation (SHG) in the infrared. All DLSs possess a noncentrosymmetric crystal structure and are, therefore, potential SHG candidates. The second-order NLO properties of these materials can be tuned in the IR region by using a wide range of predictable compositions. The majority of benchmark IR-NLO materials are DLSs, but quaternary lithium-containing DLSs with the general formula of I2-II-IV-VI4 are not prevalent in literature due to the difficulty in synthesizing phase-pure materials. As a result of selecting lithium as the monovalent ion in DLS materials, the band gap is expected to widen. The wider band gap is anticipated to result in a higher laser damage threshold, which can lead to the possibility for high power NLO applications.

76 Racial Minority Representation in Medicine
Hannah Johnston
Sophomore | Physician Assistant | Rangos School of Health Sciences
Faculty Advisor: Bridget Calhoun, Ph.D.
A B S T R A C T:
Throughout the United States, significant healthcare disparities have been documented in the areas of cardiovascular disease, cancer, diabetes, and HIV infections. Racial minorities appear to be at the greatest disadvantage, thus addressing these disparities is now on the national agenda. Qualitative data from focus groups included in the Institute of Medicine publication entitled, Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare sheds light on the despicable way minority patients are frequently treated in medical environments. Such treatment leads to distrust of the medical establishment in correspondence with potential tension between patient and provider. Statistics regarding the United States workforce in healthcare reveal under-representation of racial minorities among physicians, nurses, physician assistants and pharmacists. Not surprisingly, discordance between patient and provider is considered one contributing factor in the distrust of providers, and bias against minority patients. Nevertheless, there is a great need to diversify the medical staff in the United States to better reflect the changing demographics of the population. Improvements must be made in encouraging racial minorities to pursue medical related professions. By diversifying the workforce, racial disparities in the above mentioned conditions are expected to decline, and the interface between minority representation and medicine can be improved.

*77 Reevaluating Perceptions of Tchaikovsky’s Pathétique Symphony
Jacob Leonowitz
Senior | Music Education | Mary Pappert School of Music
Faculty Advisor: Benjamin Binder, Ph.D.

A B S T R A C T:
Peter Ilyich Tchaikovsky’s Symphony No. 6 in B minor (“Pathétique”) was welcomed only lukewarmly at its 1893 premiere. Among other things, audiences were confused by Tchaikovsky’s atypical choice of a slow and lamenting final movement to conclude the symphony. The mysterious circumstances surrounding Tchaikovsky’s death only days after the Pathétique’s premiere spawned rumors that the composer had committed suicide after years of struggling with his homosexuality. The public consequently embraced the work with new understanding, perceiving it as a “musical suicide note.” Primary sources, however, including the composer’s brother and Xeniya Davydov, provided accounts relating to the end of Tchaikovsky’s life which counter suicide rumors. Nonetheless, the notion of the Pathétique as a funereal, autobiographical melodrama has survived. The musicologist Timothy Jackson argues that the understanding of the work as a “musical suicide note,” and/or tragic narrative about forbidden love influenced later composers such as Rachmaninoff, Mahler, Berg, and Britten, among others. Jackson draws formal, harmonic, and other parallels between the Pathétique and the works of these composers to show how they used compositional techniques from the Pathétique to further their own musical narratives about death, love, and unrequited desires. I argue that these later works intensified an irresistible tendency to perceive the Pathétique as a tragic autobiography, in spite of primary source material indicating Tchaikovsky’s optimism at the time. The progression of music history since the time of the Pathétique’s premiere has made it impossible for us to perceive the work (especially its enigmatic final movement) otherwise.
Reimagining the History of Thought: Drawing Connections Between the Ancient Arts of Rhetoric, Philosophy, and Theology
Eugene Yeo
Senior | Theology/Rhetoric | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: John Rief, Ph.D.

ABSTRACT:
Reimagining the History of Thought: Drawing Connections Between the Ancient Arts of Rhetoric, Philosophy, and Theology

From the foundation of the schools of thought, there has been tension between the schools of Rhetoric and Philosophy. With the addition of a third school, that of Theology, the tension was not lessened, but instead simply added a third direction of pull. It is the intent of this paper to provide a brief argument that the three schools of thought are in fact one field of study examining one subject from three different perspectives. The point of this paper is not to be exhaustive, but to provide a springboard for a much more thorough examination of the subject.

This paper begins by defining the three fields of study in question by noted thinkers in each of those fields: Plato, Aristotle, Isocrates and Aquinas represent their fields, for example. From there, the differences in the fields are considered before moving on to explore the common vein of thought in all three schools of thought. First the core goals of one school are explored, and the others schools are considered as relating to these goals. By determining the core attributes of one school, we are then able to examine the others in light of those attributes. The commonalities are then drawn together and compared with differences, showing the relation of these three disciplines. Finally, the common goals and methods of all three schools are drawn together, and the three are considered as one whole.

The schools of Philosophy, Rhetoric and Theology have long stood in tension. This paper shows that the three work toward a common goal along similar means. The conclusion can thus be drawn that rather than standing in competition with the other fields, members of each should – and already do – draw extensively from them for the betterment of the whole.

Rachel Sweetnich
Senior | Physical Therapy | Rangos School of Health Sciences
Faculty Advisor: Matthew Kostek, Ph.D.

ABSTRACT:
The piriformis muscle is one of six muscles that aids in lateral rotation of the human hip, yet its size is small in comparison to its task. In about 10% of the population, the sciatic nerve becomes compressed by the piriformis muscle. This results in piriformis syndrome, which is characterized by debilitating pain throughout the buttocks, thigh, and/or leg. Due to its size and tendency to cause complications, the
necessity of the piriformis muscle is questionable. Indeed, it is often surgically removed with seemingly no consequences. Although the muscle is not critical in motor function, it may have a proprioceptive role. If so, then the piriformis muscle should have a greater number of muscle spindles compared to muscles of comparable size. The purpose of the present study is to histologically characterize the piriformis muscle. The muscle was extracted from eight human cadavers and subsequently preserved in formaldehyde, embedded in paraffin wax, sectioned, and H&E stained. Using an automated Nikon 90i microscope, mid-belly samples of the muscle were photographed. The NIS-Elements software was then used to perform muscle spindle counts and muscle fiber cross-sectional area measurements. Contrary to our hypothesis, our preliminary data suggests a low muscle spindle count (range: 0-5 muscle spindles per sample, n = 5). The results of this study will have implications for health professionals, such as physicians and physical therapists, in determining appropriate interventions for patients with piriformis syndrome and for those experiencing issues pertaining to lateral rotation of the hip.

*80 Representation Matters: How Representation in Children’s Literature Influences Children of Different Ethnicities
Taylor Cavalovitch
Senior | Early Childhood Education | School of Education
Faculty Advisor: Sandra Quiñones, Ph.D.

**Abstract:**
This action research project explores how the use of representational children’s literature in an elementary classroom might shape the engagement of emergent bilingual students who are underrepresented in the local context. Representational children’s literature is literature that represents students of all backgrounds. Students use this literature as either a window, observing a different perspective, or a mirror, the reader sees himself or herself in the text.

Over a period of three weeks during my literacy field experience in the PreK-4 Leading Teacher program, I focused on one participant: a student of Venezuelan heritage who lives in Pittsburgh. Data collection included pre and post interviews and observations of the student during reading time. The findings suggest that the student had a better focus during the read aloud and comprehension of the text. The finding also suggests that it is easier to form a bond between teacher and student due to showing the student that they are valued in the classroom.

This research supports the use of representational children’s literature in classrooms as a means for connecting with students’ ethnic and cultural backgrounds and increasing student engagement in literacy practices. Recommendations for aspiring teachers will be discussed.

*81 Rioting Gender in Post-Soviet Russia: The Implications of Political and Doctrinal Rhetoric on Human Rights
Kaitlyn Clem
Junior | English | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Elisabeth Vasko, Ph.D.
ABSTRACT:
This research uses the 2012 arrest, prosecution, and religious persecution of radical Russian feminist punk-rock band Pussy Riot by the Russian government in tandem with Russian Orthodox Church Patriarch Kirill as a springboard for an exploration of the implications political and doctrinal rhetoric has had on the current state of traditional gender roles and feminist and LGBTQ progress in post-Soviet Russia. I will suggest that the reinforcement of traditional gender politics and ideologies as defined by Russian Orthodox doctrine is an effort by both the Russian Orthodox Church and the Russian state to protect a regime whose very existence is deeply threatened by the rooting of secularity and Western ideals, both of which are tied to more expansive gender roles. Russian identity, however, continues to fixate upon gender essentialism distinguished by heteronormativity. This creates tension within the Russian socio-religious milieu between the traditionalist rhetoric intended to confine views of gender normativity and bolster Russia’s higher institutions of power, and the Western progressiveness that threatens to undermine the strength of those very same institutions. The government and church’s effort to quell this tension represents a subliminal, silenced human rights violation and a tragic disservice to Russia’s continued progress from the Soviet-era marked by ideological repression.

82 Say Yes to the Dress Goes to Church: A Feminist Theological Analysis of Catholic Marriage Preparation in the Mid-Atlantic Region
Maggie Ballantyne
Senior | Public Relations | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Elisabeth Vasko, Ph.D.

ABSTRACT:
This project explores conventional theology’s take on a bride and her wedding through a feminist Catholic perspective. On the surface of Western culture’s media it is clear that on television shows and in magazines there is a common theme: women are conditioned to strive for a slim, model-esque appearance on their wedding day. Yet Catholic approaches to marriage are rooted in a covenantal theology marked by human dignity and the sanctity of the body. This project examines the practical and theoretical implications of the Roman Catholic theology of marriage within a contemporary context marked by disordered eating and body image. A qualitative analysis of the components of marriage preparation courses offered in the Roman Catholic Diocese of Pittsburgh and Archdiocese of Baltimore in tandem with feminist theological scholarship reveals the need to develop a practical theology of marriage attentive to the issues of female self-esteem in conjunction with body image.

83 Separating Complex DNA Mixtures Containing Related Individuals Using TrueAllele® Mixture Interpretation Software
Olivia Goodwin
Senior | Forensic Science and Law | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Lisa Ludvico, Ph.D.


**ABSTRACT:**
The use of computer technology in the last ten years has successfully simplified DNA mixture interpretation. Complex mixtures limit this new technology, especially when contributors share genetic material as a result of being from the same biological family. This research tests the limits of the continuous probabilistic genotyping software TrueAllele® in order to resolve complex DNA mixtures that contain up to five related individuals. This research proposes that the separation of contributors in a mixture (deconvolution) will result in likelihood ratio (LR) match statistics suitable for court, and that TrueAllele® will be able to generate reproducible results. Buccal swabs will be collected from individuals in three separate families to create single-source profiles. These samples will be extracted using the DNA IQ™ System and quantified using real-time PCR (RT-PCR). Based on family pedigrees and the quantification results, twenty mixtures of two to five contributors will be created using related individuals from those families. After amplification and genotyping, the mixtures will be analyzed using TrueAllele®. This research aims to establish an easier, faster, and reliable analysis of complex mixtures containing multiple related individuals using TrueAllele®. Conclusions from this study will help the forensic science community to establish unbiased, accurate, and precise DNA match statistics for otherwise inconclusive results from complex familial DNA mixtures.

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84 SLP Students’ Perceptions of an IPE Workshop: One-Year Follow Up
Lauren Adler, Mary Flynn
Freshman | Speech and Language Pathology | Rangos School of Health Sciences
Faculty Advisor: Sarah Wallace, Ph.D.

**ABSTRACT:**
Interprofessional Education (IPE) provides important information to healthcare professionals on how to effectively and efficiently work with one another. Most IPE activities integrate the four competency domains including: (1) values/ethics; (2) roles and responsibilities; (3) interprofessional communication; and (4) teamwork. Past follow up questionnaires have analyzed the benefits of IPE; however, a notable absence of speech-language pathology (SLP) students and reflection on the value on the four competency domains exists. Therefore, the study purpose was to examine SLP students’ perceptions of an IPE Workshop after one year of clinical practicum experiences.

The 24 SLP students who participated in the IPE workshop responded to 8 open-ended questions. The researchers identified common themes which typically provided insight on workshop benefits as well as ways the workshop could be improved. For example, although the primary purpose of the workshop was to provide information about other disciplines’ role in stroke care, students also reported learning about collaboration and communication within teams. Additionally, students felt that some aspects of the workshop very particularly value including the opportunity to share SLP-related information, the experience of interacting with a real patient and his family, as well as practicing some teamwork and communication skills needed in the real world. Their feedback provides instructors with insight on what components of IPE may require more attention as well as how to ensure the components are being taught in a way that students can apply them.
85 Structural Analysis of the Serotonin Transporter via Site-Directed Mutagenesis, Crosslinking, and Peptide Mass Fingerprinting

Sara Lutty, Rathna Veeramachaneni, Elizabeth Castellano, Nicholas Ferraro, Zachary Kelley
Senior | Chemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Michael Cascio, Ph.D.

ABSTRACT:
Depression, anxiety disorders, ADHD, and insomnia can result from malfunctions of serotonin transporter (SERT) activity. Other complications arise from drugs of abuse such as inhibition by cocaine and hyperactivity of transport from amphetamines. By investigating SERT, the mechanisms behind the interactions and transport may assist in the development of pharmaceuticals and/or treatments for those affected by its malfunctions. Computational models of SERT have been constructed based on the known crystal structures of the bacterial leucine transporter (LeuT) and the Drosophila dopamine transporter (DAT), but many regions of these transporters remain poorly resolved. To probe SERT structure, three different crosslinkers will be utilized. Methanethiosulfate benzophenone with an alkyne tag will covalently bond to systematically placed cysteine mutations for extracellular protein-protein photocrosslinking. Site-directed mutagenesis was performed on rSERT X8C that will be used for baculovirus overexpression in Sf9 cells. While creating this expression system, hSERT will be purified from TREX after tetracycline induction. A benzophenone derivatized fluoxetine was photocrosslinked in the drug binding site to determine drug-protein crosslinking. To consider lipid interactions, a diazarine phosphatidylcholine was photocrosslinked to SERT to identify lipid-protein photocrosslinks. After trypsinolysis, mass shifted crosslinks were found using quadrupole time-of-flight mass spectrometry (QTOF) with MS/MS to identify specific sites of interactions. The resulting data will be integrated with computational models to refine our model for SERT structure and function.

86 Structural and Electrochemical Investigation of [CuII(Me6TREN)Cl][Cl] Complex in the Presence of Weak Nitrogen Containing Bases

Megan Wasson, Gabrielle Pros
Junior | Chemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Tomislav Pintauer, Ph.D.

ABSTRACT:
Copper-catalyzed atom transfer radical addition (ATRA) is used for C-C bond formation through the addition of alkyl halides across various alkenes. Copper complexes with Me6TREN (tris(2-dimethylaminoethyl)amine ligand are approximately ten times more active than with TPMA (tris(2-pyridylmethyl)amine) due to higher reported KATRA values. However, catalytic studies in ATRA with different alkenes and alkyl halides showed the opposite trend. Reducing agents are typically used to ensure efficient catalyst regeneration which is necessary for ATRA due to unavoidable diffusion controlled radical-radical terminations. The side product of the oxidation of ascorbic acid is the generation of H-X (X=Br or Cl) which protonates the Me6TREN ligand, therefore decreasing its activity. UV/Vis studies of [CuII(Me6TREN)Cl][Cl] in the presence of HCl confirmed decomposition of the copper
complex under such conditions. The optimization of an ATRA study of the addition of CCl₄ across various alkenes catalyzed by [CuII(Me₆TREN)Cl][Cl] confirmed that weak, nitrogen containing bases can inhibit the degradation of the ligand and restore the catalytic activity. However, UV/Vis analysis was necessary to ensure that the inner sphere Cl in the complex was not replaced with the added base. Further UV/Vis studies using [CuII(Me₆TREN)(OTf)₂] (OTf=trifluoromethanesulfonate, a weakly coordinating ligand) and cyclic voltammetry investigations proved that the inner sphere Cl is not replaced. The electrochemical inquiries confirm that the complex maintains its structural integrity when employing base as a means to quench the strong acid formation and the procedure can be effective for ATRA.

87 Student pharmacists’ perceptions and baseline knowledge assessment on the naloxone standing order in community pharmacies

Steven Dufala, Nicole Handlow, Elizabeth Bunk, Pharm.D., Suzanne Higginbotham, BS, Pharm.D., BCACP, Monica L. Skomo, BS, Pharm.D.
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Suzanne Higginbotham, Pharm.D.

ABSTRACT:
Objective: The purpose of this study is to conduct a survey to assess student pharmacists’ perceptions on a naloxone standing order. Opioid-related use is on the rise nationally, contributing to increased overdoses and associated fatalities. Naloxone standing orders are being implemented in areas that are at high risk for fatalities associated with opioid-use. As one of the most accessible health care providers in the community, pharmacists play a critical role in preventing opioid overdoses. As future pharmacists, it is important for student pharmacists to be aware of the standing order and the impact it may have in reducing fatalities.

Methods: Survey methodology will determine the perceptions of student pharmacists on the naloxone standing order, as well as any awareness barriers or lack of knowledge. The focus population will be student pharmacists practicing in community pharmacies in Allegheny County, Pennsylvania, that are currently enrolled at Duquesne University or the University of Pittsburgh. Students will have access to the survey through electronic distribution involving questions attempting to expose attitudes towards the standing order, awareness of recognizing an overdose, and administration knowledge. The results of the survey will be reported through descriptive and inferential statistics.

Preliminary Results: The results of this study will attempt to identify the understanding student pharmacists have regarding the naloxone standing order. By exposing potential gaps in education or barriers present to student pharmacists, the researchers’ intention is to produce an increase in patient safety regarding opioid-related overdoses as future practicing pharmacists with the potential to save countless lives.
88 Student pharmacists’ knowledge, attitudes, and behaviors towards HIV screening
Alvina Tran, Greg Caspero, Michael Steffes, Andrew Mullin
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisors: Autumn Stewart, Pharm.D. and Jordan Covvey, Pharm.D., Ph.D., BCPS

A B S T R A C T:
Human immunodeficiency virus (HIV) is a retrovirus that causes HIV infection and acquired immunodeficiency syndrome (AIDS). It is estimated that over 1.2 million people in the United States over the age of 13 are living with HIV infection, including 156,300 who are unaware of their infection. With such a large population of individuals unaware of their disease, there is a clear need for improvements in the screening of HIV. With proper knowledge of effectively using an HIV test device, pharmacists can play an important counseling role with patients and improve screening in individuals who may be at risk. The study is designed as a cross-sectional electronic survey questionnaire that will assess the knowledge and perceptions among student pharmacists regarding the OraQuick in-home HIV test. The survey link will be distributed through email (using Qualtrics®) to pharmacy students across multiple pharmacy schools in the regional areas of PA, MD, and WV. This research will contribute to the literature regarding HIV in-home test counseling by student pharmacists, as there is a lack of data regarding their attitudes and knowledge of patients with HIV. The results of this study will identify the need for further education in the curriculum of various pharmacy schools regarding the HIV in-home test to increase the rates of HIV screening.

89 Synthesis and Physicochemical Characterization of Narrow-Bandgap Tellurides
Brea Hogan
Junior | Biochemistry / Forensic Science and Law | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jennifer Aitken, Ph.D.

A B S T R A C T:
Thermoelectric generation (TEG) systems utilize energy conversion systems between thermal and electrical energy for both heating/cooling systems and for power generation systems. The efficiency of thermoelectric materials is dependent on the Carnot efficiency and a material’s ability to convert heat into electricity. Thermoelectric material efficiency is defined by the ZT value: \( ZT = (\sigma S^2/\kappa)T \) where electrical conductivity (\( \sigma \)), absolute temperature (\( T \)) and the Seebeck coefficient (\( S \)) are inversely related to \( \kappa \), the total thermal conductivity. Currently, most thermoelectric materials are impeded by a ZT value of approximately 1. The scientific problem within the field of thermoelectrics is to develop efficient materials that possess low thermal conductivity, high electrical conductivity and high Seebeck coefficient values. Quaternary, diamond-like semiconductors such as Cu2ZnGeTe4, Cu2FeGeTe4 and Cu2MnGeTe4 will possess promising properties for thermoelectric applications. The semiconductors are synthesized utilizing high-temperature solid-state techniques, and the purity of the samples are analyzed using X-ray powder diffraction (XRPD) and scanning electron microscopy (SEM) coupled with energy dispersive spectroscopy (EDS). The compounds will then be characterized via differential thermal analysis (DTA) and UV-Vis-NIR data in order to determine the melting temperature and band gaps for
the materials, respectively. Single crystals collected from the samples will be analyzed using single crystal X-ray diffraction to determine the crystal structures.

Thermoelectric generation (TEG) systems utilize energy conversion systems between thermal and electrical energy for both heating/cooling systems and for power generation systems. The efficiency of thermoelectric materials is dependent on the Carnot efficiency and a material’s ability to convert heat into electricity. Thermoelectric material efficiency is defined by the ZT value: $ZT = (\sigma S^2/\kappa)T$ where electrical conductivity ($\sigma$), absolute temperature ($T$) and the Seebeck coefficient ($S$) are inversely related to $\kappa$, the total thermal conductivity. Currently, most thermoelectric materials are impeded by a ZT value of approximately 1. The scientific problem within the field of thermoelectrics is to develop efficient materials that possess low thermal conductivity, high electrical conductivity and high Seebeck coefficient values. Quaternary, diamond-like semiconductors such as Cu2ZnGeTe4, Cu2FeGeTe4 and Cu2MnGeTe4 will possess promising properties for thermoelectric applications. The semiconductors are synthesized utilizing high-temperature solid-state techniques, and the purity of the samples are analyzed using X-ray powder diffraction (XRPD) and scanning electron microscopy (SEM) coupled with energy dispersive spectroscopy (EDS). The compounds will then be characterized via differential thermal analysis (DTA) and UV-Vis-NIR data in order to determine the melting temperature and band gaps for the materials, respectively. Single crystals collected from the samples will be analyzed using single crystal X-ray diffraction to determine the crystal structures.

90 TeleWellness Support Systems for Spinal Cord Injuries

Carly Sullivan, Meredith Karavolis
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Jaime Munoz, Ph. D.

A B S T R A C T:
OBJECTIVE: The purpose of this interdisciplinary study is to understand the usefulness of a mobile health (mHealth) system called iMHere (Interactive Mobile Health and Rehabilitation), in improving self-management skills in adults with spinal cord injury (SCI).

RATIONALE: Individuals with SCI often utilize complex self-management routines to prevent possible complications resulting in hospitalization, death, and expensive medical care. iMHere may support the needs of persons with SCI, as well as increase early detection and treatment of complications.

PARTICIPANTS: Participants are adults with SCIs recruited from University of Pittsburgh Medical Center facilities and community organizations. All participants must be able to use a smartphone.

DESIGN: Participants are randomly assigned to one of two groups. The intervention group receives a smartphone equipped with iMHere to help improve their self-management skills, while the control group receives standard care at an outpatient SCI clinic.
MEASURES: Six assessments are being utilized to collect quantitative data on participant quality of life, level of independence, occupational performance, depression, and quality of care. Assessments are administered at baseline, three, six, and nine months to measure progress.

INTERVENTION: Participants use iMHere to remind themselves of their self-care routines such as self-catheterization, bowel regimens, skin checks, and routine administration of medications. They report success with their activities or new problems and track symptoms of depression. A clinician views the participant’s data through a secure portal. This system alerts the clinician of reported problems through a secure communication system in real time, allowing quick triage and intervention. (Funding Source: Craig H. Neilsen Foundation)

91 The 1990s: an Era of Failed Leadership against Terrorism

Michael D’Orazio
Senior | | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT:

In 1991, the United States and western nations effectively defeated the Soviet Union and Communism following the collapse of the Soviet government and the Berlin Wall ushering a period of economic prosperity. The American economy was adding 1.7 million jobs a year, unemployment fell to low as four percent, the federal budget was balanced with a surplus, and the dotcom boom brought in many new innovations.1 With all this newfound success, the United States failed to confront the new enemy brewing in the Middle East, the terrorist group known as Al-Qaeda. Most Americans never heard of Al-Qaeda until the devastating terrorist attacks on September 11, 2001, but the organization was in full operation throughout the 1990s waging war against the United States. From the bombing of the parking garage inside World Trade Center in 1993, truck bombings at the American Embassies in Kenya and Tanzania in 1998, and the USS Cole attack in 2000, all at the hands of Al-Qaeda. But the failure during the 1990s and the early 21st Century lies in the hands of intelligence officials, leadership from the White House, and the Pentagon. Government officials were more interested under Presidents Clinton and Bush to cut military spending then defending the American people and focus on domestic issues. Following the conclusion of the Cold War, the United States failed the American people by allowing Al-Qaeda to grow in size, funding, and operations in its Jihad against the United States through a series of intelligence, foreign policy, and political missteps.
92 The Applicability of Althusser’s Theories to Harry Potter and the Goblet of Fire
Bethany Parsons
Freshman | Biology & Pre-Medical Professions | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Kathleen Roberts, Ph. D.

ABSTRACT:
Many people enjoy fictional literature. However, can readers still gain an idea of higher level thought concepts if they are present in a story? Readers’ understanding of intellectual concepts is necessary to further propel society. This study examines the applicability of Althusser’s writings on Ideological State Apparatuses to J.K. Rowling’s Harry Potter and the Goblet of Fire. Both Althusser and Rowling’s works were read and annotated for examples that convey higher order issues. These samples were compared and examined using notes and charts. Preliminary results point to Althusser’s ideas of educational, political, and cultural apparatuses used in Harry Potter and the Goblet of Fire. In conclusion, Althusser’s ideas can be applied to Harry Potter and the Goblet of Fire demonstrating the ability of higher level social thinking to be applied to fictional works which indirectly convey the schema of different ideologies to readers, and thus advances societal understanding of intellectual concepts.

93 The Birth of Culturally Responsive Teaching
Laura Stumpf
Freshman | Early Childhood Educations | School of Education
Faculty Advisor: Ralph Pearson, Ph. D

ABSTRACT:
Though an abundance of civil rights movements took place before the eradication of Jim Crow laws, the most influential work in the support of African Americans derives from W. E. B. Du Bois. His influence in the NAACP created the origin of raising awareness of the positive impact African Americans could have on traditional American society if they had the opportunity. However, the developments that he made in the education process of African Americans and the Africana culture creates progress in the American education system. These scholarly and cultural advancements closely paralleled the pedagogy of Paulo Friere, indicating the relevance and necessity of diverse teaching. Such beliefs created a new outlook of African Americans, changing the thoughts on cultural perspectives and approaches toward teaching. This project explores the parallels between these two revolutionary’s beliefs and the impact that they have on today’s education systems.

94 – Student withdrew submission

95 The Effect of Neck Strengthening Programs on Head Impact Biomechanics in Collision Sport Athletes: A Critically Appraised Topic
Kylie Powell, Paul Scherer
Senior | Athletic Training | Rangos School of Health Sciences
Faculty Advisor: Paul Cacolice, Ph. D.
ABSTRACT:
Context: Concussions are a common sport injury with both short and long term concerns. There are currently limited strategies to prevent concussions during collision sports. It is imperative to accurately assess all current efforts. Clinicians have recently instituted neck-strengthening programs to alter head impact biomechanics. Design: A critically appraised topic (CAT) design was utilized. We chose a P.I.C.O. strategy with the following parameters: Population: Collision sport athletes, Intervention: Neck-strengthening program, Control: No intervention OR control, Outcome: Head impact biomechanics. The following electronic databases were searched: PubMed, Cochrane Library, PEDro, ProQuest, and SportDiscus. Criteria was limited to English-only articles, published in the last 10 years (2004-2014), utilizing human subjects and with a Centre of Evidence Based Medicine (CEBM) of evidence of 2 or higher. Articles looking at non-collision sport athletes were excluded from the research. Results: A total of 5 articles were obtained. Two articles were excluded because they were either classified as a CEBM level of 4 or did not examine cervical spine joint movement and head impact biomechanics. Three articles were then selected for the completion of this CAT. Conclusion: Currently, there is a lack of evidence to support the neck strengthening to alter head impact biomechanics. Further research should be conducted to alter head impact biomechanics with hopes of mitigating concussions.

96 – Student withdrew submission

97 The Effects of High Intensity Warmups on Athletes with Diagnosed Exercise Induced Asthma: A CRITICALLY APPRAISED TOPIC
Emily Nelson, Alyse DePaola
Junior | Athletic Training | Rangos School of Health Sciences
Faculty Advisor: Sarah Manspeaker, Ph.D., ATC

ABSTRACT:
Objective: Evaluating if performance of high intensity interval warmups or continuous moderate intensity warmups prior to physical activity reduces the occurrence and severity of asthma attacks among athletes. Design and Settings: CAT. Subjects: 54 adolescent and adult athletes between the ages of 12-31 previously diagnosed with EIA. Measurements: Peak expiratory flow rate (PEFR; L/min), forced vital capacity (FVC; L), forced expiratory volume in one second (FEV1; L/s), forced expiratory flow between 25-75% (FEF25-75%; L/s), and oxygen uptake (VO2; mL/kg/min). Results: De Bisschop found that performing high intensity warmups prior to a long run demonstrated a progressive increase of peak flow or no change. McKenzie found that the smallest decrease in PEFR, FEV1, and FEF25-75% occurred following a series of short sprints prior to activity. Mickleborough found that those who participated in high intensity interval warmups showed a mean maximum percent difference in post-exercise FEV1 of 9.1±0.6% which, was comparable to the use of an inhaler without warmup (8.9± 6.1%). Schnall found that the smallest decrease in PEFR was after completing a series of short sprints. Conclusions: These studies identified that bronchoconstriction was more likely to occur among athletes who completed a continuous moderate intensity warmup prior to exercise as compared to an interval warmup. Additionally, there is support for the theory that high-intensity interval warmups result in improved
pulmonary function, decreased pulmonary stress, and a period of bronchodilation, thus reducing the likelihood of EIB. A clinical recommendation may be made to include high-intensity warmups aiding in the prevention of EIB.

98 The impact of cancer treatment on work productivity of patients and caregivers: a systematic review of the evidence
Kaysee Gruss, Andrew Giaser, Erica Loadman, Faculty: Jordan Coovey
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Khalid Kamal, Ph.D.

A B S T R A C T:
Background: Cancer is a leading cause of death with a substantial economic burden, including productivity loss. Less is known specifically about the impact of pharmacologic treatments for cancer on patients’ and caregivers’ work productivity. The study goal is to summarize existing evidence and identify knowledge gaps in the impact of cancer treatment on work productivity.

Methods: A systematic literature review was performed according to PRISMA guidelines on MEDLINE, Cochrane, Scopus, CINAHL, and abstract listings for ISPOR, AMCP and ASCO until January 2016. Controlled search terminology included pharmacologic therapies for cancer and terms related to patient and caregiver work productivity. Identifed studies were screened for study inclusion by three independent reviewers with adjudication by two secondary reviewers during the eligibility phase.

Results: A total of 978 relevant citations were identified and 64 articles/abstracts were included in the final synthesis. A total of 46 studies (71.88%) evaluated patient-related productivity, 10 studies focused on caregivers and 8 studies on a combination. The most commonly studied cancer was breast (32; 50%). A variety of metrics were used to quantify productivity (hours lost, return to work, change of status, activity impairment). The most commonly utilized standardized tool was the Work Productivity and Activity Impairment questionnaire.

Conclusions: While it is known that cancer impacts patients’ ability to work, additional research is needed to quantify the indirect costs of treatment including the potential value of new cancer treatments. This information may also be valuable to patients, as they become more engaged in their care through shared decision-making.

99 The Impact of Thermal Analysis Methods on the Categorization of Amorphous Solid Dispersion Behavior
Christine Zdaniewski, Kevin DeBoyace (Graduate Student), Peter L.D. Wildfong B.Sc., Ph.D.
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Peter Wildfong, B.Sc., Ph.D.

A B S T R A C T:
Purpose: Isothermal holds are used when characterizing amorphous solid dispersions by differential
scanning calorimetry (DSC) in order to remove water from samples. It was hypothesized that increasing isothermal hold times during characterization could impact the miscibility of drug in polymer. Miscibility changes that occur as a result of sample treatment could result in incorrect categorization of dispersion behavior.

Methods: Both dispersions of tolbutamide and terfenadine in polyvinylpyrrolidone/vinyl acetate (PVPva) copolymer were prepared via melt-quenching. Tolbutamide and terfenadine were chosen due to previously observed differences in PVPva miscibility. Characterization of solids was done using DSC, polarized light microscopy, and powder X-ray diffraction (PXRD). Isothermal hold times were varied in an attempt to reveal its impact on dispersability.

Results: Tolbutamide/PVPva was miscible and did not phase separate as a result of isothermal holds during DSC characterization for all times tested. A single glass transition temperature was observed in DSC thermograms, no significant birefringence was observed via polarized light microscopy, and there were no peaks in the PXRD diffraction patterns, which indicated the samples remained amorphous. Terfenadine dispersions showed signs of re-crystallization due to the hold time which increased with increasing hold time.

Conclusion: Isothermal holds of the dispersions before characterization had different effects for each compound used. While increased hold times appeared to have no impact on the amorphous state in the tolbutamide dispersions, extended hold times induced crystallization in the terfenadine dispersions. These outcomes emphasize the importance of understanding how each step of a set method can impact characterization results.

100 The Redevelopment of Brownsville
Tiffany Kent
Senior | History | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Andrew Simpson, Ph.D.

Abstract:
Brownsville, a small town located in Southwestern Pennsylvania, witnessed its population decrease by 65% from 1940 to 2000, which has caused financial downfall culminating in town council members begging the town’s electricity provider not to turn off power to the streetlights in 2007. How did a town that held historical significance during events such as Lewis and Clark’s exploration, the French and Indian War, and the Underground Railroad decline so rapidly? Brownsville seems to be suffering from major deterioration largely because of the deindustrialization of the rust belt and the events leading up to it. The severity of Brownsville’s decline requires immediate solutions to begin the process of restoring it to its former glory as a thriving town. But in order to create realistic public policy recommendations, it is crucial to consider Brownsville’s history, including the town’s rise and decline, and current situation. Instead of focusing on projects involving the idealistic renovation of abandoned buildings or the building of a velodrome, Brownsville should build a community college to improve on low education/income levels, infrastructure problems, and decreasing populations. Improving Brownsville is vital not only
because of Brownsville’s historical significance and the benefits the residents would reap, but because of the implications the public policy recommendations may have for the numerous other towns in decline from deindustrialization.

101 The Use of Gas Chromatography Mass Spectrometry for the Detection of Ignitable Liquids on Cloth After Washing
Sarah McGregor
Senior | Forensic Science and Law | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Stephanie Wetzel, Ph.D.

A B S T R A C T:
The detection of ignitable liquids is of value to forensic scientists in the investigation of arson cases. In previous research it has been determined that ignitable liquids splash onto a perpetrator’s pants and shoes when it is being poured around a room. The goal of this research was to determine if ignitable liquids could be detected on cloth after it had been washed. Diesel fuel and gasoline were the ignitable liquids of choice due to their low volatility. Different evaporation times were examined with a warm water wash cycle and drying on low heat for approximately 20 minutes. The volume of ignitable liquid applied to the sample was kept constant. During this research Passive Headspace Extraction and Gas Chromatography Mass Spectrometry (GC-MS) were used for analysis. The method used on the GC-MS was developed based on the method used by National Center for Forensic Science (NCFS). After washing diesel fuel was detected on cotton samples from various evaporation times. Gasoline was more difficult to detect on samples that had longer evaporation times compared to the detection of diesel fuel. These results indicate that clothing, even after it has been washed, may be able to be used to connect a suspect to an arson scene.

102 The Working Mother: The Impact of Work on the Mothering Experience
Amanda DeJames, Linnea Faccenda
Junior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Elizabeth Brown, MA

A B S T R A C T:
Although there is a rich literature exploring the lived experiences of women and mothers in dual-income relationships, a more nuanced investigation of issues surrounding conflicting roles and engagement with career is lacking. This dearth is particularly evident when considering how these variables are experienced by mothers who are primary breadwinners or have children living at home. Given increasing numbers of women who are obtaining advanced degrees and reaching ever higher echelons in the corporate world, more research into experiences of working mothers and the balance of work and home life is timely. The present study aims to explore experiences of role conflict, career engagement, and self-efficacy among heterosexual married and unmarried working mothers. The author is currently administering a survey via Survey Monkey in which the following variables are assessed: self-efficacy, role conflict, and career engagement. Basic demographic information, including children living at home,
overall family size, and breadwinner status, is also assessed. The author is particularly interested in the relationship between being a primary breadwinner and experiencing greater career engagement and role conflict, as well as greater self-efficacy, when approaching work. The author also hypothesizes that having children living at home, who arguably require greater nurturing and attention than children living away from home, will influence work variables including career engagement and role conflict. Analysis will be conducted in SPSS.

103 Time-on-Task Effects on Object Memory: Form vs. Function
Sarah Funyak, Chelsea Day, Alex Walker
Junior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Alex Kranjec, Ph.D.

ABSTRACT:
If given 30 seconds to draw the Apple logo from memory, how accurate would you be? What about a bicycle? We seek to better understand how the mind recalls object details about form and function under various constraints. Specifically, we seek to investigate how time constraints and demands on visual imagery influence a participant’s ability to accurately reproduce common objects from memory. Participants will draw two images from memory: one functional object, (a bicycle) and one purely formal object, (the Apple logo). In Experiment 1, participants will complete each object drawing in either 15 or 30 seconds. To better understand the quality of the mental representation used in the current task, in Experiment 2 participants will play a generic memory card game (for the purpose of interfering with visual imagery) before drawing each object. We hypothesize that a shorter time-on-task may actually produce results showing higher scores for functionality in the bicycle drawing test. Having less time to produce an image may help participants to better represent the most critical aspects of an object as they try to get to the “gist” of the thing. On the other hand, more time may result in more errors.

104 – Student withdrew submission

105 Treatment of Indigenous People in Mexico: 1519-1650
Anthony Barbano
Junior | Secondary 7-12 Social Studies Education | School of Education
Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT:
The basis for my research ties into a class I participated in during the Fall of 2015. Dr. Charles Wilf’s 394: Historical Geography granted me the freedom to construct a final project with two different sections. The first section was to be a research paper and the second was to be a mock lesson plan based upon said research. The freedom lies within the restriction of content I was allowed to pursue: the only country off limits was the United States. I was given the freedom to pick any topic of my choosing from any country in the world during any era in world history. I ultimately decided to research the treatment of indigenous people in Mexico from 1519-1650. The treatment of indigenous people in Mexico is crucial
to the development of the nation as a well as social and cultural identity of the modern Mexican citizen. The near extinction of an ingenious and profound people not only led to a social conundrum of what Mexican "heroes" should be celebrated, but it left many people questioning what truly is Mexican heritage. This can be viewed through analysis of different sexual and gender roles, religious restrictions, and forced physical restraint on indigenous people. The question for the people of Mexico is, as citizens, should we embrace our indigenous roots and culture, or should we hail to the successors of battle who grew Mexico into what it is today?

106 Undercover Heroes? The Culper Ring and the Value of Espionage in the Revolutionary War
Michael Romero Moore
Senior | History | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Andrew Simpson, Ph.D.

A B S T R A C T:
During the American Revolutionary War, espionage was an important tool of war for both sides, but how important espionage was to ending the conflict is an endlessly debated topic. This project studies one of the most well known spy rings used by General Washington during the Revolutionary War, the Culper Ring, which successfully performed espionage missions in New York, a British stronghold during the War. The Culper Ring, which was active from 1778 to the end of the Revolutionary War, the Culper Ring developed some of the first spy-craft techniques in order to operate without detection. Proof of the Ring’s value came in July of 1780, when timely information helped George Washington to ensure the safe landing of Count Rochambeau in Long Island, a feat that raises the following question: were the spies of the Culper Ring the true undercover heroes of the Revolutionary War? The debate regarding the overall effect of the Culper Ring during the American Revolutionary War is well founded; the reliability of books regarding this subject is based on primary sources that are interpreted in order to create a narrative that can be more or less accurate, but they do bring an interesting discussion to the foreground. Drawing from General George Washington’s personal correspondence with the Culper Ring operatives, and using additional information from secondary sources, this project attempts to construct a narrative based on evidence and give a realistic response to this still ongoing debate regarding the true value of Revolutionary War espionage.

107 Understanding the implementation of home programs for upper extremity motor recovery with persons post stroke: Capturing occupational therapy practitioners’ practice and perspectives
Renae Fichter
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Elena Donoso Brown, Ph.D., MS, OTR/L

A B S T R A C T:
Background & Significance: After stroke, upper extremity hemiparesis is a persistent problem that
directly impacts quality of life. Home-programs are often used by occupational therapy practitioners (OTP) to bridge the gap of limited access to services. While the literature reports patient perspectives relative to home-programs for upper extremity rehabilitation, there is no research that describes how OTPs develop and implement home programs.

Objective: This study investigated how OTPs working with individuals post stroke design and implement home-programs to improve upper extremity motor function (HP-UE).

Design: Descriptive, clinician reported online survey.

Participants: Researchers obtained a convenience sample of licensed OTPs (N=73) within the United States who have recently created at least two HP-UE for adults post-stroke.

Results: Most therapists reported creating HP-UE; however, strategies to ensure adherence were not strongly reported. The most common strategies used to instruct clients include: direct training (63.64%), visual demonstration (63.16%), and discussion (60.53%). Most therapists (n=60) identified using home exercise handout creation software (50-100% of the time). However, implementation of novel technology reported was limited. Therapists perceived the most common facilitator to adherence as personal motivation and family support, while the two most common perceived barriers were low motivation and cognitive impairments.

Conclusions: This preliminary description of OTPs’ perspectives on implementing HP-UE provides initial insight into practice patterns. Future research should aim to understand the experience of creating and implementing these programs by therapists and establish areas where future training or intervention could be targeted to improve outcomes for clients post-stroke.

108 Updated Software Development for A Particle Detector
Richard Trotta, Benjamin Torisky
Senior | Physics | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Fatiha Benmokhtar, Ph.D.

ABSTRACT:
Jefferson Lab (Jlab) is a particle accelerator in Newport News, VA which is performing a large-scale upgrade to its Continuous Electron Beam Accelerator Facility (CEBAF). The Large Acceptance Spectrometer (CLAS12) in Hall B is being upgraded and a new hybrid Ring Imaging Cherenkov (RICH) detector is being developed to provide better kaon – pion separation throughout the 3 to 8 GeV/c momentum range. I am presenting my work on the creation of the RICH’s geometry within the CLAS12 java framework. Specifically, the creation of the spherical mirror in the RICH’s geometry and the further progress of preparing the proper dimensions for each object of the detector. This development is crucial for future calibration, reconstructions and analysis of the detector.

109 Use of a Wi-Fi Scale for Remote Data Collection
Julianna Twigg, Melissa Kalarchian, Ph.D.
Sophomore | Biomedical Engineering | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Melissa Kalarchian, Ph.D.

**ABSTRACT:**
Prader-Willi syndrome (PWS) is a genetic disorder associated with intellectual disability and hyperphagia leading to weight gain and obesity, as well as obesity-related comorbidities like diabetes and heart disease. Although youth with PWS who receive a diet and activity program in an inpatient hospitalization setting experience significant weight loss, they are at risk for weight regain after they return home. However, interventions targeting weight maintenance for youth with PWS in the home environment are nonexistent. An interdisciplinary team of investigators plans to adapt, implement and evaluate a weight management program for youth with PWS delivered to parents remotely. One challenge to this type of research is remote collection of data on body weight, implementing and evaluating a successful intervention program. The objective of this biomedical engineering project is to evaluate and rate two different smart scales designed for wireless transmission of body weight. The two scales to be tested are the Tanita BC-1000plus ANT and the FitBit Aria Wi-Fi Smart Scale. Both scales will be tested by weighing two weights on each scale for seven days and comparing their ease of usage, accuracy and reliability. It is expected that due to technology constraints the scales will vary in these domains. By determining the advantages and disadvantages of each piece of equipment, we can select a scale for monitoring the weight and progress of patients with PWS in research. Thus, this project will advance the field of biomedicine by contributing to improved health among an underserved patient population.

**110 Use of Student Response Systems for Initial Learning: Student Perceptions**
Meredith Taylor
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Jeryl Benson, Ed.D., OTR/L, Kimberly Szucs, Ph.D., OTR/L

**ABSTRACT:**
Student Response Systems (SRS) are being used in classrooms worldwide. However, few have examined the students’ perceptions of SRS use and perceived learning. This study was a follow up from a previous study done to assess initial student learning and retention of course concepts when using a SRS as a teaching/learning strategy. After finding that the use of SRS was effective in the classroom, researcher’s wanted to examine student’s perceptions of the device. This study utilized a convenience sample of graduate OT students enrolled in two courses in the fall of 2015 & 2016. This sample provided information regarding the ease of use, acquisition of course content, and the process of instruction utilizing the SRS device. Data was collected in two courses, taught by two different instructors to minimize the influence of teaching style on outcomes. The participant’s completed an anonymous online survey after the completion of the two classes. The survey included questions regarding operation of the clickers, impact of the use of clickers on student learning, retention, clinical reasoning, and students’ perceptions of their learning experiences using a Likert scale. The participants also provided a narrative in response to open ended questions. Survey results from the Likert Scale were
analyzed using descriptive statistical methods. Narrative data from the open ended questions was analyzed using cross sectional and categorical indexing beginning with a literal and interpretive review of the open-ended responses from the survey and culminating in the development of categories. Outcomes will be presented.

111 Using the Oculus Rift for Molecular Visualization
Brian Adams
Junior | Computer Science | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Jeffry D. Madura, Ph.D.

ABSTRACT:
Molecular visualization software such as VMD and PyMol, have a significant amount of popularity among the computational science community. Each program is simple to use and provides a wide variety of methods to visualize large data sets. However, one of the significant frontiers that they have always lacked in is virtual reality (VR). The methods to properly visualize a molecular structure inside a virtual reality construct are few and often are very expensive. However, with the creation of the Oculus Rift, a VR headset, we have the ability to not only view structures in 3D stereoscopic vision but also manipulate structures, allowing the molecular modeling community to use it to their advantage. We have combined the capabilities of the Unity game engine and the Oculus Rift to develop a VR environment to visualize biomolecular systems.

112 Utilizing Microsatellite Loci to Study the Genetic Population Structure of the Bluebreast Darter in the Upper Ohio River Watershed.
Taylor Cutteridge, Anthony Honick
Senior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Brady Porter, Ph.D.

ABSTRACT:
The bluebreast darter, Etheostoma camurum, is a fish that historically lived in small isolated populations within the pristine refugia of the Ohio River watershed. Pennsylvania surveys in 2005 revealed a new population in Deer Creek, PA, hundreds of river miles from the closest populations in central Ohio, Indiana, and northwestern Pennsylvania. As water quality improved, the geographic range of this species has increased to where these populations are now in contact with one another. The historical isolation of these populations has caused differences in microsatellite allele composition or frequency due to genetic drift and inbreeding. In this study we used PCR to cross-amplify eight microsatellite loci for fragment analysis to study the genetic structure. To confirm that these loci were informative and possess the ability to distinguish bluebreast darter populations, we analyzed the structure of three geographically isolated bluebreast darter populations (Tippecanoe River, IN; Kokosing River, OH; French Creek, PA). In addition, we utilized these loci to compare the genetic population structure of bluebreast samples gathered around the Pittsburgh area. We hypothesized that microsatellite analysis of the
Pittsburgh samples would elucidate their source population(s), allowing us to genetically track the range expansion of this recovering species.

**113 Validation of the Standardized Touchscreen Assessment of Cognition**
Lani Zangara, Elena Donoso-Brown, Sarah Diehl, Joanne Kinney, and Sarah Wallace, Ph.D.
Senior | Occupational therapy | Rangos School of Health Sciences
Faculty Advisor: Elena Donoso-Brown, Ph. D.

**A B S T R A C T:**
Although there are many assessment tools to measure cognitive abilities, most provide limited qualitative data and require significant time to score. The Standardized Touchscreen Assessment of Cognition (STAC) is an innovative iPad-based assessment tool which seeks to address accuracy and efficiency in assessing cognitive abilities while also providing qualitative information. The initial phase of this investigation involved validation of this assessment on adults ages 18-85 years with typical cognitive function. The purpose of the second phase is to continue the validation of this assessment tool in individuals with traumatic brain injury (TBI). The researchers have compared the performance of 22 people with TBI on the STAC to two frequently utilized assessments in rehabilitation settings, the Montreal Cognitive Assessment (MoCA) and the Cognitive Linguistic Quick Test (CLQT). Descriptions of participants’ experience of using the STAC versus pencil and paper assessments indicated that majority of participants felt comfortable completing the assessment on the iPad. Analysis from the first 22 individuals with TBI has found stronger correlations between the STAC and the CLQT compared to those observed in people with typical cognitive function. Additionally, significant correlations were noted between the STAC and the MoCA. These findings suggest that the STAC is a robust measure of cognition that evaluates similar areas of cognition as the CLQT and MoCA.

*114 Vancomycin dosing considerations in patients with liver cirrhosis*
Jennifer Hoh, Katherine Guido, William Ross
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisors: Branden Nemecek, PharmD, BCPS and Anthony Guarascio, PharmD, BCPS

**A B S T R A C T:**
Vancomycin is a commonly utilized antibiotic in the acute care setting in patients with liver cirrhosis. This patient population has less albumin to bind vancomycin and potentially increasing free drug concentrations. Little guidance on dosage adjustment strategies is currently available. The purpose of this study was to give a better understanding of such strategies for patients with liver cirrhosis. This retrospective cohort study was performed at an academic medical center examining 307 adult inpatients with liver cirrhosis and concomitant vancomycin therapy between 4/1/2011 and 4/1/2015. Vancomycin drug concentrations and mean steady-state drug concentration/dose (C/D) ratios were measured and described according to severity of liver disease. Correlations of liver disease severity were performed for total bilirubin, INR, transaminases and model for end-stage liver disease (MELD) scores while standardizing data for renal function and the presence of nephrotoxic agents. Our results show
patients with higher MELD scores demonstrate higher vancomycin trough levels, C/D ratios and a larger variability than those with lower scores. Higher MELD scores were also associated with slightly lower baseline albumin levels, suggesting a role in the variability of trough levels. Data also shows patients who received concurrent administration of spironolactone, furosemide, and piperacillin/tazobactam has higher median vancomycin trough concentrations than those not receiving these agents. This study highlights the need for future research of vancomycin dosing in this specific and high-risk patient population.

115 Safe Sleep Practices of African American Mothers for their Infants
Clare Banigan, Devyn Brewster
Junior | Nursing | School of Nursing
Faculty Advisor: Cynthia Walters, DNP, MSN, RN

A B S T R A C T:
In the African American population, there is a disparity in healthcare knowledge about safe sleep practices, which equates to a higher percentage of sudden infant death syndrome (SIDS) in African American infants. African American infants are two times more likely than non-Hispanic white infants to die from SIDS. To address this issue, we undertook a literature review of current research on safe sleep practices among African American mothers. Eight articles were analyzed and the data from each was then used to formulate a conclusion. The data suggests there is a lack of knowledge regarding safe sleep practices and the how these practices relate to SIDS. Literature reveals that infant safety is a significant priority within this population, but the practices within this culture are varied and do not always align with health care provider recommendations. Non-adherence from safe sleep standards is often related to cultural and familial influence, more specifically influences of maternal relatives. To address the issue of safe sleep practices within this population, healthcare professionals can provide greater detailed rationales for safe sleep recommendations and the direct correlation between infant positions, location, and SIDS. Providers should focus on positive language and messaging about safe sleep practices when creating educational materials for mothers and other infant care-givers. Healthcare professionals can use the current research of the knowledge and beliefs of African American mothers regarding safe sleep recommendations to focus their educational materials on addressing the specific cultural beliefs within this population.

116 Working Moms: Relationships Between Sexual Orientation, Efficacy, and Work-Related Variables
Linnea Faccenda, Amanda Delames
Sophomore | Management | A.J. Palumbo School of Business Administration
Faculty Advisor: Elizabeth Brown, M.A.

A B S T R A C T:
Although there is an extensive literature exploring work-life issues among heterosexual working mothers, there is a considerable dearth in explorations of how variables such as self-efficacy and impostorism are differentially experienced across lesbian and heterosexual populations of working mothers. Given the current cultural climate surrounding heterosexual working mothers, the author is
interested in both maternal confidence and work issues as possibly impacted by broader societal attitudes towards women who work and mother. Additionally, attitudes towards lesbian women as primarily sexual and secondarily maternal influence the author’s conceptualization of lesbian working and mothering experiences. The present study aims to explore the lived experiences of self-efficacy and the imposter phenomenon as well as work-related variables such as career engagement, role conflict, and role overload. The author is currently administering a survey via Survey Monkey in which the following variables are assessed: the imposter phenomenon, self-efficacy, maternal self-efficacy, role conflict, role overload, and career engagement. Basic demographic information, including sexual orientation, family size, and household income, is also assessed. The author is particularly interested in the relationship between sexual orientation, maternal self-efficacy, and work variables, and hypothesizes heterosexuality and a greater number of children as protective factors in determining maternal self-efficacy. The author also hypothesizes that career engagement will function as a moderator of role conflict and role overload. Analysis will be conducted in SPSS.

117 Catholics and the Klan: Catholicism’s Contribution to the Decline of the Ku Klux Klan in Western Pennsylvania
Mark Smithson
Junior | History | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Andrew Simpson, Ph.D.

A B S T R A C T: During the early twentieth century the racist organization known as the Ku Klux Klan began to spread through the United State, including Pennsylvania. Although they were mostly known for their views on African Americans, they held anti-Catholic sentiments as well. This paper analyzes the attempts of the rising, western Pennsylvanian Catholic population to hinder the growth and aid in the decline of the Ku Klux Klan. The Catholics utilized newspapers to display the corruption of the Klan as well as denounce them as an immoral organization to the general public. Political means were also used to suppress the Klan, such as having Catholic members of the judicial system deny parade permits for them. In some instances, violence was utilized by Catholics to thwart Klan demonstrations and dissuade further Klan activity in the community. Along with these early twentieth century examples of Catholic abhorrence of the Klan, a recent Catholic article on Klan activity in Pittsburgh is included to demonstrate the ongoing conflict between the western Pennsylvanian Catholics and the Ku Klux Klan.

118 The Western Sahara Conflict: Colonialism, Ethnicity, and the Bonds of Nationhood
Mitchell Oeler
Senior | International Relations | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Jennie Schulze, Ph.D.

A B S T R A C T: This paper seeks to examine the patterns that the ongoing conflict in the Western Sahara follows. The ultimate aim is to see to what degree different theories of ethnic conflict apply to Western Sahara and
what policy prescriptions such considerations can produce for the powers trying to negotiate a resolution. It begins by introducing the conflict and its history and providing the purpose for the study of this topic. It then proceeds to discuss the various patterns of ethnic identity formation and how their application to the case of Sahraouis and Moroccans is either substantiated or repudiated by the historical evidence. The primary theories are instrumentalism, primordialism, social construction, and psychological approaches. I argue that the method employed by Sahraoui leadership to convey a sense of separation from Moroccans is social construction leaning toward instrumentalism, and that Morocco’s argument is conversely primordialist in equal measure. I conclude with a discussion of what policy prescriptions these findings produce for those attempting to negotiate a settlement. Specifically, I contend that the Polisario ought to begin to recognize integration with regional autonomy as a legitimate option for the referendum because the ethnic ties between Moroccans and Sahraouis are significant enough to warrant such an affiliation. The paper draws primarily from three kinds of sources: historical data on the conflict, existing literature on the conflict, and existing literature on ethnic conflicts in general.

119 A COMPARISON OF TRUNK AND UPPER EXTREMITY POSTURES ACROSS TECHNOLOGY AND HAND-HELD DEVICE USE IN COLLEGE STUDENTS

Marissa Rakow, Kimberly A. Szucs, Kara Cicuto
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Kimberly Szucs, Ph.D.

ABSTRACT:
Background & Significance: The use of hand-held mobile devices, has increased significantly in recent years. A common observation of people using hand-held devices reveals that they frequently adopt postures of the upper limb and neck that could result in musculoskeletal pathology. In order to understand the risk of developing musculoskeletal pathology from hand-held technology use, it is necessary to determine the pattern of use of different devices. Comparison of postures across devices will give a more complete picture of the impact of multi-device use on the development of faulty postures and potential musculoskeletal pathology.

Objective: The purpose of this study is two-fold: 1) to determine what postures are assumed with use of different hand-held devices, and 2) determine if the postural alignment of the upper quarter assumed during the use of hand held mobile devices deviate from the normal postural alignments.

Design: This study utilizes a descriptive design.

Participants: Individuals currently enrolled at Duquesne University with no history of shoulder injury or pathology.

Results: 17 subjects have completed the study with a recruitment goal of 25 participants. Data analysis is ongoing. On average, subjects stood with their head slightly translated and tilted to the right, with increased neck flexion. Variability was high across subjects for each posture variable. A preliminary
analysis of the postures during device use demonstrates trends towards increased head anterior
translation and lateral translation.

Conclusions: Students who frequently use hand-held devices assume close to neutral standing postures,
with the exception of large forward head flexion.

120 A Culturally Responsive Approach to Teaching
Adam Moskowitz
Sophomore | Early Childhood Education | School of Education
Faculty Advisor: Christopher Miedl, Ph.D.

Abstract:
In today’s diverse classrooms it is so important for teachers to understand the framework and
implement it. This research paper explores the philosophy of a culturally responsive pedagogy and its
application to elementary school setting. Culturally responsive pedagogy is a philosophy in which
teachers take students cultural experiences and bring it into the classroom. (Landson-Billings 1994; Gay
2010). This paper defines the framework of this pedagogy and the practical application to classroom
environment, use as an effective classroom management tool, and instruction in Mathematics and
Language Arts. This paper is a combination of literature reviews and interviews with experts in
education. The interviews have corroborated literature findings while also giving valuable insights that
deepens the understanding and application.

121 A Sound Science
Mallika Singh, Christopher Wood
Junior | Music Therapy | Mary Pappert School of Music
Faculty Advisor: Jessica Wiskus, Ph.D.

Abstract:
The universe is filled with things that can be proven to exist, but cannot be perceived by the human
senses. In the late 16th and early 17th centuries, fascination with the invisible forces behind nature and
the destiny of human life led two great figures, Thomas Tallis (a composer) and Johannes Kepler (an
astronomer) to search out hidden mathematical relations and express them in their works. Thomas
Tallis hid meaning in the forty-part harmony of his immense composition, Spem in Alium (c. 1570),
which links its musical content with the philosophy of the ideal realm. And in his book Harmonices
Mundi (1619), Johannes Kepler saw in the nuances of planetary motion the scaffolding of a system of
musical harmony. According to Kepler, music occurs naturally in the world around us, appearing in the
ratios of environmental phenomena, such as the ratios of planetary motion. Both Kepler and Tallis
worked according to a philosophy of the beyond, attempting to articulate that which cannot be
perceived with the senses but can only be measured through mathematical or numerological means.
Their work leads us to conclude that music is everywhere, even when it is not expressed in audible
sounds, and that our own music as performed, is based on the invisible structures or ratios of the
universe.
122 American Health Care: The Marginalization of Patients and Consumers within the American Health Care System
Kelvin Parnell, Jr.
Senior | History and Art History | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Michael Cahall, Ph.D., Julie Sienkewicz

Abstract:
Is there a link between consumerism and citizenship in America? Since the beginning of the 20th century this question has been long fought over. After the end of World War II, no one doubted this link any longer. The affluence of the United States during the late 40s to early 60s increased dramatically, therefore systematically linking the two together. During the same time period medical patients and consumers were often thought to be a synonymous term. The commodification of healthcare over the past century made it more valuable with each passing decade. This has created a marginalization of both patients and consumers as access to healthcare increasingly diminishes and prices continually rise. There have been attempts throughout the 20th century to make healthcare more affordable and accessible, but those efforts have largely failed due to a multitude of outside factors such as the AMA and partisanship. These attempts have come in the following forms: Government run healthcare, Medicare & Medicaid, the Health Security Act, and the current Affordable Care Act. Only Medicare & Medicaid, the Affordable Care Act have been successful, but Americans still experience rising health cost and vast amount of the population uninsured. This paper explains in-depth different attempts at changes in health care policy, but also explores alternatives to past legislation that will not only lower the cost of healthcare, but also make it accessible to all Americans.

123 An Adventure for Inspiration: Rediscovering the Creative Process Through the Grand Tour
Josef DiPietrantonio, Liza Torrence (Miami University)
Senior | Mathematics B.S. | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Kathleen Glenister-Roberts, Ph.D.

Abstract:
A presentation of an Endowed Honors Fellowship multi-part collaborative research project investigating the Creative Process through experiences and adventures associated with The Grand Tour, a 17th century European expedition that exposed young minds first-hand to culture, art, and music. We planned our travels in a parallel version of The Grand Tour so that we could study similar scholarly works of the liberal arts first-hand, with a modern perspective. The experience was primarily utilized as inspiration for creating artistic works, which culminated in a series of multimedia projects presented as an art exhibition. The artworks in the exhibition were derived from inspirations found in Rome, Florence, Paris, Berlin, and Salzburg. The inspirational experiences included, but are not limited to, fine art, graffiti art, music concerts, performances, monuments, sporting events, and people we met during our travels. This journey, from proposing the project and taking the tour, through post-production of the artistic works, has given us insight on the creative process as well as how to work towards creativity at all times. We found from our experience that adventure sparks inspiration that in turn fosters creativity, and that
the involvement in this cycle promotes the creativity of oneself, as well as the creativity of others. We learned to take advantage of the time at hand to seek out inspiration through our own form of adventure, specifically by partaking in both relatable and new inspiring experiences, allowing us to experiment with ideas and take risks in order to explore new creative outlets.

124 An Exploration of the Role of Sensory Based Theory in School-based Occupational Therapy
Meghan Roach, Emily Breisinger
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Jeryl Benson, EdD, OTR/L

Abstract:
This research study explores the role of sensory-based interventions, assessment, and equipment used in school-based occupational therapy. School-based occupational therapists are concerned with a child’s functional abilities necessary to complete the expectations of the student role. These expectations can be challenging for the 40-88% of children with various disabilities who experience some sort of sensory dysfunction. Sensory-based interventions are utilized to address the needs of these children who experience sensory dysfunction (Adrien et al., 1993; Dahlgren & Gillberg, 1989; Kientz & Dunn, 1997; Ornitz, Guthrie, & Farley, 1977; Talay-Ongan & Wood, 2000, as cited in Ahn, Miller, Milberger, & McIntosh, 2004). By means of survey methods, this study will pursue an understanding of current sensory based theory applied in school-based occupational therapy. Licensed occupational therapists with at least two years of clinical experience in a school setting will be questioned through an anonymous online survey to generate data regarding demographic information, employment, and practice patterns utilizing sensory-based interventions. Questions posed will seek to gather descriptions of sensory-based interventions employed in practice and also to discover which current practice trends influence sensory-based occupational therapy practice. Descriptive numeric data from the completed questionnaire will be compiled and summarized (frequencies, means) using statistical software. Responses to open ended questions will be analyzed utilizing the constant comparative method of qualitative analysis. This study will contribute to a greater awareness of the prevalence and trends of current sensory-based interventions used by school-based occupational therapists.

125 Authentic Music Education: Accurately Representing World Music in the Elementary Classroom
Kaitlyn Caron,
Junior | Music Education | Mary Pappert School of Music
Faculty Advisor: Rachel Whitcomb, Ed. D.

Abstract:
It is important for growing musicians to be exposed to music of different cultures at a young age. It is the music educator’s responsibility to facilitate an environment that is open to the exploration of world music. However, there are many potential problems to be cautious of when teaching global music in the
elementary classroom. Teachers need to be aware of the context, history, and authenticity of the music they introduce to the classroom. It is important that they find several means of exposing children to multicultural music and broaden the scope of the music to include the culture it is derived from. Patricia Sheehan Campbell, Huib Schippers, and William Anderson have all completed extensive research in world music and how it is applied to music education. Their writings serve for the foundation of this piece. This project will explore all of these issues and propose ways for music educators to teach world music as fully and genuinely as possible.

126 Believable Brains: Are Some Neuroscience Images Better Than Others For Influencing Beliefs

Alison Mazefsky, Connor Williams
Junior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Alex Kranjec, Oh.D

A B S T R A C T:
Believable Brains: Are Some Neuroscience Images Better than Others for Influencing Beliefs?

Neuroscience has significantly entered the public imagination. People seem to be easily influenced by neuroscience “facts” even if unfamiliar with the details of the associated research. Neurosciences images have been shown to be particularly persuasive. Past research has demonstrated that people are more likely to believe a neuroscience fact if accompanied by a neuroscience image. The present study further tests this idea by investigating whether some neuroscience images are better than others. We test if “real” radiological images of brains are more persuasive than more abstract drawn images. We designed a 36 statement survey. Half of the facts in our survey are neuroscience findings while the other half are statements that are explained by social science findings which have been altered to include arbitrary information about brains. Most importantly, each statement is paired with an image. For both the neuroscience and social science statements, half are accompanied with a real brain image (e.g. an MRI) while the other half are accompanied with a brain illustration (e.g., a schematic diagram). Participants are asked to rate the believability of each statement on a scale of 1-5. One hypothesis predicts that neuroscience statements accompanied with the real brain scans will be the most believable category because “real” brains are more suggestive of “real” data. The results of this study may tell us more about the ways in which neuroscience is used to sway people’s opinions and how brain images in particular are used to manipulate beliefs in the popular media.

127 Benefits of Occupational Therapy with Homeless Veterans

Nicole Farrar, Molly Edwards, Brianne Haneman & Sisi Jin
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Audrey Kane, Ph.D.

A B S T R A C T:
In the past year, Duquesne Occupational therapy students have interacted with homeless veterans on a weekly basis to address occupational performance needs through community engaged learning.
Homeless veterans living at Shepherd’s Heart experience depression, anxiety, PTSD, and stigma. Occupational therapy benefits the veterans by providing coping strategies, participation in leisure, self expression techniques, and improvement in overall well-being. Throughout the session at Shepherd’s Heart, the men have demonstrated increased engagement in participation and interaction with the occupational therapy students. There has been an observation of increased trust with the veterans as a result of the progression of the sessions. The men have expressed how the occupational therapy students have positively affected them and allowed them to gain skills and identify positive aspects of their life. The benefits of occupational therapy have been seen through patient interviews, clinical observations, and tangible artifacts. Thus, occupational therapy has influenced the client’s in improving their habits and routines to improve psychological well being.

128 Can Legal Prostitution Reduce Sex Trafficking?

Autumn Goodson
Junior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Elizabeth Cochran, Ph.D.

ABSTRACT:
There is an epidemic of modern slavery here, in The United States, as thousands of women, men, children, and teens are trafficked into our country illegally, each year. Many of these people are forced, against their will, to leave their homes and to have sex with strangers. The phenomenon of sex trafficking raises questions about whether there could be compelling arguments for legalizing consensual prostitution. Although many moral traditions condemn having sex with multiple people and/or for money, scholars such as Martha Nussbaum argue that the legalization of prostitution could, potentially, lead to significantly smaller number of humans that are trafficked in America. My research considers Nussbaum’s argument alongside Andrea Dworkin’s argument against legalizing prostitution. I also consider whether the Christian views of sin of Augustine or Reinhold Niebuhr could support legalizing prostitution in order to reduce human trafficking.

129 Describing Students Perceptions of a Structured Journal Club for Learning Evidence Based Practice Methods

Brianne Haneman
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Kimberly Szucs, Ph.D., OTR/L

ABSTRACT:
The purpose of this study is to assess the effects of a guided Journal Club in graduate occupational therapy students and their learning of Evidence Based Practice. A guided Journal Club involves a group discussion of a current article using specific questions as provided by the American Occupational Therapy Association's Journal Club Toolkit. The study also explores the perceptions of students' satisfaction, perception of knowledge and skills gained, and confidence in presentation skills, critical appraisal of research articles, and contribution to discussions. The design is a pre-test/post-test,
repeated measures, mixed methods design. The participants, thirty graduate, occupational therapy students completed three surveys using Survey Monkey, during their 8 week course on Evidence Based Practice. The course is divided into three modules beginning with an introduction to the concepts and skills of Evidence Based Practice. The second module involves using the skills in reading and critically analyzing articles. Finally, in module three, students are divided into groups and lead and participate in guided Journal Clubs. Outcomes for this study are pending.

130 Development of interpersonal and clinical skills at St. Anthony’s Life skills apartment
Haley Lipscomb, Sara Cassidy & Carly Sullivan
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Audrey Kane, Ph.D.

A B S T R A C T:
The purpose of this project is to explore the development of our interpersonal, as well as, clinical skills during our time at St. Anthony’s life skills apartment. The St. Anthony’s life skills apartment aims to teach students with intellectual disabilities skills that are important for living independently by allowing them to practice these skills in a realistic setting. Our role as occupational therapy (OT) students at the apartment is to plan and implement sessions that are well-rounded to meet each individual’s needs. This process has helped us as future clinicians grow, expanding both our clinical and interpersonal skills. Throughout our time we have been able to gain clinical skills in relation to managing challenging behaviors, adapting interventions based on diagnoses, being flexible with our plans and willing to change based on how the sessions are going, and professional communication with the head of the life skills apartment. Additionally, this project will introduce our use of the intentional relationship model discussed in our OT courses, and how this model was used during our time at the St. Anthony’s life skills apartment. The intentional relationship model is a way to define the therapeutic relationship. This model takes into account the therapists, the client's interpersonal characteristics, the occupation that is being worked on, and then interpersonal events that could happen during therapy. During this project, we will describe the ways in which this model has guided our development of interpersonal, and clinical skills while working with this population.

131 Emmaus Community of Pittsburgh: Community Engaged Learning
Abigail Moonis, Alexandra Scriefar, Yinao Wang
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Audrey Kane, Ph.D., MS, OTR/L

A B S T R A C T:
The purpose of this project is to address the occupational performance issues and outcomes of our experience working with the residents of the Emmaus Community of Pittsburgh. This is a residential housing facility for older adults with intellectual disabilities and Autism Spectrum Disorder. During community engaged learning, the identified performance issues being addressed included social skills, leisure exploration, and self-expression. Through use of interventions with this group, we hoped to
increase the client’s social participation with others in addition to providing strategies for activities for leisure and how to express their feelings both verbally and through other media. We hoped to increase these client’s skills by using methods and tactics that work with these clients, focused on their interests and needs.

132 Ethnic Food and Identity
Andrea Spence, Allison Fischer
Freshman | Integrated Marketing Communications | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT:
Authentic ethnic food is a complex and multi-leveled idea; it has many different meanings for many different people. Ethnic food represents a way of life for millions of Americans. The United States is often considered a melting pot, cultures from across the globe are represented through the crafting of ethnic cuisine. In our research, we analyzed different definitions of ethnic food and how it helps to create an identity for humans across the country. Our project demonstrates the complexity of ethnic identity in the modern day multicultural United States. We examined how ethnic food reflects diet, tradition, and the interactions between differing heritages across the country, as well as allow diverse groups to share their cultural values with others. To gather a better understanding on the significance of ethnic food nationwide, we have explored this topic through food encyclopedias, periodicals, and academic journals. We focus on a specific geographical area; the city of Pittsburgh, and have identified the effect of food on neighborhoods such as The Hill District and The Strip District. Exploring local food trends has revealed the reputation and values of residents within the city. The foundation of our research specific to Pittsburgh has come from directly speaking with restaurants and locals within the city, and we will continue to seek out others opinions on ethnic food in order to accurately assess its impact.

133 Eugenics and Birth Control: Better Living and Better Babies
Nicole Cordier
Junior | History, Classics | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT:
The relationship between the early birth control movement and the eugenics movement is frequently ignored or downplayed in modern scholarship. Although the two movements did not agree on every point, they both acted with the goal of promoting and maintaining racial purity. A prolific writer and prominent activist, Margaret Sanger wrote over 600 articles and speeches, two autobiographies, and multiple books on birth control. Her writing reveals the extent to which eugenics influenced the beginnings of the birth control movement, including the insistence that it was impossible for a free race to come from enslaved mothers. Modern day birth control movements tend to focus on the liberation of
women; although Sanger advocated liberating women, it was the means to her goal of racial improvement. Understanding the difference between these two goals is crucial to understanding the ways in which Sanger and her contemporaries were products of their time period. This project sheds light on Sanger’s eugenic ideas, especially as they pertain to race and class, in order to promote an honest dialogue about the origins of an important feminist movement.

**134 Student Withdrew Submission**

**135 Experiences of Community Engaged Learning at Renewal Drug and Alcohol**
Eric Dodson, Ashley Nischwitz, Jessica Sanfilippo
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Audrey Kane, Dr.

**ABSTRACT:**
The presentation will focus on how participation in community engaged learning has impacted the clients at the Renewal drug and alcohol program throughout leading the health and wellness class. Students were able to improve the client’s experience in the outpatient program by creating sessions that were formulated and evidence-based for this underserved population. Information will be presented that has been gathered directly from clients including samples of projects completed during the classes as well as feedback given by the clients.

**136 Measuring Spawning Mortality in Western Lake Erie Walleye Populations Using Acoustic Telemetry**
Zachary Steffensmeier, Dr. Chris Vandergoot
Junior | Environmental Science | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Brady Porter, Ph. D

**ABSTRACT:**
Walleye are a keystone species in Lake Erie. They are essential in shaping the ecosystem and support large recreational and commercial fisheries. This long-term collaborative research project between ODNR and students in the Stone Lab REU program have used acoustic telemetry to observe walleye movement throughout Lake Erie and surrounding tributaries. These data were used to analyze spawning mortality of walleye on the Western Basin Reefs and are important to give a better picture of walleye demographics in Lake Erie. Walleye were collected in 2013 with experimental gill nets and anesthetized using eletronarcosis. One hundred males and sixty-five females were surgically implanted with acoustic telemetry transmitters, and then released near their capture locations. Individual fish were observed on acoustic telemetry receivers throughout Lake Erie and surrounding tributaries. The tagged fish were detected 37,382 times between the spring 2013 and fall of 2014. By recreating the movements of each fish using acoustic telemetry we determined that 88 out of the 165 tagged fish showed up on the western basin reefs 90% of these mating fish survived the 2014 spawning period. Males were shown to have mortality rates three times higher than females. Males also were determined to stay on the reefs
for a significantly longer period of time than females. Mortality may be higher in males than females because of spawning ecology. These data provide a better understanding of population demographics that can be useful for stock assessment modeling.

137 Occupational Therapy for the Psychosocial Needs Of Community Dwelling Adults With Developmental Disabilities
Taghreed Turkistani, Jordyn Moon and Rhea Tao
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Audrey Kane, Ph. D.

Abstract:
As occupational therapy students, we were given the task of interacting with an organization in the community that is unserved by occupational therapy. We chose an organization called Community Living And Support Services (CLASS) located in Pittsburgh, PA. CLASS currently provides educational courses to individuals, ages 18 to 59, with diagnoses including cerebral palsy, acquired brain injury, and intellectual disabilities/developmental disabilities. The current education courses at CLASS focus on increasing the student’s independence in community living and include cooking, computer, stress management, and many other courses. As occupational therapy students, our purpose is to address the student’s psychosocial factors to enable the students to perform these community occupations. Psychosocial factors are the psychological (i.e., personality or attitude) and social factors (i.e., social supports and lifestyle) that influence mental health. We specifically focused on the psychosocial factors of self-expression and social skills. Additionally, we focused on the importance of participating in leisure activities in the community to increase mental and physical well-being. During our time spent at CLASS, the clients shared valuable feedback about how their participation in our sessions have influenced their life or brought attention to their psychosocial well-being.

138 Occupational Therapy Services in Community Engaged Learning (CEL)
Alexandra Smith, Haylee Potteiger and Emily Breisinger
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Audrey Kane, Ph.D.

Abstract:
This scholarship-based presentation is meant to highlight the value of occupational therapy (OT) services in a setting where OT is not currently employed. Over the course of this academic year, Duquesne University’s OT program has sent groups of 4th year students to community based settings in order to implement different assessments and intervention plans. This portion of the OT program is known as Community Engaged Learning (CEL). While the experiences of the student’s at different sites are varied, a majority of the groups report that their participation has yielded positive changes within both the individuals they work with as well as the settings. The authors of this presentation will be focusing on their personal experiences working with the individual's in the St. Anthony's Apartment Living Program. This program is designed to help college age individuals with intellectual and developmental disabilities.
learn the skills needed to live as independently as possible. Typically a single staff member runs this program and has the group read through and then verbally recall or physically demonstrate steps about different homemaking tasks presented on a handout. While this strategy was effective in teaching the students new skills, it became apparent that there were other occupational performance deficits that were limiting the students’ abilities to reach their full potential. Through the incorporation of the author's OT based sessions during CEL, these occupational performance deficits were directly addressed which ultimately lead to a positive increase in the St. Anthony students' level of participation, function, and quality of life.

139 Pennsylvania Gas Drilling.
Alexis Washington-Smith
Freshman | Sociology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Michael Irwin, Ph.D.

ABSTRACT:
Gas drilling has been an expanding industry all across the United States, used mainly to extract natural gas and oil, this phenomena has unfortunately put Pennsylvania, “The Keystone State” in turmoil. Due to gas drilling or as some call it hydro fracking, many issues have arisen. For instance there’s the issue of environmental racism, where only certain areas are being drilled in, most of which are poorer areas. These areas face all the health issues and risk of fracking, while the more affluent areas reek all the benefits that comes from it. Another issue, which might be the most significant issue is the health concern and problem that comes from drilling. Tons of chemicals and toxins are being allowed into the water supply of these areas and a grand majority of these companies do not follow the proper procedure when drilling, which only makes these issues astronomically higher. With the health of local residents close to these drilling sites becoming extremely high, this puts the lives of many families at risk. Gas drilling not only affects certain areas and the health of these individuals, but it also destroys our air quality. With our air quality being affected, many problems can occur, some of which can lead to a ton of respiratory problems and cancers and many more health concerns. The sociological topics I’ll be discussing relating to fracking will be environmental racism, the treadmill of consumption, Thomas Malthus’s carrying capacity, environmental justice, power and environment.

140 Pittsburgh’s Own Exposition
Katie McGann
Sophomore | Secondary 7-12 Social Studies Education | School of Education
Faculty Advisor: Alima Bucciantini, Ph.D.

ABSTRACT:
Pittsburgh, Pennsylvania became an international linkage of industrialization, urbanization, and rapid population growth in the late nineteenth century. This hustling and bustling city attracted families from all across the country and all over the world. Families like the Fricks, the Carnegies, and the Phipps started their empires during this time period. But they would not have achieved their name recognition
without first contributing to and visiting the 1893 World’s Columbian Exposition held in Chicago, Illinois. The Fair was filled with displays and light fixtures all from the Steel City, but that was just the beginning. The people of Pittsburgh benefit after the World’s Fair ended. To this day, the legacy of the Columbian Exposition is seen in every corner of Pittsburgh. Frick Art and Historical Society was where I began to find out about the Frick families venture to the World’s Fair and saw some of the artifacts they brought back to show family and friends. I learned of the Frick’s connection to Daniel H. Burnham, the chief of construction of the fair. Further research of several journals and books written about the Chicago World’s Fair led to the discovery of many more Pittsburghers that had major contributions to the exposition. Through my research I found that although Pittsburgh seemed to put so much into the fair, they also seemed to get the most out of the fair. The Phipps Conservatory, Carnegie Museum system, the Frick Building downtown, and several other Pittsburgh staples would not have come about without the World’s Columbian Exposition.

141 Spatial and Temporal Estimations of Familiar Objects and Events
Jennifer Rauch, Nicolas Kroger
Junior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Alex Kranjec, Ph.D.

ABSTRACT:
How do we perceive and experience intangible things such as “time”? In the English language, we often talk about temporal events using spatial language, such as length (E.g., This class is so long!). While it seems easier to think about spatial relations as compared to temporal ones, the current study investigates people’s accuracy at estimating the extent of temporal versus spatial events. We randomly survey Duquesne University students asking them to estimate the duration of temporal events (in seconds, minutes, or hours) and spatial length or height of objects in space (using inches, feet, or miles). Events and objects were selected based on their familiarity in daily life (E.g. The length of a pen or the time it takes for water to boil). After completing the surveys, we will compare the actual measurements of the designated events and objects to the participant’s responses. We predict that people will show greater variability and larger error in estimating temporal events because it is more experientially and conceptually abstract; we can more easily “image” a physical entity in space, as compared to an abstract event in time.

142 Systemic Solutions to Systemic Problems of Injustice: Exploring Empathy and Self-Awareness in Preservice Teacher Training and the Preschool to Fourth Grade Classroom
Christina McElwee
Sophomore | Early Childhood Education | School of Education
Faculty Advisor: Patricia Sheahan, Ph.D.

ABSTRACT:
Social justice issues are systemic problems of inequity that must be dealt with in a systemic way if they are to be resolved; it is my belief that resolution will come through the development of young children
via trained preservice teachers, equipped to teach about empathy and inequity while celebrating diversity. If children, ages preschool to fourth grade, become aware of injustices surrounding social justice conflicts, the likelihood of social change occurring increases because of children’s exposure to issues of injustice. Preservice teachers and their future students must cultivate outlooks celebrating diversity and nurturing empathy, self-awareness, critical thinking, and creative problem solving to grapple with these issues. Findings include similarities in the learning pathways of both preservice teachers and their students as they develop their own worldview and an engagement with social justice issues, and the ease with which social justice topics and conversations can be infused into PreK-4 curriculum.

143 The Experience of Occupational Therapy Students Working With Homeless Mothers
Madeline Zarger, Lani Zangara, Meredith Karavolis
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Audrey Kane, Ph.D., MS, OTR/L

A B S T R A C T:
We completed Community-Engaged Learning at Healthy Start House in Duquesne, PA. Healthy Start House is a transitional housing facility for homeless mothers and their children. The Healthy Start House staff work with the mothers to improve skills such as budgeting, time management, parenting, budgeting, menu planning, and shopping. As occupational therapy students working with this population, we address leisure skills, self-expression, social skills, functional life skills, problem solving, and professionalism. The focus of our presentation will be to discuss the intervention plans the we developed based on the women's needs and sessions that we completed with the women. We will provide examples of strategies that may be helpful for other populations with similar needs.

144 The Right SpOT
Maggie Betschart, Chase Ratliff, Abigail Catalano, Will Gu
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Audrey Kane, Ph.D.

A B S T R A C T:
Blind and Vision Rehabilitation Services of Pittsburgh (BVRS) is a local facility that serves those with a primary diagnosis of intellectual disability, accompanied by a visual impairment. This facility serves a low vision population by providing a myriad of services, such as: personal adjustment to blindness training, adaptive technology training, senior safety and adaptive equipment training, employment training, and community transition programs for the youth and elderly. The overarching mission for all of BVRS’s (2016) programs is “independence through rehabilitation”, which is in line with the American Occupational Therapy Association’s (2014) mission statement: “Achieving health, well-being, and participation in life through engagement in occupation”. Unfortunately, occupational therapy services are currently only directly provided to individuals in the personal adjustment to blindness training program, though many of the other programs serve populations with functional independence goals as
well. Expanding occupational therapy services specifically to the employment transition program, will provide this cohort with the clinical expertise, theoretical knowledge, and evidence-based practice that is currently absent from the program. Through community engaged learning, we have identified needs particular to clients in this program. Our poster aims to introduce the value of OT services to this population.

145 The Role of OT in the Homeless Women Population
Jessica Franco, Kara Cicuto, Renae Fichter
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Audrey Kane, Ph.D.

Abstract:
This poster presentation will focus on the needs of homeless women and how occupational therapy could support these needs. Our group has specifically looked at Bethlehem Haven Women's Shelter, and assessed the areas of occupational deprivation that affect their daily living and overall quality of life. Our presentation will explain these concerns, and address how occupational therapy could benefit this population.

146 The value and need for occupational therapy services for ex-offenders in re-entry services
Myriah Kingston, Marissa Rakow, Meredith Taylor
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Audrey Kane, Ph.D.

Abstract:
The purpose of this presentation is to identify the value and need for occupational therapy (OT) services for ex-offenders utilizing transitional services or living in halfway houses. Often times, ex-offenders experience social stigma and barriers to engagement in occupations that limits them the opportunity to experience typical society after prison release. Duquesne University’s 4th year OT students integrated intervention programs once a week for five months into the Renewal: Lifeskills program located in downtown Pittsburgh to develop the psychosocial skills of this population and reduce the occupational deprivation they experience. These intervention sessions incorporated issues such as self-expression, leisure, and social skills. The OT students have identified limitations experienced by this population such as lack of access and social stigma that results in occupational deprivation. The students hypothesize that if an OT implemented services consistently at this site, there would be a significant benefit to the ex-offender populations’ reintegration back into society.

147 Using the Model of Human Occupation to Frame the Perspectives of Homeless Women Experiencing Mental Health Issues
Emily Boring, Mary Ames and Meghan Roach
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Audrey Kane, Ph.D.


**ABSTRACT:**
This presentation is designed to examine the perspectives of homeless women with mental health issues in the context of Occupational Therapy. As an ACOTE requirement, M.S. OT students must complete a clinical fieldwork experience working directly with individuals in a community based setting. Students used the unique perspective of occupational therapy to examine women diagnosed with mental illnesses functioning in the context of the Model of Human Occupation (MOHO). MOHO views the individual as an open system, reacting and adapting to the environment in terms of intrinsic subsystems. MOHO studies how an individual’s volition, habituation, and performance skills affect functional participation in meaningful activity. MOHO offers therapists specifically designed evaluation tools and intervention techniques that serve to examine an individual as a holistic being and can work to inform therapists about this population’s unique perspective.

**148 "Miss Represented" - Theater, Media, and Interpretations of Feminism**
Ann Therese Lambo
Sophomore | Speech Language Pathology | Rangos School of Health Sciences
Faculty Advisor: Deborah Durica, Ph.D.

**ABSTRACT:**
Theater is one of the earliest forms of public media. Performance is a medium through which social issues can be explored in-depth without fear of repercussion or judgment, especially due to its “fictional” nature. Performance allows its participants, both actors and audience members, to become something they are not. In the 21st century, this same performative aspect is present in everyday life, through media portrayals of celebrities and the illusive aspects of social media. These representations are dominated by a constant representation of the woman - how she should look and behave, what she should do, etc. Contemporary theater does an excellent job of presenting the social constraints that we tend to put on women when it comes to their jobs, their appearance, and their social, economic, and class relations with others. I will explore the modern portrayal of feminism in both contemporary stage and media, especially how those two mediums interact through the central themes of The Heidi Chronicles by Wendy Wasserstein, The Waiting Room by Lisa Loomer, Top Girls by Caryl Churchill, and How I Learned to Drive by Paula Vogel.

**149 “Stateless Nation”: The effects of the Algerian War and subsequent French decolonization on Pied-Noir community and identity.**
Corey Fischer
Sophomore | English Writing (History Minor) | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Charles Steinmetz, Ph.D.

**ABSTRACT:**
As anticolonial sentiment grew in Algeria in the 1950s and early 1960s, the ethnic French population throughout the region was caught in the crossfire of one of the bloodiest conflicts for independence in all of Africa. The French Algerian, or Pied-Noir, population numbered close to one million, and was
forced into hiding and eventually to flee their homeland as the war raged on and independence proclaimed. This study examines the effect of the Algerian War and Algeria’s independence on the Pied-Noir population as they struggled to stay safe and later struggled to acclimate to the environments they fled to. Research and information are compiled through scholarly historical accounts and examinations of Pied-Noir biography and literature and of the Algerian War itself. An analysis of Pied-Noir sentiments and experiences during this period show that Algerian independence was a trying time, and that without a homeland the Pied-Noir way of life struggled to survive. Reexamining the effect of decolonization on the native French Algerians examines the consequences of decolonization in a new light, as existing ethnic European populations are often overlooked. In exploring a standardly ignored piece of French and Algerian histories, this project will shed light onto the deep connections that once existed between the two nations and the consequences of cutting that cord.

150 Effects of Pornography Viewing On Relationships: A Philosophical Approach

Andrew Dougher
Freshman | Accounting | A.J. Palumbo School of Business Administration
Faculty Advisor: Kathleen Roberts, Ph.D.

ABSTRACT:
With easier accessibility, pornography use has seen a sharp increase. This project will present the effects of viewing pornography on the viewer’s commitment to romantic relationships. Basis for conclusions are drawn from an experiment conducted by Lambert and Negash of Florida State University. These findings are complemented by a philosophical view of love expressed through Pope Benedict’s Deus Caritas Est. A correlation is developed between the research survey and the Pope’s teachings. This helps to create a better understanding to a topic that is not commonly known.
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