The 3rd Annual Graduate Student Research Symposium

Friday, November 6, 2015
Power Center Ballroom
Duquesne University

Sponsored by Academic Affairs, Office of the Provost, and Office of Research.
The third annual
Graduate
Student
Research
Symposium

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ACKNOWLEDGEMENTS

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

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

GSRS Student Planning Committee:
Barbara Postol | Daniel Hannah | Ian Butcher | Paul Cacolice
Ian Shadle | Julie Michael | Lisa Enright | Siyun Zhou | Amanda Griffin

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

Bayer School of Natural and Environmental Sciences
Center for African Studies
Center for Catholic Intellectual Tradition
Center for Spiritan Studies
Enrollment Management Group
McAnulty College and Graduate School of Liberal Arts
School of Nursing
Office of the Provost
Office of Research, Christine Pollock and Mary McConnell
Phi Kappa Phi, National Honors Society
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<th>Time</th>
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<tr>
<td>8:30 to 10:00 a.m.</td>
<td>POSTER PARTICIPANT SET-UP</td>
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<tr>
<td>10:00 a.m.</td>
<td>DOORS OPEN TO THE PUBLIC</td>
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<td>Opening Remarks</td>
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<tr>
<td>10:00 to 11:00 a.m.</td>
<td>OPEN POSTER SESSION - Power Center-Section C</td>
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<td>Guests are invited to walk around, peruse student projects and engage with students.</td>
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<tr>
<td>11:00 a.m. to Noon</td>
<td>ORAL PRESENTATIONS SESSION 1 - A and B</td>
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<td>Session 1-A- Power Center-Section A</td>
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<td><strong><strong>POSTER SESSION CLOSED AT THIS TIME</strong></strong></td>
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<tr>
<td>Noon to 1:00 p.m.</td>
<td>POSTER SESSION - Power Center-Section C</td>
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<td>Guests are invited to walk around, peruse student projects and engage with students.</td>
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<td>Oral Presenters from Session 1 will be available to answer questions.</td>
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<td>Boxed Lunches provided for participants.</td>
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<tr>
<td>1:00 to 2:30 p.m.</td>
<td>ORAL PRESENTATIONS SESSION 2 – A and B</td>
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<td>Session 2-B</td>
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<td><strong><strong>POSTER SESSION CLOSED AT THIS TIME</strong></strong></td>
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<tr>
<td>2:30 to 3:00 p.m.</td>
<td>SNACK BREAK</td>
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<td>Oral Presenters from Session 2 will be available to answer questions.</td>
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<td>Judges make final decisions</td>
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<td>3:00 p.m.</td>
<td>AWARDS and CLOSING REMARKS</td>
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ORAL PRESENTATIONS – SESSION 1
Power Center Ballroom

SECTION A

11:00 a.m.  Cebrail Karayigit
School of Education - Counselor Education and Supervision
Faculty Advisor: David L. Delmonico, Ph.D.
Abstract Number: 75
The Effectiveness of Homework Assignments in Cognitive Behavioral Therapy for Public Speaking Anxiety: A Case Study

11:00 a.m.  Steven Perry
McAnulty College and Graduate School of Liberal Arts - Theology
Faculty Advisor: Sebastian Madathummuriyil, Ph.D.
Abstract Number: 64
Evangelicals at the Climate Change Crossroads

11:15 a.m.  Ben Mast
School of Education - Department of Counseling, Psychology, and Special Education
Faculty Advisor: Carla Meyer, Ph.D.
Abstract Number: 78
Moving beyond the boat: Using young adult literature to scaffold teacher candidates’ understanding of the immigration experience

11:30 a.m.  Jacob Keeney
Bayer School of Natural and Environmental Sciences – CERE
Faculty Advisor: John Stolz, Ph.D.
Abstract Number: 59
Chronic Toxicity of Crude 4-Methylcyclohexanemethanol to the Crustacean Ceriodaphnia dubia

11:45 a.m.  Michael Afolabi
McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Henk ten Have, Ph.D.
Abstract Number: 34
The Rhetoric of Exploitation in International Clinical Research: An Ethical Consideration

SECTION B

11:00 a.m.  Bethany Kaser
McAnulty College and Graduate School of Liberal Arts – English
Faculty Advisor: Anna Gibson, Ph.D.
Abstract Number: 76
Gender Roles and Miniature Passengers: The Implications of the Victorian Child in Limbo Between the Domestic and Public

11:15 a.m.  Lyndsie Ferrara
McAnulty College and Graduate School of Liberal Arts – Center for Healthcare Ethics
Faculty Advisor: Gerard Magill, Ph.D.
Co-Advisor: James B. Schreiber, Ph.D.
Abstract Number: 72
How Abductive Reasoning Impacts Criminal Investigations

11:30 a.m.  Lu Liu and Michele Herneisey
Mylan School of Pharmacy
Faculty Advisor: Jelena Janjic, Ph.D.
Abstract Number: 60
Pain Nanomedicine: COX-2 Targeted Theranostic Nanoemulsions Redesigned
## SECTION A

### 1:00 p.m.

**Dipy Vasa and Jesse Yu**  
Mylan School of Pharmacy  
Faculty Advisor: Peter Wildfong, Ph.D.  
Abstract Number: 68  
Understanding the thermodynamic stability relationship of ribavirin polymorphs through estimation of transition temperature

### 1:15 p.m.

**Daniel Hurst**  
McAnulty College and Graduate School of Liberal Arts – Center for Healthcare Ethics  
Faculty Advisor: Henk ten Have, Ph.D.  
Abstract Number: 73  
“Right to Try” Legislation: A Complicated Ethical Matter

### 1:30 p.m.

**Lois Schertz**  
School of Nursing  
Faculty Advisor: Mary Loughron, Ph.D.  
Abstract Number: 79  
Evaluation of Liposomal Bupivicaine in Total Knee Arthroplasty

### 1:45 p.m.

**Thomas Wright, Christopher Raybuck and Katheryn Wendekier**  
Mylan School of Pharmacy  
Faculty Advisor: Jane Cavanaugh, Ph.D.  
Abstract Number: 66  
Simultaneous Inhibition of the PI3K/Akt and MEK5/ERK5 Cascades Reduce Proliferation and Migration in Hormonally Diverse Breast Cancer Cell Lines

## SECTION B

### 1:00 p.m.

**Etchi Besem**  
McAnulty College and Graduate School of Liberal Arts – Theology  
Faculty Advisor: Marie Baird, Ph.D.  
Abstract Number: 71  
From the Cross to Holy Orders: Chauvet’s Symbolic Theology and the Sacramental Implication of Women’s Presence on Mt Golgotha in Jn. 19:25-28

### 1:15 p.m.

**AJ Bisesi**  
McAnulty College and Graduate School of Liberal Arts – Social and Public Policy  
Faculty Advisor: Michael Irwin, Ph.D.  
Abstract Number: 69  
A Case Study: Promoting an Equitable Eating-out Food Environment through the Application of a Food Justice Frame

### 1:30 p.m.

**Kevin Lachaud**  
A.J. Palumbo School of Business Administration- ISM  
Faculty Advisor: Wenqi Zhou, Ph.D.  
Abstract Number: 77  
Temporally Pricing low or Spotlighting Your App? : An empirical study on Amazon Free App of the Day

### 1:45 p.m.

**Clement Kanu**  
McAnulty College and Graduate School of Liberal Arts – English  
Faculty Advisor: Marie Baird, Ph.D.  
Abstract Number: 74  
SECTION A

2:00 p.m.  
Jordan Potter  
McAnulty College and Graduate School of Liberal Arts – Center for Healthcare Ethics  
Center for Healthcare Ethics  
Faculty Advisor: Gerard Magill, Ph.D.  
Abstract Number: 65  
An Ethical and Practical Analysis of the Benefits Associated with Compensated Live Organ Donation

2:15 p.m.  
Benjamin Meyer  
Mary Pappert School of Music – Guitar  
Faculty Advisor: Zvonomir Nagy, Ph.D.  
Abstract Number: 63  
Numbers and Proportion in Performing Arts: An Exploration of Musical Space in Stravinsky’s Agon

SECTION B

2:00 p.m.  
Zachary Dehm  
McAnulty College and Graduate School of Liberal Arts – Theology  
Faculty Advisor: Marie Baird, Ph.D.  
Abstract Number: 70  
Can Socially Responsible Investment Create a Preferential Option for the Poor?

2:15 p.m.  
Theresa Sullivan  
McAnulty College and Graduate School of Liberal Arts - English  
Faculty Advisor: Jim Purdy, Ph.D.  
Abstract Number: 26  
“A Vlog Universally Acknowledged,” a digital analysis of “The Lizzie Bennet Diaries,” a vlog adaptation of Jane Austen’s Pride and Prejudice
Bayer School for Natural and Environmental Sciences
Award for Graduate Research-Excellence in Graduate Research:
2 awards, $300 each
Students whose projects fall within the realm of the basic sciences will be considered for this award. Projects are evaluated based upon organization, creativity, clarity and technical content.

Center for African Studies
Award for Graduate Student Research: $300
This award is intended to encourage and reward graduate research in African Studies and related areas that engage Duquesne’s ongoing commitment to Africa. Evaluations are based upon visual presentation, organization, creativity and clarity.

Center for Catholic Intellectual Tradition and Spiritan Studies Award
for Graduate Student Research: 2 awards, $300 each
The aim of this award is to celebrate and encourage graduate research that engages resources in Catholic intellectual tradition in general or Spiritan sources more particularly. One award will be offered for work done in the disciplines of theology or philosophy, and one award will be offered to work done in other disciplines.

McAnulty College and Graduate School of Liberal Arts:
Outstanding Poster or Presentation: $250
The aim of this award is to recognize excellence in the liberal arts. Projects will be evaluated based upon organization, clarity and content.

School of Nursing Award for Graduate Research: $250
Projects to be considered for this award must fall within the healthcare and/or nursing discipline and will be evaluated upon the following: applicability to healthcare/nursing, use of existing research to support and guide project, understanding and application of the principles of research, and effective communication of research and scholarship.

Provost’s Award for Outstanding Scholarship: $250
Honorable Mention: 2 awards, $125 each
Students from all disciplines who are participating in the GSRS will be eligible for these awards. A committee of administrators and faculty will judge posters and oral presentations based on intellectual merits and demonstration that the research presented meets the stands for its field.

Phi Kappa Phi, National Honors Society
Outstanding Research Award: $500
Honorable Mention: 2 awards: $250 each
Research projects from all disciplines will be eligible for these awards. The awards serve to recognize outstanding scholarship across all disciplines in the university. They will be given to a student or students who demonstrate exceptional scholarship through either poster or oral presentation.
1 An N-methylated Tetrapeptide from a Panamanian Cyanobacterium with Antitrypanosomal Activity
Kh Tanvir Ahmed and Kevin J. Tidgewell, Ph.D.
Medicinal Chemistry | Mylan School of Pharmacy
Faculty Advisor: Kevin Tidgewell, Ph.D.
Poster

American trypanosomiasis or Chagas’ disease is caused by the protozoan Trypanosoma cruzi. It is a vector-borne neglected tropical disease, which is endemic in 21 Latin American countries. At present about 6 to 7 million people are estimated to be infected with this parasite, which imposes a large economic burden in this region where poverty is widespread. Despite being endemic to Latin America, population migration has brought this disease to the USA, Canada, Europe and Western Pacific countries. There are two stages of the disease, acute and chronic. The chronic phase is more severe, where major organs are invaded by the parasite leading to neurological disorders, intestinal damage, and fatal cardiomyopathy. This phase may appear a decade or more after the initial infection. Effectiveness of available therapeutics is limited by serious side effects, reduced effectiveness in the chronic phase and long term therapy. Lack of significant financial return has resulted in less emphasis on drug discovery programs for antiparasitic agents. Therefore, specific treatments to cure American trypanosomiasis are still inadequate. Recently, we discovered an N-methylated tetra peptide, naranjamide, by bioactivity-guided fractionation from a Panamanian cyanobacterium. A fraction (A2002H) obtained from the cyanobacterial collection showed 75% inhibition of T. cruzi in in vitro screening. Subsequent purification with HPLC yielded the pure compound, which showed an inhibition of 81.51% of T. cruzi. Structure elucidation was conducting using NMR and MS/MS. To confirm structure and provide more material for mechanism of action studies, a total synthesis of naranjamide has been conducted. The total synthesis and structure elucidation will be presented.

2 Characterization of a novel pathway for phosphatidylcholine biosynthesis in Saccharomyces cerevisiae
Sanket Anaokar, Jana Patton-Vogt, Ph.D., Ida Lager and Sten Stymne
Biological Sciences | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jana Patton-Vogt, Ph.D.
Poster

Glycerophosphopholipids (phospholipids) are essential components of biological membranes. Several metabolic diseases like diabetes, cancer and obesity can cause increased or decreased levels of certain phospholipids in cellular membranes. Thus, the maintenance of membrane composition is crucial to cell functioning. Phosphatidylcholine (PC) is the major phospholipid found in all eukaryotic membranes
The two main pathways by which PC is synthesized are the methylation pathway and the Kennedy pathway (CDP-DAG pathway) (de kroon, 2013). However, a novel pathway has been identified in S. cerevisiae (Stalberg, 2008) and plants (Lager, 2014). This pathway involves glycerophosphocholine (GroPCho), the product of PC deacylation, as the starting substrate. It is proposed that GroPCho is reacylated to lysosphatidylcholine (lysoPC) by accepting an acyl chain. This conversion is catalyzed by an enzymatic activity termed as glycerophosphocholine acyltransferase (GPCAT). The lysoPC is then acylated by lysosphatidylcholine tranferase (LPCT) to form PC (Lager, 2014). Here we report on the identification of the gene encoding GPCAT and the characterization of this novel pathway in S. cerevisiae. In vivo metabolic labeling studies were performed in various strain backgrounds in which the established pathways of PC biosynthesis have been altered and the GPCAT gene was either missing or overexpressed. Our results indicate that the GPCAT gene acts as an GPC acyltransferase in vivo and that this novel pathway contributes to PC biosynthesis in the cell.

3 Investigating the Beliefs of Middle Class African American Parents Toward Urban Education
Candice Aston
School Psychology | School of Education
Faculty Advisor: Scott Graves, Ph.D.
Poster

Educational research has consistently demonstrated the underachievement of African American African children in schools across the United States (Hallinan, 2001). African American students that reside in inner-city communities with predominately working class families are at a higher risk for academic failure. Nationally, African American children have the lowest performance on standardized assessments of academic achievement (Schott Foundation for Public Education, 2008). While there are a multitude of studies that discuss the negative outcomes of African American children from low-income communities, the same cannot be said of the availability of studies that document the schooling experiences of middle class African Americans. Studies show that urban schools benefit from an influx of middle class students and parents because of the resources that accompany them. Schools that have a mix of income levels are more likely to be effective. Middle class parents are characterized as being more involved in their child’s education and more able to contribute to school activities. There has been a growing trend for middle-class African Americans to reside in suburban towns with predominately Caucasian families. In addition, more middle class African American families are electing to send their children to non-urban schools (Alba, R. D., Logan, J. R., and Stults, B. J.,2000). Currently there is a lack of research that document the specific reasons why middle class African Americans are choosing non-urban schools for their children. This study seeks to uncover the beliefs that middle class African Americans hold towards urban education. In addition, this study aims to investigate the factors that affect where they send their children to school. Qualitative data were obtained from a subsample of participants who participated in individual interviews that aimed to explore personal narratives of the participants regarding school choice. Based on qualitative analysis, several critical themes arose regarding beliefs toward urban education.
4 Taxidermy and Dioramas: An Art Alive in Purpose and Potential
Adrienne Berndt
Public History | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Michael Cahall, Ph.D.
Poster

Taxidermy and dioramas provide more than meets the eye in museums. If museums remain conscious of their past and invest in their future the medium’s assets will instead become visible. Examining why they were created and what functions they served reveals the reasons why taxidermy and dioramas remain a prominent fixture to museums worldwide. It also shows the progression of how the visitor views these pieces over time even if the works themselves do not change. Messages, goals, and viewing enjoyment often become lost in scientific and technological advancements. Though advancements, often perpetuated by taxidermists, challenge the use of taxidermy and dioramas in museums they also hold the potential to push the efficacy and impact of the medium further. Exposing taxidermy’s role in developing public education of scientific classification, animal behavior and environments, culture’s interaction with and place in the environment, school education programs, development of new media in viewing nature, preservation of extinct and endangered animals, conservation, and even national identity would connect the visitor to a more educational, engaging, and enriching experience. Unfortunately these opportunities often lie underutilized within the museum. Taxidermy and dioramas showcase neglect, with their departments increasingly receiving job cuts and limited funding. Ignoring this medium’s past not only makes for a disengaging visitor experience but sometimes a detrimental one. Neglected pieces occasionally portray incorrect animal behavior, a trait that with text providing context a museum could easily turn into an educational asset exhibiting scientific advancement. If museums themselves lose interest in the potential of taxidermy and dioramas why make visitors view dead animals, when you can see them live through zoos and film? Applying history reveals that taxidermists helped to pioneer these new mediums and used their craft to supplement them. With history, museums hold the potential to make the dead alive in purpose.

5 Female Juvenile Offenders: Influence of Trauma and Relational Aggression
Cassandra Berbary, Sareska Tomayo, Rebecca Fritsch and Tammy Hughes, Ph.D.
Counseling, Psychology and Special Education | School of Education
Faculty Advisor: Tammy Hughes, Ph.D.
Poster

In 2011, law enforcement agencies made nearly 1.5 million arrests of people under the age of 18, representing a 31% decrease since 2001 (Office of Juvenile Justice and Delinquency Prevention, (OJJDP, 2013). Interestingly, although the overall arrest rate has decreased for juveniles in the United States, the female arrest rate has increased nearly 66 percent over the past two decades (OJJDP, 2010). Indirect aggression, a form of bullying, has been found to be more common among females than males (Crick and Grotpeter, 1995) and may be an unconsidered contribution to the aggressive acts shown in delinquent girls. Indirect aggression refers to more covert types of bullying, including excluding others from social activities, damaging others’ reputation through spreading rumors or gossipping, and
withdrawing friendship as a source of punishment (Crick and Groteper, 1995). An additional obstacle to the treatment of female offenders is the presence of previous traumas, which has been closely linked to both physical/overt aggression as well as indirect aggression. Aggression in female offenders has not been as widely studied as aggression in male offenders (Crain et al., 2005). Aggression treatments for offenders are most commonly designed for use with male populations; therefore, the current study specifically targets female offenders in order to expand the intervention knowledge base. It is imperative for service providers to understand the need for gender-specific treatments for juvenile offenders, as most interventions focus on only overtly aggressive, antisocial, and criminal behaviors for male offenders. Attendees will gain an understanding of the influence of relational aggression and trauma upon female juvenile offenders and learn what services providers can do in order to aid the treatment process for female juvenile offenders.

6 The effect of melatonin upon post-acute withdrawal among males in a residential treatment program (M-PAWS)
Corry Bondi, Ph.D. and Paula Witt-Enderby, Ph.D.
Pharmacy Administration | Mylan School of Pharmacy
Faculty Advisor: Vincent Giannetti, Ph.D.
Poster

Substance abuse is a public health crisis that impacts families, communities, as well as contributes to various social problems. The economic burden is high with cost estimates of over $400 billion in lost productivity, crime and health care with over $36 billion related to health care costs alone. Individuals in recovery experience post-acute withdrawal symptoms (PAWS) that include anxiety, sleep disturbances, depression, and stress. Because of the symptomatology of post-acute withdrawal, melatonin therapy may be beneficial to those experiencing these symptoms. Previous studies provide evidence that melatonin therapy was beneficial to alleviate anxiety, depressive symptoms, sleep disturbances, and stress. However, no randomized, double-blind, placebo controlled trials using melatonin have been conducted in males who are experiencing PAWS. Orally administered melatonin is well tolerated, has few, if any, adverse effects on liver and renal function and has no abuse potential. Because of its lack of abuse potential, melatonin may be an appealing therapeutic option for individuals in whom conventional hypnotic drugs would be problematic. The goal of this research is to incorporate the addition of melatonin to the current treatment program of males who are in a residential treatment program for drug and alcohol abuse. The purpose of this study is to investigate the effect of 5 mg melatonin given nightly for four weeks on weekly assessed, self-reported anxiety, depressive symptoms, insomnia, and stress using a randomized clinical trial design in males with PAWS who reside in a residential treatment center.
7 Using Genomics to Explore Diversity and Adaptation among Tiger Subspecies
Jennifer Broderick, Sarah Sprauer (Undergraduate) and Brian Davis, Ph.D.
Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jan E. Janecka, Ph.D.
Poster

The tiger (Panthera tigris) is an iconic species in need of ex situ and in situ conservation initiatives. Tigers are now extinct in several regions and the remaining populations have been greatly reduced and isolated. However, captive tiger populations are thriving, and are believed to harbor more individuals and diversity than their wild counterparts (Luo et al. 2008). These large captive tiger populations provide an opportunity for understanding genome diversity and evolutionary mechanisms that have shaped this species. We will use these captive populations to compare the genomes of tiger subspecies to identify unique molecular adaptations that may distinguish them and lead to their differences. We are initially focusing this study on the Bengal tiger (P. t. tigris), the Amur tiger (P. t. altaica), and the Sumatran tiger (P. t. altaica). These have been selected because they are among the most phenotypically divergent as well as geographically separated subspecies. In addition, the majority of the zoo population is composed of tigers that belong to one of these three subspecies. To generate genome-wide data, we are performing double digest restriction-site associated DNA sequencing (ddRADSeq) on representative individuals. We are currently optimizing this method for tigers and are sequencing samples on the Illumina platform. Based on previous research, this method will generate genotypes for 20-30,000 loci distributed across all chromosomes. Single nucleotide polymorphisms (SNPs) will be genotyped and we will explore the patterns of variation across the genomes of each subspecies. The divergence (Fst) of different linkage groups, stretches of homozygosity, and linkage disequilibrium will be used to detect which genomic regions are likely under selection. We will then use the available tiger genome and annotation to identify candidate genes within those regions that contribute to differences between subspecies and local adaptation.

8 Exploring Home: Urban Women's Experiences in a Ruptured Community
Elizabeth Brown
Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Lori Koelsch, Ph.D.
Poster

Root shock is conceptualized as a “traumatic stress reaction” in response to significant community upheaval (Fullilove, 2004). In the mid-20th century, a predominantly African American section of downtown Pittsburgh, known as the Hill District, was completely demolished in order to clear space for the city’s Civic Arena (Evans, 1943). The demolition was part of broader urban renewal attempts across the country (Deitrick and Ellis, 2004), and it forced the displacement of nearly 8,000 people (Fullilove, 2004). According to Fullilove (2004), a rupture on this scale results in a profound loss of community that is both traumatic and longer-lasting than we may currently understand.

As part of an ongoing project in collaboration with FOCUS Pittsburgh, a non-profit organization located in the Hill District, the author worked with semi-structured interview data to explore the role of
community in participant descriptions of meaningful life events. Through analysis employing a feminist research method, the Listening Guide, contrapuntal voices of home and homelessness emerged. The author conceptualizes the “home voice” as representative of a sense of belonging; analysis reveals this in attachment to geographical place, as well as to specific people and God. Of particular interest in this study is the participants’ sense of home and belonging as expressed in relationships and faith. The author includes analysis of “I statements” in the form of poetry, and broader implications for interpersonal and community healing are discussed.

9 Method Development and Optimization for the Combined Analysis of Synthetic Cannabinoids and Designer Cathinones in Urine
Holly Castellano
Chemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Stephanie Wetzel, Ph.D.
Poster

In recent years, synthetic cannabinoids and cathinones have been designed to mimic the intoxicating effects of Δ9-tetrahydrocannabinol (THC) and amphetamines, respectively. In order to skirt existing drug laws, non-controlled ingredients are used, and the original chemical structures of current drugs are being modified using analogs or derivatives. These continually changing chemical compositions pose a problem for policymakers, and forensic and analytical scientists, as users are able to attain a “legal high” and avoid detection in standard drug screens. A liquid-liquid extraction (LLE) process was developed and optimized that utilized concentrated hydrochloric acid and potassium hydroxide, and chlorobutane in separate steps to displace the acidic cathinones and basic cannabinoids into the organic phase. A single method of analysis was developed to analyze both cathinones and cannabinoids using Liquid Chromatography-Triple Quadrupole-Mass Spectrometry (LC-QQQ-MS), comparing Atmospheric Pressure Chemical Ionization (APCI) and Electrospray Ionization (ESI) sources. Calibration curves were constructed by plotting the peak area/internal standard peak area versus the concentration for cannabinoids and cathinones using APCI and ESI. APCI cannabinoids (JWH-073) had much higher R² values (0.9464 and 0.9858) than ESI cannabinoids (0.1605 and 0.7784). ESI cathinones (MDPV) had higher R² values (0.7603 and 0.809) than APCI cathinones (0.5955 and 0.6775). The uncertainty values associated with the calibration curves were comparable across both sources. According to the data, LC-APCI-QQQ-MS was more sensitive to cannabinoids and LC-ESI-QQQ-MS was more sensitive to cathinones. Additionally, a novel LC-QQQ-MS method was able to analyze both cathinones and cannabinoids in the same sample, as a result of the developed LLE method.

10 Teachers’ Perceptions and Knowledge of the Bullying Experiences of LGBTQ Students
Suzannah Chatlos, Cassandra Berbary and Latitia Lattanzio
Counseling, Psychology, and Special Education | School of Education
Faculty Advisor: Laura Crothers, D.Ed., NCSP
Poster

In order to determine the level of perceived teacher support experienced by LGBT students, 3,652 middle and high school teachers from 42 school districts in a county in southwestern Pennsylvania were
contacted to complete an online survey assessing their perceptions and experiences regarding the bullying of LGBT students. Responses were obtained from 201 teachers who completed the survey, which included questions regarding teachers’ perceptions of their schools’ climate, student safety, and the frequency to which teachers are made aware of LGBT bullying victimization.

Correlational and inferential statistics suggest that, while teacher supportiveness is generally related to more positive perceptions of the school environment, the relationship between supportiveness and aggression appears complex. Results indicate a significant positive relationship between the teachers’ perceptions of the supportiveness of school staff towards students regardless of sexual orientation and those teachers’ reports of the frequency of bullying victimization experienced by LGBTQ students. Teachers’ perceptions of a higher level of support was associated with higher reported frequencies of students’ use of derogatory language about LGBTQ individuals and various types of bullying of LGBTQ students. Teachers with an LGB orientation were found to rate the school staff and students as significantly less supportive of students regardless of their sexual orientation, gender identity, or gender expression in comparison to heterosexual teachers. The relevance of significant results and implications for intervention and education with staff and students will be discussed.

11 Healthcare utilization and costs amongst employed adults with Chronic Obstructive Pulmonary Disease (COPD): a retrospective analysis of the Medical Expenditure Panel Survey

Ankur Dashputre
Pharmacy Administration | Mylan School of Pharmacy
Faculty Advisor: Jordan Covvey, Pharm.D., Ph.D., BCPS
Poster

Chronic obstructive pulmonary disease (COPD) is a progressive lung disease characterized by increasing breathlessness, affecting an estimated 13.7 million individuals in the USA. Although research commonly focuses on older individuals, patients with COPD prior to work retirement may face loss of productivity and significant healthcare utilization costs resulting from their disease. The study objective was to describe the healthcare utilization and costs amongst employed adults with COPD. Employed adults (-18 years) with a self-reported diagnosis of COPD were retrospectively identified from the 2012 Medical Expenditure Panel Survey (MEPS) database and stratified into two separate groups: (1) those who reported no missed work, and (2) those who missed work due to their COPD. Descriptive statistics were utilized to assess the differences between the groups on demographics, clinical characteristics and healthcare resource utilization. Additionally, healthcare utilization costs (2015 dollars) were quantified for office-based, emergency, inpatient, outpatient, home health visits and prescription medicine use. Analysis was performed using Statistical Analysis System 9.4 software (SAS Institute; Cary, NC). A total of 266 patients were identified from the survey based on the inclusion/exclusion criteria: group 1 (n=124) and, group 2 (n=142). For the unweighted data, there was statistical significance across the groups for gender (p=0.01), and income (p=0.03). No statistical significance was found between the groups for healthcare utilization and the median healthcare visits. Healthcare costs associated with missed work due to COPD were estimated to be $1.8 billion with a cost of $1,271 per person compared to $0.9 billion (with a cost of $664 per person) among those who reported no missed work. Absenteeism due to COPD
seems to be associated with higher healthcare costs. Use of evidence-based interventions focusing on COPD management may decrease the costs attributable to absenteeism.

12 Exploring differences in seminal plasma proteomes among hominids
Amanda Colvin, Thomas J., Chovanec P. and Basu P.
Biological Sciences | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Michael Jensen-Seaman, Ph.D.
Poster

Humans (Homo sapiens), chimpanzees (Pan troglodytes), and gorillas (Gorilla gorilla) have differing mating systems with varying levels of sperm competition. Several seminal plasma genes have been claimed to evolve under positive selection and others altered or lost. This study aimed to identify biologically relevant similarities and differences among seminal plasma proteomes in relation to primate mating systems and previous genomic studies. Through 1D and 2D gel analysis the complexity of proteins visually differs among species. Seminal plasma from three individuals of each species were run in triplicate in shotgun liquid chromatography – tandem mass spectrometry (LC-MS/MS); 8,960 peptides were identified across all individuals. Five hundred and twenty-four proteins were identified overall. Only 63 proteins were shared between two or more species. Gorillas have vast intraspecies variation among proteomes. Immunoblot detection of the prostate-specific transglutaminase (TGM4) verified LC/MS-MS and previous genomic studies. Chimpanzees have approximately 7.7 fold higher TGM4 expression than humans, and TGM4 was not detected in gorilla, supporting possible pseudogenization. The structural protein SEMG2 was detected in one of three gorilla individuals through immunoblot detection, and in all three human and chimpanzee individuals. Overall, hominid seminal plasma proteomes differ greatly, which may be related to differences in sperm competition and support previous genomic study predictions.

13 Examining Service and Educational Needs of Chinese Families with a Child with Autism: Parents’ Perspectives
Xiaohan Chen
Ph.D. Special Education | School of Education
Faculty Advisor: Ann X. Huang, Ph.D.
Poster

Statement of the Research Questions

This study is proposed to answer the following two research questions:

1. What are the Chinese parents’ needs in terms of therapeutic services and/or educational supports for their child with ASD?

2. What are the differences in perceived need areas between Chinese parents living in the United States and those who are living in the People’s Republic of China?

This study investigates Chinese parents’ perspectives on therapeutic services and educational needs of their child on the spectrum, and makes a comparison of needs between parents of children with ASD
living in China and those who are living in the United States. We aim to share our insights and findings with service providers and/or educational professionals in the field, so that children with ASD and their families coming from a different cultural background can be understood better and can have better access to the services or supports they really need in school settings or in the community in both countries.

This project will employ an online survey to collect data. The survey will be developed based on the existing research literature. Four need areas are identified and under each need areas there are four items. To collect data in the United States, the survey will be uploaded to www.surveymonkey.com, a professional commercial website designed to administer online surveys and collect anonymous data. It has a secure server with 128 bit encryption. The link to this survey will be distributed via email to our targeted participants, and data (the responses of our participants) will be collected by the website and stored in its database. To collect data in China, a Chinese version of the same survey will be used.

**14 Braddock and the Pittsburgh Region**

Gina DelGreco

Public History | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Michael Cahall, Ph.D.
Poster

In 1940 Braddock had a population of 18,326, 70 years later the population was only 2,159 people—a total population decline of more than 90 percent.

Braddock’s original industry was steel, and the U.S. Steel owned Edgar Thompson Works, generated jobs for residents of the community. As steel grew, so did businesses, which created a booming local economy. When steel declined, Braddock did as well—by the year 2000, 2,855 people were living in poverty out of 2,912 people. The residents that could leave, did, opening up opportunities for other towns to create shopping centers and malls, increasing the income gaps between residents in Braddock and the surrounding Pittsburgh area.

The collapse of the steel industry and the supporting businesses partially caused the decline of the borough, but other factors including limited income and a lack of sustainable work as well as a high rate of poverty prevented Braddock’s economic success. Jobs left the area, taking away a means of disposable income, creating a larger divide between suburbs and steel towns, and increasing the income gap and the high rate of poverty.

In 1988 Braddock was classified as a “distressed municipality,” to remove this classification Braddock implemented programs such as Braddock Redux, a non-profit group providing sustainable programing to revitalize the area. The Braddock Promise gives graduating high school seniors a chance to attend higher education institutions.

In order to rebound, solutions may include, diversifying markets that are accessible to members of the community, and rebuilding with financial and community support. For Braddock and other steel communities, programs and local support might challenge low poverty and income rates, further
benefiting the area. Policy makers cannot plan urban projects without considering how it might affect local and regional residents. Communities should grow with their residents rather than further displace them.

15 **Gregorian Chant**
Maura Goodwin
Sacred Music | Mary Pappert School of Music
Faculty Advisor: Ann Labounsky, Ph.D.
Poster

This poster project will look at the history of Gregorian Chant and how it has developed through time. It will also look at its modes and how it has influenced modern music as well as how this music is suitable for the Catholic religion.

16 **Shoulder Strength Profiles in Those With and Without Scapular Dyskinesis**
Daniel Hannah, Jason S Scibek, Ph.D., LAT, ATC and Chris R Carcia, Ph.D., PT, SCS, OCS
Rehabilitation Science | Rangos School of Health Sciences
Faculty Advisor: Jason Scibek, Ph.D., LAT, ATC
Poster

Muscular weakness of the shoulder has been demonstrated in individuals with scapular dyskinesis (SD). The majority of studies have focused on symptomatic patients; however, little is known regarding muscular performance in healthy individuals with SD. The aim of this study was to compare strength measures of the shoulder between healthy individuals with and without SD. Forty healthy, college-aged participants without any history of dominant shoulder pathology were recruited. We elected to conduct a matched-pairs analysis due to disparity in the number of individuals that presented with SD (27/40) versus those without SD (13/40). Participants were matched based on sex and BMI resulting in 13 matched-pairs. The presence of SD was determined using the scapular dyskinesis test. We utilized the yes/no method to categorize those with and without SD. Strength of the scapula stabilizers and rotator cuff was assessed via manual muscle testing using a handheld dynamometer. Additionally, strength ratios were calculated and analyzed. Differences in strength and strength ratios between those with and without SD were compared using separate two-way mixed ANOVAs with repeated measures with an alpha level of .05. No significant differences (p > .05) were observed for the SD group main effect or the interaction between strength and SD. A significant main effect (p < .01) was revealed for strength indicating differences between several of the muscles tested. Post-hoc analysis revealed trends that resulted in a generalized order of the muscles from strongest to weakest: upper trapezius, followed by serratus anterior and middle trapezius, lower trapezius, supraspinatus, medial rotators, and lateral rotators. No significant differences (p > .05) were observed when comparing strength ratios and SD. Our results indicate that differences in shoulder muscle strength do not exist in healthy subjects with and without SD. Additionally, SD appears to be commonly found in healthy populations.
**17 GoodScholar: A Digital Research Assistant for the Web 3.0 Age**

Theresa Hoffmann, Ashley Cook and Justin Fanzo  
English | McAnulty College and Graduate School of Liberal Arts  
Faculty Advisor: James Purdy, Ph.D.  
Poster

This project is a sales pitch for GoodScholar, a research assistant app that is a mix between Google Scholar and Goodreads. We believe it would be beneficial for scholars to have an app that could offer them recommendations for research materials using a system akin to Goodreads. Goodreads is great for finding and organizing books for pleasure reading, but is rather ineffective for scholarly research. On the other hand, Google Scholar provides a useful tool for conducting scholarly research, but doesn’t offer personalized recommendations for scholars to expand their horizons. It also offers only limited research organization tools. As graduate students attending school in the Web 3.0 age, we feel we have unique insights into the kinds of digital writing tools scholars would like to have access to, and we hope to fill a gap in the market with the proposed app.

This project consists of multiple research components as well as mock-ups of the app itself. In order to understand what digital writing tools are already out there, we examined a few different applications and websites including Goodreads, Google Scholar, Easybib, and Zotero. We conducted a survey of our fellow English Graduate students here at Duquesne to assess what kinds of digital writing tools they currently use and to gauge potential interest in an app like GoodScholar. The mock-ups of GoodScholar consist of wire frames and sample screenshots. Our research led us to formulate an idea for an app that is not exclusively a citation generator or search engine, but an amalgamation of several writing tools that streamline the writing and research process.

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**18 Scales as Biogeochemical Tags in Tracking Environmental Exposure in Western Pennsylvania Fishes**

Laura Howell and Brady Porter, Ph.D.  
Biology | Bayer School of Natural and Environmental Sciences  
Faculty Advisor: Brady Porter, Ph.D.  
Poster

Trace elements incorporated into fish scales have been used to answer questions about the geographic origin and movements of fishes in both freshwater and saltwater environments. Because scales store a record of the elements these fish encounter throughout their lives, scales are a repository of information about aquatic environments. Unlike stable environments, the composition of Pennsylvania stream waters may challenge fishes due to local elemental variability. Such variation can be difficult or costly to qualify. Sources for variation include seasonal effects and both chronic and acute pollution events. Pennsylvania has over 2,300 stream miles that have impacts from abandoned mine discharge (AMD). Use of salts on roads in winter impacts steams through seasonal runoff. In 2008 the initiation of hydraulic fracturing gas extraction in Pennsylvania raised concerns about the possible influx of effluent from drilling sites into waterways. This produced brine may contain unusual elements like strontium and barium at ratios more typical of oceans than freshwater. Here, scanning electron microscopy (SEM) was
used to detect changes in elemental composition in fish scales from controlled experiments. Pimephales promelas (fathead minnow) were exposed to road salt, AMD and to ratios of elements to mimic hydraulic fracturing produced water. Their scales were utilized to detect these exposures and evaluate variation in elemental exposure over time. Through this novel application of SEM, we provide a new tool for resource managers to assess the impacts of the influx of pollutants and environmental variability on stream life to include both chronic exposures and pulses of acute exposure.

19 Early Speech Sound Development in Children with Childhood Apraxia of Speech and Other Speech Sound Disorders
Nicole Hill, Molly Dienno, Katherine Romanyszyn, Carly Sommer and Susan Caspari
Speech-Language Pathology | Rangos School of Health Sciences
Faculty Advisor: Megan Overby, Ph. D., CCC-SLP
Poster

Childhood apraxia of speech (CAS) is a pediatric neurological speech sound disorder (SSD) which impairs the motor planning skills for intelligible speech. The condition is genetic and so difficulties with intelligible speech should be manifested in children’s early speech sound development. CAS is difficult to diagnose before the age of 2 because there is little research to distinguish it from other SSDs. The purpose of the current single-case study investigation was to compare the early speech sound development (birth to age 2) in children with typical speech sound development (TD), CAS, and non-CAS SSD.

Method: Eight monolingual, White (Non-Hispanic) English-speaking children (ages 3-9) were evaluated with standardized speech-language tests and an adaptation of the Mayo pediatric assessment of speech motor control. Three children were diagnosed with CAS, three with non-CAS SSD, and two as TD. Parents then volunteered home videos of the participants between birth and age 2.

Vocalizations (6752 total) from the home videos were coded as either nonresonant (not recognizable as English sounds) or resonant (English vowels, consonants, and consonant-vowel sequences transcribable using the International Phonetic Alphabet).

Results: Data were analyzed per minute of video for each participant and averaged by group (CAS, SSD, or TD). Compared to the other two groups, the CAS group produced fewer overall vocalizations during the first two years of life. The average number of resonant consonants/minute was least for the CAS group (.62/minute), followed by the SSD group (2.86/minute), and most for the TD group (4.63/minute). The CAS group also demonstrated the lowest consonant diversity (number of different consonants used/minute). The researchers plan to analyze home videos from an additional four participants to increase statistical power.

Conclusions: Results imply there is a potential for speech-language pathologists to differentially diagnosis children with CAS before the age of 2, but additional investigations are needed.
20 A Characterization of Equine Microflora in Response to a High Carbohydrate Diet: Comparing Fecal and Cecal Samples
Matthew Jevit, Josie Coverdale, Christine Warzecha and Jan Janecka, Ph.D.
Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jan Janecka, Ph.D.
Poster

Laminitis is a debilitating disease that affects ungulates, most notably horses. It is characterized by the separation of the dermal and the epidermal layer that connect the distal phalanx, and the hoof wall caused by inflammation. Research indicates that introducing a high amount of structural carbohydrates may cause a shift in gut microflora leading to sepsis and body wide inflammation. Traditionally, gut microflora has been characterized by culturing bacterial species from feces. However, it is possible that fecal and cecal samples possess a different bacterial load and may be inappropriate to identify potential pathogenic species in fecal samples. In order to test this hypothesis, 7 quarter horses were randomly divided into two experimental groups. They were given a low amount of commercial high carbohydrate diet (roughly 0.6% of the horse’s body weight) or a high carbohydrate diet (1.2% of the horse’s body weight). At the end of a 28-day period the experimental groups were given the alternative treatment. Fecal and cecal samples were collected, via a cecal cannulation, on days 1, 2, 3, and 7 of the treatment to track the shift of microflora as the horse’s body began to adapt to the treatment. Bacterial species were identified by amplifying a portion of the 16s ribosomal DNA using the Roche 454 flx platform. The instrument produced a mean of 7,288 reads per sample. These were blasted against the GreenGenes database. We found that fecal and cecal samples possess a very different microbial communities. Among the ten most common genera, we found that fecal and cecal samples share no common species. Additionally, we found that fecal samples exhibit a more drastic change in microflora. After the treatment, fecal samples showed that only two of the most common genera remained in the top ten genera. Cecal samples only exhibited one new genera.

21 Evaluation of outpatient treatment for acute venous thromboembolism (VTE) in patients presenting to an emergency department (ED)
Maeve Kallenbach, Nosarieme Osagiede and Jessica Shupe
Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Molly McGraw, Ph.D.
Poster

Deep vein thrombosis (DVT) management can be done in the outpatient setting, reducing unnecessary hospital admissions. The primary objective of this study was to determine the number of patients diagnosed with DVT in the ED and treated as outpatients. Secondary objectives included: determine the number of patients that could have received outpatient therapy for acute DVT with use of a risk stratification tool, determine the number of patients that could receive treatment with a factor Xa inhibitor, and describe medication prescribing trends for patients diagnosed with acute DVT.

This quality improvement project was conducted via retrospective chart review from January 1, 2014 to January 1, 2015. Patients were included if they were greater than 18 years and had an ultrasound
confirmed DVT. Patients were excluded if they had any of the following: pregnancy, recurrent DVT, active or high risk of bleeding, pain requiring intravenous pain medication for greater than 24 hours, concurrent reasons for hospitalization, creatinine clearance less than 30mL/min, known coagulopathy, thrombotic or bleeding disorder, potential for noncompliance, malignancy, severe liver impairment, severe hypertension (greater than 220/greater than110) or pulmonary embolism. Data was analyzed using descriptive statistics.

Thirty-nine patients met inclusion criteria. Three patients were diagnosed with DVT in the ED and treated as outpatients. According to our risk stratification tool, 15 patients would have been eligible for outpatient treatment. All 15 patients would be appropriate candidates to receive treatment with a factor Xa inhibitor. The most commonly prescribed anticoagulants at the time of discharge included warfarin and rivaroxaban.

In conclusion, 38% of patients diagnosed with DVT in the ED were eligible to receive outpatient treatment with a factor Xa inhibitor. As a result of this quality improvement study, a treatment algorithm will be created to identify appropriate candidates for outpatient therapy with a factor Xa inhibitor.

22 Stripping of the Musical Altars?: The Reformation and the Role of the Organ in Tudor England
Emily Lapisardi
Sacred Music | Mary Pappert School of Music
Faculty Advisor: Ann Labounsky, Ph.D.
Poster

Following Henry VIII's repudiation of the Roman Catholic Faith, the liturgical role of the organ in England was re-evaluated. During the reigns of his two Protestant heirs, Edward VI and Elizabeth I, a decline in organ building and maintenance occurred. However, Elizabeth I was an advocate for the continued liturgical use of the organ in her own chapel, where several of her composers were likely crypto-Catholics. This study explores how the organ was utilized both in the queen's chapel and in ordinary parishes during the Reformation in England.

23 Understanding the role of serotonin receptor subtypes 7 and 2C (5-HT7/2C) in comorbid pain and depression using novel compounds derived from marine cyanobacteria
Neil Lax, Christopher M. Ignatz, Edward J. Hilton, Kh Tanvir Ahmed, Kevin J. Tidgewell, Ph.D. and Benedict J. Kolber, Ph.D.
Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Benedict Kolber, Ph.D.
Poster

Chronic pain and major depressive disorder are widespread conditions in the United States. Interestingly, these conditions often occur comorbidly, with each individual disease amplifying the symptoms of the other. Many medications available on the market today for treating pain or depression
target G-protein coupled receptors (GPCRs), implying that this class of receptors may be involved in the treatment of the comorbidity of these conditions. Our efforts have sought to characterize two poorly understood GPCRs, the serotonin receptor subtypes 7 and 2C (5-HT7/2C), and the role that they play in comorbid pain and depression. Our approach for targeting these receptors uses compounds isolated from filamentous marine cyanobacteria collected from the Las Perlas Archipelago off of the coast of Panama in the Pacific Ocean. Compounds from this cyanobacterial collection show strong affinity for the 5-HT7 and 2C receptors. These compounds were screened for in vivo activity using a series of pain and depression behavioral assays. Compounds were delivered into male C57Bl/6J mice via intracerebroventricular (ICV) cannulas or injections into regions of the brain with high expression of these receptors. Compounds were tested in naïve mice or in mice subjected to a model of comorbid pain and depression, the Spared Nerve Injury (SNI) surgery. SNI surgery involves ligating two of the three branches of the sciatic nerve, the tibial and common peroneal branches, while leaving the third branch, the sural branch, intact. SNI surgery induces mechanical hypersensitivity in the ipsilateral paw (modeling pain) and also induces depression-like behavior. We have found that administration of compounds isolated from marine cyanobacteria induce effects in several standard behavioral assays. Our results suggest that cyanobacteria produce compounds with neural effects that may be useful in understanding pain and depression.

24 Mastery Learning Theory: Assessing the Impact of an Innovative Approach to Educating Nurses to Clinical Competence
Evelyn Lengetti
Nursing | School of Nursing
Faculty Advisor: Rebecca Kronk, Ph.D.
Poster

Purpose: To compare mastery learning to traditional learning when teaching the procedure for inserting an indwelling urinary catheter and the impact on new nurse’s competence and self-regulation practices prior to performing this procedure in a simulated environment.

Context: Mastery Learning as an instructional approach posits that all learners have the potential to achieve mastery provided they have the time required for them to learn at their own pace (Bloom, 1968). Self-regulation strategies are actions performed by the learner to gain knowledge and may be simply seeking and organizing information or as complex as rehearsal or getting assistance from others (Zimmerman and Pons, 1986).

Catheter associated Urinary Tract Infections (CaUTI) are one of the most significant patient safety issues today accounting for 30-40 % of all hospital acquired infections annually (retrieved from http://www.ihi.org/explore/CAUTI/Pages/default.aspx) and (www.ihi.org/offerings/VirtualPrograms/Expeditions/PreventingCAUTI/Pages/default.aspx). Nosocomial urinary tract infections are also reported as a nursing quality indicator by the American Nursing Association in that nursing care has a direct impact on the “patient’s well-being” and clinical outcomes.
(Rowell and Milholland, 1998). Inconsistencies in practice may contribute to the infection rates. Standardization and adherence to the procedure may improve patient outcomes and reduce cost.

Study Design/Setting/Participants: This study is a longitudinal quantitative experimental research design conducted in an acute care health system. Participants include new to practice Nurse Residents.

Conclusion: The application of these research findings may reveal a new standard for how nurses are educated to attain and maintain competence and improve patient outcomes

25 Formulation of MOMIPP Nanoemulsions with NIR Imaging Properties
Simai Liu, Simai Liu, Mary Kimmel, Michele Herneisey, Lu Liu and Jelena M. Janjic, Ph.D.*
Biotechnology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jelena Janjic, Ph.D.
Poster

Glioblastoma multiforme (GBM) is one of the most aggressive brain tumors. The blood brain barrier dramatically hinders traditional chemotherapy due to poor drug targeting efficacy.[1] Therefore, GMB is typically treated by surgical excision, followed by radiotherapy and administration of the DNA alkylating agent temozolomide.[2] Though this approach increases survival rate, it is not a curative treatment. New therapeutic approaches are needed. Unlike chemotherapy, which causes apoptotic cell death, methuosis is a new form of cell death mechanism driven by vacuolization in the cancer cell cytoplasm.[3] MOMIPP is a novel methuosis-inducing agent developed at the University of Toledo[3] as a potential new treatment for GBM. However, due to its extremely low water solubility, MOMIPP’s efficacy in vivo may be limited.[4] The goal of this project was to increase the bioavailability of MOMIPP and thus improve its methuosis-inducing properties. We attempted to improve MOMIPP’s bioavailability through the formulation of oil in water nanoemulsions. Our earlier studies showed that synthetic oils such as Miglyol are good carriers for lipid-soluble drugs.[5] In pre-formulation studies, different oil and surfactant combinations were explored and oil/surfactant ratios were optimized to maximize MOMIPP loading into a nanoemulsion. Nanoemulsions were prepared on a microfluidizer and tested for colloidal stability, drug loading, and biological efficacy in a model cell line following earlier reported methods.[6,7] Lipophilic tracer was also added into the nanoemulsions to give them NIR imaging ability. We present here pre-formulation and formulation study results in vitro aimed to improve MOMIPP in vivo anti-tumor efficacy. The study results suggest nanoemulsions demonstrate a strong potential for new anti-tumor drug therapy development.

26 “A Vlog Universally Acknowledged,” a digital analysis of “The Lizzie Bennet Diaries,” a vlog adaptation of Jane Austen’s Pride and Prejudice
Theresa Sullivan, Allison Keene and Maggie Pavlik
English | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Jim Purdy, Ph.D.
Oral Presenter and Poster Presenter
When a text is remixed or remediated, the translation can pose fundamental questions about whether that text has changed, or whether the medium is simply a different way to present the same story. This paper will explore the process of remix and remediation as it appears in “The Lizzie Bennet Diaries,” a vlog adaptation of Jane Austen’s Pride and Prejudice. To best explore the affordances and constraints of the YouTube medium, we will present our analysis of the vlog in a series of web videos.

We will create five videos for our project. The first is a collaborative vlog that details the differences in plot lines and reading tendencies between the novel and the vlog and describes the major trends in the vlog. Our three individual vlogs highlight aspects of the comparison between text and vlog that we find intriguing. Sullivan looks specifically at how the integrity of Austen’s characters fared the remediation. She then draws conclusions on how the vlog says something new about the ways that cultural norms have changed between Austen’s day and the modern day. Pavlick explores plot changes, showing how the vlog translates these themes powerfully for modern viewers. Keene investigates what it means for the characters of “The Lizzie Bennet Diaries” to be conscious participants in the packaging and dissemination of their lives through online video. The final vlog is a Q&A that answers imaginary questions from viewers about our process of creating the vlog, the affordances and constraints of retelling Pride and Prejudice as “The Lizzie Bennet Diaries,” and the place of a vlog like it in the spheres of both digital media and literature.

We believe that this vlog embodies what it means to be a critical consumer of media in an age inundated by digital technology. Ultimately, it proves that remixed and remediated texts capitalize on the affordances and constraints of their various mediums, but translated versions of the same text, such as “The Lizzie Bennet Diaries” and Pride and Prejudice, can still portray the same fundamental message.

27 Water The Organ
Matthew Lobe
Sacred Music | Mary Pappert School of Music
Faculty Advisor: Ann Labounsky, Ph.D.
Poster

The pipe organ can instill many different conceptual thoughts. To one, it can bring about memories of a baseball game. To another, grandma’s house. Or, the organ can remind someone of a significant occasion in their life, whether it be a wedding or a funeral. But to most, the pipe organ brings our mind to the church. And that is definitely where they are seen and heard the most. However, the origin of the pipe organ as we know it today goes much farther back the Christian church. The original organ goes as far back as Alexandria, Egypt in the 3rd century BCE, which was not used for religious purposes, but for social events and gatherings. This primitive organ, called the hydraulis, was water powered, supplying wind to the pipes through natural sources, such as waterfalls, or a manuel pump. Pipe organs developed over time, but the source of power through water still remained an effective and popular source for hundreds and hundreds of years, even being used here in Pittsburgh with the original organs at the Chapel of the Holy Spirit at Duquesne University and First Lutheran Evangelical Church. The purpose of this presentation is to research the development of the water (hydraulic) organ over time, and the influence it imparted on the modern pipe organ we know today.
Effects of combination melatonin, strontium citrate, vitamin D3 and vitamin K2 on osteoblast and osteoclast differentiation grown as co-cultures.

Sifat Maria, Larry Enderby, Holly Lassila, Christine O'Neil and Mark Swanson
Pharmacology | Mylan School of Pharmacy
Faculty Advisor: Paula Witt-Enderby, Ph.D.
Poster

A translational research study, Melatonin-micronutrients Osteopenia Treatment Study (MOTS), was designed to assess the efficacy of combination natural bone tropic agents: melatonin, strontium citrate, vitamin D3 and vitamin K2 (MSDK) on bone health and quality of life in post-menopausal osteopenia. As part of this study, mechanisms underlying MSDK’s effects on bone-forming osteoblasts and bone-resorbing osteoclasts were evaluated using unique co-culture systems containing human bone marrow stem cells (hMSCs) and human peripheral blood monocytes (hPBMCs). Co-cultures were exposed to vehicle, each component (M, S, D or K) alone or combination (MSDK) in either osteogenic (Os+) or growth medium (Os-) for 21 days. Effects of M, S, D and K either alone or in combination on osteoblast and osteoclast differentiation and activity were measured by alizarin red or TRAP staining, respectively.
In transwell co-culture, combination MSDK enhanced osteoblast differentiation and mineralization to the greatest extent vs. Os-/V. Layered co-culture study demonstrated similar patterns of osteoblast induction. Interestingly, osteoblast induction occurred at a greater extent in all Os+ treated culture vs Os-/V, suggesting that cell-to-cell contact was important for modulating osteoblast differentiation. In both cases, M and S alone showed a significant increase in osteoblast mineralization suggesting the possible contribution of these two agents in bone formation by MSDK treatment. Parallel assessment of the treatment’s effect on osteoclast differentiation showed that combination MSDK inhibited osteoclast differentiation to the greatest extent vs Os-/V cells even though exposure to M, S or K alone also inhibited osteoclast differentiation. Measurement of the ratio of RANKL: an osteoclast inducer and OPG: a RANKL decoy receptor in transwell co-culture further revealed the potential underlying root of MSDK’s effect, which involved induction of membrane bound OPG: RANKL ratio by MSDK treatment as a result of both increasing membrane bound OPG level and decreasing membrane bound RANKL level.

History Of Organs In Pittsburgh

Brendan Lowery
Sacred Music | Mary Pappert School of Music
Faculty Advisor: Ann Labounsky, Ph.D.
Poster

I plan to explore the history of pipe organs in the Pittsburgh Region. I will show research pertaining to the similarities of these organs, what influences went into the building of them, and what builders developed the organs.
30 Analysis of Changes in Water Quality of the Allegheny River, Pennsylvania and its tributaries
Emily Mashuda, Beth Dakin and Brady Porter, Ph.D.
Center for Environmental Research and Education | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Brady Porter, Ph.D.
Poster
The Allegheny River supplies water to over one million people in the Pittsburgh area, and yet its use is threatened by our economic and industrial activities. As a part of 3 Rivers QUEST (Quality Useful Environmental Study Teams), a comprehensive water quality monitoring and reporting program, samples were collected biweekly from January 2013 to July 2015 from 14 sites on the Lower Allegheny River and its tributaries. Water temperature, pH, and specific conductance were taken with a multiparameter probe. Grab samples were collected to measure total dissolved solids, alkalinity, several anions (Bromide, Chloride, Sulfate), and several dissolved metals (Magnesium, Calcium, Sodium, Manganese, Aluminum, Iron, Strontium) and were analyzed by a certified lab. Chemical parameters and ratios serve as indicators for specific types of pollution including abandoned mine drainage (AMD), road salt runoff, and produced water from hydraulic fracturing for natural gas extraction. Several of these parameters have established levels for safe drinking water quality.

This study focuses on the Kiskiminetas River (Kiski) and its impacts on the Allegheny River Mainstem. The Kiski is a major tributary for the Allegheny River, resulting from the convergence of the Conemaugh River and Loyalhanna Creek. Historic data was obtained from the EPA and PADEP at comparable sites from 1950 to 1986. Historical levels of sulfate at the Kiski-Vandergrift site ranged from 50 to 500 mg/l (average 249.92mg/l), with some points greatly exceeding this range. By comparison, current levels observed from 2013-2015 generally ranged from 50 to 200 mg/l (average 118.184mg/l). Levels of dissolved aluminum at the Kiski-Vandergrift site historically ranged from 0.8 to 15.0 mg/l (average 4.85mg/l), drastically higher than the current range from 0.02 to 0.12 mg/l (average 0.056mg/l). Sulfate and aluminum are both associated with AMD, a legacy issue in the Pittsburgh area, and current values reflect lessening effects of this industrial activity.

31 Long-distance transmission of Parkinson’s pathology from olfactory structures deep into the central nervous system
Daniel Mason, Negin Nouraei, Jimin Han, Deepti B Pant, Kristin M Miner, Amanda M Gleixner and Rehana K Leak
Pharmacology | Mylan School of Pharmacy
Faculty Advisor: Rehana Leak, Ph.D.
Poster
Parkinson’s patients typically exhibit disruptive non-motor symptoms such as an early loss of smell. The pathological hallmark of this condition is the appearance of Lewy bodies filled with the aggregated lpha-synuclein protein. Recent studies suggest that synuclein inclusions develop in olfactory structures in the early stages of Parkinson’s disease before their appearance in regions associated with motor deficits. Recent studies suggest that synuclein inclusions spread from the posterior brainstem into more anterior
structures but that the olfactory pathology is not heavily transmitted to deeper brain structures. However, we hypothesized that synuclein pathology might spread from olfactory structures into areas important for learning and memory, such as the hippocampus and entorhinal cortex, which are known to share anatomical connections with the olfactory bulb (OB). We hypothesized this because the entorhinal cortex and hippocampus are known to develop Lewy pathology at the end stages of Parkinson’s disease, when most patients experience cognitive decline. To test this hypothesis, we injected pre-formed synuclein fibrils into the mouse OB and anterior olfactory nucleus (AON), two areas situated immediately above the nasal cavities. As expected, we discovered that synuclein inclusions are able to spread from the original infusion site to the entorhinal cortex and hippocampus, in addition to many other sites known to harbor anatomical connections with the OB/AON. The inclusions in the olfactory structures were labeled with stains specific for amyloid formations and for aggregated synuclein, providing evidence of their Lewy-like nature. Our results are consistent with the view that synuclein pathology can be transmitted from cell to cell and that olfactory pathology is responsible for at least some spread of Lewy pathology into structures essential for learning and memory. In conclusion, we have established a novel model of olfactory pathology with implications for non-motor Parkinson’s symptoms such as loss of smell and cognitive dysfunction.

32 Investigation of the role played by the RNA G-quadruplex structure in ALS/FTD pathology
Damian McAninch, Rita Mihaiulescu and Mihaela Rita
Chemistry and Biochemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Rita Mihailcescu, Ph.D.
Poster

Amyotrophic lateral sclerosis (ALS) is a fatal neurodegenerative disorder resulting in motor neuron loss in brain and spinal cord. Frontotemporal dementia (FTD) is one of the most common forms of young onset dementia and second most common form of dementia overall, after Alzheimer’s, resulting in degeneration of temporal lobes along with personality changes and language impairment. ALS and FTD are now recognized as members of a broad continuum of neurodegenerative disorders, linked by similar pathology, mechanisms, and overlapping clinical symptoms. Two RNA-binding proteins of interest that link the two diseases are TAR DNA-binding protein 43 (TDP-43) and the fused in sarcoma/translocated in liposarcoma protein (FUS), which are the major protein components in over 90% of ALS and over 50% of FTD inclusions. We hypothesize that the G-quadruplex RNA structure might play an essential role in the pathogenic mechanisms of FUS in ALS and FTD. In this study, the G-quadruplex RNA binding properties of the wild type and C-terminal NLS mutant FUS protein implicated in ALS/FTD will be analyzed.
33 An Examination of Factors Affecting Hemoglobin A1c Levels and Self-Care Behaviors among Type 2 Diabetic Patients in Primary Care Settings

Courtney Proie
Nursing | School of Nursing
Faculty Advisor: Melanie Turk, Ph.D. RN
Poster

The incidence of Type 2 diabetes is increasing at an alarming rate with an estimated 48.3 million people projected to be affected by Type 2 diabetes by 2050. In the U.S., the overall cost of treatment for patients with type 2 diabetes is currently $174 billion. Current data shows that diabetes has been found to be poorly controlled throughout the United States, and the CCM has been shown to be a beneficial framework for providing care to patients with Type 2 diabetes. This study will examine the effects of the components of the Chronic Care Model on the outcomes of self-care behaviors and HbA1c levels for type 2 diabetes patients in the primary care setting. The results of this study can offer information to improve outcomes and provide a comprehensive assessment of current Type 2 diabetes patients to see where future research efforts need to be focused.

This cross-sectional, descriptive study will examine 8 areas of the CCM related to the management of Type 2 diabetes for patients seen by nurse practitioners and physicians in the primary care setting. A packet of six questionnaires will be given to the participant for their completion. A hemoglobin A1c result will also be obtained from the patient’s chart. The SPSS software package version 20.0 will be used to analyze the data using multiple linear regression and ANCOVA analyses.

Currently, there are no studies that have evaluated patient participation levels in decision making and decision support when different practitioners see newly diagnosed type II diabetic patients, nor have there been any quantitative studies evaluating patient participation scores and their relationship to overall management outcomes. Understanding the relationships among participation, decision support, practitioners, and outcomes can be vital in the future management of newly diagnosed type II diabetic patients.

34 The Rhetoric of Exploitation in International Clinical Research: An Ethical Consideration

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Both

Exploitation embeds party A taking advantage of B such that A benefits exclusively. Mutually advantageous contexts however involve both parties drawing some benefits, though those of one part may outweigh the other. This paper rejects this standard rendering. It examines the moral undertones of the rhetoric of exploitation in international clinical research. Employing a cost benefit analysis, it argues that if the net gains of A dwarf B’s, such a sphere of interaction is not ethically mutually advantageous. While international research in developing economies may provide access to medical care and offer other community benefits such as basic health infrastructures; these benefits are
generally short-term in nature, and hardly foster long-term mechanisms to improve individual and collective societal lot. That the summation of benefits in host communities are usually meager compared to the long-term gains of BigPharma and future patients in sponsoring countries further underscores the inadequacy of the rhetoric of mutually beneficial advantages. Against this conceptual backdrop, this paper argues for a fairer approach to sharing the benefits of international research. In this vein, it notes that exigent to a fairer moral calculation is a consideration of the local moral logic as it encounters the global, and a broader consideration of the congeries of interests and intentions of all involved parties.

35 The Spiritual Aesthetic in Solomon Northup's 12 Years a Slave
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Faculty Advisor: Kathy Glass, Ph.D.
Poster

From Solomon Northup’s entrepreneurial position as a violinist in his Saratoga community, to the slaves’ “patting” songs he describes on Epps’s plantation, to the transcription of “Roaring River: A Refrain of the Red River Plantation” at the end of the text, music permeates his narrative 12 Years a Slave. Steve McQueen’s 2013 film adaptation strategically engages music and sound to more fully represent the realities of slave life. In both the text and film, music becomes the means by which the system of slavery and those who uphold violent oppression come under critique.

The spiritual, an essential musical form to black culture and life, is a powerful mode for slaves to articulate sorrow and resistance with coded language and symbols without being punished. McQueen’s film adaptation includes a pivotal scene where Northup, played by Chiwetel Ojiofor, sings the spiritual “Roll, Jordan, Roll” with the community to mourn the burial of a fellow slave. In this moment, word, music, and the moving image of Northup and the community reveals strong emotionality that directly counters what Erin Dwyer refers to as “affective norms” that sought to control the articulation of sorrow within the chattel system (18). Based on these cultural readings of the spiritual, my paper will analyze scenes in Northup’s narrative where he finds solace in his despair through religion and read them in conversation with the structural contours of the spiritual “Roll, Jordan, Roll” through an intermedial prism. Bringing word, music, and the moving image together illuminates the call-and-response structure of the spiritual that engenders community and, in turn, shapes Northup’s narrative and subjectivity. Northup’s physical and visceral responses to and participation in performing music and singing reveal a nuanced emotionality that resists the “affective norms” to which slaves were held by their masters.
36 Extracellular Recording of Bladder Pain Neurons in the Amygdala

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Poster

The central nucleus of the amygdala (CeA) is known to respond to nociceptive (i.e. noxious) stimuli, making it a potential target for treatment of chronic pain conditions. One such condition, Interstitial cystitis/bladder pain syndrome (IC/BPS), is one of the most common chronic visceral pain conditions affecting 1-2% of Americans, primarily women. IC/BPS causes pelvic pain, increased frequency of urination, nocturia, and, in more than 1/3 of patients, depression. Recently, data suggest lateralized CeA responses to pain including the potential for having functional differences between left and right CeA in the modulation of pain. It is unknown whether similar asymmetry exists for the processing of bladder pain. This study focuses on recording in vivo neuron activation/inhibition of the amygdala in mice using an IC/BPS pain model in order to gain insight into the central mechanisms of bladder pain.

37 Marine Cyanobacterial Secondary Metabolites and their G-Protein Coupled Receptor Binding Abilities

Corinne Staub
Medicinal Chemistry | Mylan School of Pharmacy
Faculty Advisor: Kevin Tidgewell, Ph.D.
Poster

Marine cyanobacteria produce a chemically diverse group of secondary metabolites. These secondary metabolites can be used as pharmacological treatments, including anticancer, antiviral, and antibacterial compounds. This project examines marine cyanobacterial metabolites for G-protein coupled receptor (GPCR) binding. We are specifically interested in compounds with activity at receptors which are linked to central nervous system disorders, such as addiction, pain, and depression. The peripheral benzodiazepine receptor (PBR), renamed as the translocator protein (TSPO), is a receptor found both in the central and peripheral nervous system, with higher levels in the CNS. The receptor is located in the outer mitochondrial membrane, and is linked to inflammation and pain perception due to its expression in leukocytes.1 The TSPO possesses anxiolytic, anticonvulsant, and hypnotic properties, determined by benzodiazepine binding studies.2 Marine cyanobacteria collected from Panama and Curacao are extracted and fractionated following standard protocol. The samples are sent to the National Institute of Mental Health’s Psychoactive Drug Screening Program located at the University of North Carolina Chapel Hill. It has been determined that a number of fractions bind to the TSPO with inhibitory values ranging from 78-92% at 4 mg/mL. The goal of this project is to isolate the active compounds and determine their structure using NMR and LC-MS. Collection and protocol procedures, as well as initial research findings, will be discussed.
38 Unconventional Shale Gas Development in Washington County, Pennsylvania
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Faculty Advisor: John Stolz, Ph.D.
Poster
The recent expansion of unconventional shale gas development (USGD) has brought much debate on the potential benefits and environmental impacts. This study examined ten years of data on gas production in Washington County, Pennsylvania; one of the most productive counties in the commonwealth. It has been argued that the economic benefits and gas well lifetimes have been exaggerated. Public data obtained from the Pennsylvania Department of Environmental Protection (DEP) show gas production peaking within the first three years of well production, with many of the first wells drilled in the county already plugged. This study also addresses the significant amount of natural resources required to support the industry and how the use of these resources may negatively impact the overall environmental health of the region. To address the issue of groundwater contamination, both ground (e.g., water wells) and surface water samples were collected from sources throughout Washington County. Chemical analyses were used to establish a water quality baseline for the county and each sample was compared to the Environmental Protection Agency’s (EPA) Maximum Contaminant Levels (MCL) for drinking water standards. A number of homeowners who use groundwater as their drinking water source have seen a deterioration of water quality since USGD began – 38% of survey respondents reported a change in water quality or quantity, including two households who had lost their well during drilling activities. Sixty-seven samples (80%) exceeded the MCL of at least one drinking water standard and 49% of the samples analyzed for light hydrocarbons contained methane.

39 Exploring the communication needs of ICU patients that are mechanically ventilated and spontaneously awakened from sedation: a mini-study
Heather Vitko
Graduate Nursing, Ph.D. | School of Nursing
Faculty Advisor: Richard Zoucha, Ph.D.
Poster
Background and significance: Inability to speak due to the presence of an endotracheal tube is a major source of stress, anxiety, fear, and anger. Current evidence suggests better outcomes are achieved when a patient is minimally sedated while receiving mechanical ventilation, but this often results in patients being more awake. Patients that are intubated and mechanically ventilation are unable to speak which can lead to anxiety and psycho-emotional distress, resulting in an inability to communicate. There is a gap in the literature that specifically examines the attitudes and lived experiences of patients that are emergently intubated and later awakened from sedation. Patients that are emergently intubated and awakened from sedation may experience added psycho-emotional distress and not be aware of the circumstances surrounding intubation.
Method: A hermeneutic phenomenological mini-study was conducted to explore the lived experiences of patients who are spontaneously awakened while receiving mechanical ventilation. Interviews were conducted with patients that were recently extubated from the ventilator. All were intubated without prior knowledge that they would be unable to speak.

Data was analyzed using a method inspired by Ricouer and developed by Lindseth and Norberg which involved naïve reading, structural analysis, and comprehensive understanding between two readers. NVivo10 software was used to manage the data.

Findings: When subjects were awakened from sedation, they did not understand why they could not speak, and experienced anger and frustration due to being unable to communicate with the nurse. Themes: Panic and Dreaming. Sub-themes included unawareness of what was happening, fear, non-recollection of certain events, and not understanding why they could not speak.

Discussion and conclusions: The findings of this study provided insight into communication difficulties between patients and their caregivers. Nurses and healthcare providers must be aware of communication needs of mechanically ventilated patients to promote appropriate and holistic care.

40 Proposal to Advance Sexual Assault Program at Genesis Hospital
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DNP | School of Nursing
Faculty Advisor: Betsy Guimond, Ph.D.
Poster

With each shift, Emergency Department (ED) nurses struggle to incorporate evidence collection, forensic documentation, and forensic photography into their already busy case load. That is where the forensic trained nurse benefits the services provided by the ED.

The purpose of this project is to expand the role of Genesis Hospital Forensic Nurse Examiners beyond the role of the SANE (sexual assault nurse examiner) to provide comprehensive care for victims of violent crimes not previously served. Forensic nursing is far more than another component of emergency room care. It encompasses:

• Providing care to the victims of violence.
• Collecting and documenting evidence.
• Conducting health services for the perpetrators of crime, whether they are suspects in custody, inmates in a correctional setting or offenders placed into custodial care due to incapacitating illness.
• Treating men, women and children who have been assaulted.
• Evaluating and caring for injuries resulting from violence.
• Providing treatment to help prevent sexually transmitted infections that may result from sexual assault.
• Initiating crisis intervention when needed.
• Providing emotional support.
• Arranging medical and psychological follow-up
• Testifying in court.

These duties require a constant need for adaptation and learning. Nurses must go beyond the limits of traditional treatment and fill the much larger role of displaying forensic expertise in the field of healthcare. This project includes ongoing education of Forensic Nurse Examiners and evaluation of program effectiveness, to be supervised by this author.

41 Constructing Neighborhood Identity: Culture and Community in Pittsburgh’s Hill District
Megan Patterson
English | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Laura Engel, Ph.D.
Poster

My research paper examines the dual narratives of neighborhood identity that defined Pittsburgh’s Hill District during the formative years between 1910 and 1950. The neighborhood’s identity was forged through the rapid population, demographic and cultural change that took place during this period. As a result of massive population shifts, the neighborhood developed into an ethnic enclave defined by both its substandard, decaying infrastructure and vibrant social and cultural scene. In my research I explore the ways in which the features of infrastructural decay and cultural prosperity are utilized by various groups to create competing visions of the neighborhood’s identity. Governmental documents written by entities outside of the community define the area as a blighted space of vice and decay. For example, a 1933 report conducted by the Pittsburgh Housing Association deemed the Hill District "Pittsburgh’s greatest liability". It states, "Here is the greatest center of crime and immorality. Here, then, is an area that is ripe and rotten ripe for reconstruction". In contrast, the works of community artists and journalists depict a vision of cultural vibrancy emanating from the site of urban decay. Cultural institutions such as jazz nightspots and the unifying voice of the Pittsburgh Courier newspaper enabled the neighborhood to establish and project a cohesive local and national identity. The positive images and stories circulated by these texts challenged the imposed narrative of disorder and decay.

I conclude my paper by arguing that discussions of the Hill District’s future frequently become inextricable linked with the idea of the neighborhood’s cultural past. The vision of the Hill District presented by community redevelopment organizations is a synthesis of the dual identity developed between 1910 and 1950. Organizers construct a narrative of neighborhood identity that both acknowledges the challenges of infrastructural instability and posits a future of continued cultural vibrancy.
Predicting Novel Dopamine D3 Receptor Antagonists using Fragment-Based Drug Design

Kendy Pellegrene and Jefrny D. Madura, Ph.D.
Pharmacology | Mylan School of Pharmacy
Faculty Advisor: Christopher Surratt, Ph.D.
Poster

The majority of pharmacotherapeutics used to treat depression yield only partial relief; thus, new medications are necessary to modulate the appropriate signal transduction pathways. Dopamine-mediated brain mesolimbic pathway signaling is related to depressive symptoms, and provides a possible target for future drug therapies. This work in progress will predict dopamine D3 receptor (D3R) antagonists using fragment-based drug design (FBDD). A D3R computational model was first created in MOE using as template the x-ray coordinates of the D3R cocrystallized with the orthosteric antagonist eticlopride (PDB ID: 3PBL). The orthosteric pocket was used to screen ZINC Version 12 library; docking of fragments was performed in MOE. Protein-ligand interaction fingerprints isolated a pool of fragments interacting with the TM 3 Asp110 carboxylate side chain of the pocket. Research as indicated that interaction with this residue is important for monoamine ligand binding. Over 300,000 poses were generated for 64,000 fragments; protein-ligand fingerprints for a third of the poses facilitated sorting of compounds. The MedChem Transformations module of MOE was employed to build selected fragments within the binding pocket. MedChem Transformations were performed on one selected fragment, generating 817 potentially synthesizable compounds. FBDD should facilitate the identification of novel scaffold hit-to-lead compounds with pharmacological profiles that increase therapeutic potential while minimizing the notorious adverse effects of antidepressants. Funding: NIH/NSF grant R01DA027806

Effect of exercise dosing on pain in healthy human subjects

Anna Polaski
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Poster

Chronic pain is a serious problem in the U.S. affecting 116 million adults. Chronic pain presents itself as both an isolated condition, as well as a comorbidity for other health related conditions, such as cancer and obesity. Although numerous pharmacological interventions exist, few have proven to be effective. Exercise has been proven as an effective treatment in reducing chronic pain. However, the appropriate dose of exercise has yet to be established. The purpose of this study is to determine the minimal dose of exercise required to reduce acute pain in healthy human participants with the goal of translating these results to clinical populations. After screening, healthy participants were randomized into 1 of 3 groups: control (no exercise), low dose exercise (3x/wk), and moderate dose exercise (5x/wk). Over a 7-day period, participants performed 30 minutes of moderate intensity walking on a treadmill during assigned exercise days. Sensitivity thresholds to painful thermal stimulation and painful pressure stimulation were examined. Participants also rated the intensity and unpleasantness of both thermal and pressure pain. Currently, 14 subjects have completed the study and descriptive data have been calculated for 3 subjects per group. Trends are noted in the moderate dose group, with decreases in sensitivity to heat
and pressure intensity. The moderate dose group had the greatest reduction in pain sensitivity. This suggests that our lowest dose of exercise is not enough to reduce pain. Overall, the results of this study will have important implications for prescribing exercise to patients.

44 Asymmetrical involvement of the left and right central amygdala in bladder pain
Katelyn Sadler, Allison Trouten and Benedict Kolber, Ph.D.
Biological Sciences | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Benedict Kolber, Ph.D.
Poster

Hemispheric lateralization is a widely recognized theme in neuroscience. First made popular by identification of brain regions like Broca’s and Wernicke’s areas, asymmetrical involvement of the two hemispheres is now attributed to many different neural processes outside of language cognition. Lateralization is observed in many species from the most basic invertebrates to humans. Recently this phenomenon has been reported in the central amygdala (CeA) during pain processing in rodents. As members of the limbic system, the left and right CeA are well positioned to integrate both affective and sensory information that is generated during chronic pain conditions like interstitial cystitis/bladder pain syndrome (IC/BPS). Our lab has previously demonstrated the importance of the right CeA in bladder pain processing using genetic, pharmacological, and optogenetic techniques, however the involvement of the left CeA in these processes is unknown. In this report, we use optogenetics to activate both the left and right CeA in the context of bladder distension to determine each nucleus’s contribution to this specific type of visceral pain. Increases in bladder pain-like responses are observed only during activation of the right CeA; activation of the left CeA has no effect on pain-like responses. Immunohistochemical analysis demonstrates equal cellular activation levels and basal neuron densities between the two nuclei, suggesting that another mechanism must be responsible for the observed physiological asymmetries.

45 Trauma and Learning: Trauma-informed teaching in the schools
Sareska Tamayo and Cassandra Berbary
Special Education, Counseling and School Psychology | School of Education
Faculty Advisor: Tammy Hughes, Ph.D.
Poster

American children are exposed to violence at a shockingly high rate. When taking into account 50 different victimization categories, 57.7% of youth had some exposure to violence, 15.1% had been exposed to six categories, and 4.9% to ten or more categories. Exposure to trauma has a significant negative impact on child learning where children are left in a state of hyperarousal that strongly influence their perceptions and decision making to events other children would find nonthreatening. Consumed by fear and survival responses, children find it difficult to achieve a state of calmness that would allow them to process verbal instructions and learn in class. In addition to learning problems, children can experience feelings of anxiety and depression in addition to acting aggressively.

Schools can address the negative academic, behavioral, and psychological impact of trauma their students’ experience by adopting a trauma-informed approach. To mitigate the effects of trauma,
faculty and school staff need to understand the impact of trauma on the developing brain, increase their skill at recognizing the signs of trauma symptoms and develop policies, procedures, and setting practices, to actively resist re-traumatization. School practices, guided by trauma-informed care principles, empowers teachers and staff to create supportive learning environments and teach traumatized children to modulate their emotions and gain social and academic competence. Traumatized children have difficulty recognizing emotions so they react impulsively. By helping children identify and articulate their emotions, these children can, in turn, learn to regulate their reactions. Trauma-sensitive schools recognize the need for the child to calm down before guided to identify his/her feelings. Also, because these children come from an environment where power is exercised arbitrarily, discipline methods should avoid coercion and battles for control. The importance of adopting a trauma-informed care in schools, and information regarding trauma-informed care implementation will be discussed.

46 Analysis of a unique, conserved gene system regulating development-associated gene expression for Streptomyces coelicolor
Joseph Sallmen and Joseph McCormick, Ph.D.
Biological Sciences | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Joseph McCormick, Ph.D.
Poster

Streptomyces coelicolor is a Gram positive, soil dwelling bacterium that exhibits a complex life cycle, which includes the germination of a single spore into a vegetative mycelium ultimately culminating in the synchronous division of aerial hyphae into unigenomic spores. Early genetic studies identified two classes of genes that resulted in developmental blocks, bald and white. The bald (bld) phenotype occurs when colonies cannot produce aerial hyphae and thus appear to have a smooth, lustrous appearance. White (whi) colonies exhibit incomplete sporulation or loss of production of the concurrently produced grey pigment. While some of the original mutants have been explored, the functions of many of the identified genes are not well understood. Of particular interest is a tripartite system of genes, with multiple homologues of each gene present in S. coelicolor chromosome and in other streptomycetes. These three genes encode a predicted helix-turn-helix protein (WhiJ-like proteins), a small, acidic protein of unknown function (BldB-like proteins), and an anti-sigma factor. In order to explore the roles of these genes in development, one such system involved in the regulation of spore-associated protein (sap) expression was analyzed. sapR and sapS are whiJ and bldB-like genes, respectfully, and sasA, a sap anti-sigma factor, are one such tripartite system that may regulate the expression of the sapCED spore-associated protein operon. In order to investigate the potential roles of this gene system, single and double null mutants were isolated using recombineering. Spore-associated proteins were extracted using a nonlethal detergent wash and analyzed on a Coomasie Blue stained SDS-PAGE. Analysis shows an increase in the production of spore-associated proteins in both single mutants and double mutants of sapR and sapS while no such increase was observed in the sasA null mutant, suggesting a role for SapR and SapS in developmentally-associated gene regulation. This was further confirmed by genetic complementation of the sapR and sapS mutants.
47 "The Cost of that Cursed Horse:" Campaign Creatures and Forbes' Expedition
Sarah Weaver
History | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Alima Bucciantini, Ph.D.
Poster

This research paper examines the diverse roles animals played in the Forbes’ expedition of 1758. Despite transforming the natural and human environment around them in powerful ways, such animals have often been overlooked by historians. Horses, cattle, sheep, oxen and other creatures were fundamentally vital to military ventures of this time, as essential sources of food, transport, and power. This British expedition was the fourth attempt to control the strategically and economically viable Ohio River Valley in the French and Indian War (or Seven Years’ War 1754-1763), by capturing Fort Duquesne from the French (situated at the forks of the Ohio River). It was directed by Brigadier General John Forbes and Colonel Henry Bouquet. When building a road across western Pennsylvania to reach their objective, these men faced numerous logistical challenges – the lack of accessible transportation routes, harsh weather, intractably dense forests and high, stony mountains – all encumbered the soldiers’ advance and added to the expedition’s cost. Animals, as extensions of this natural world, also were agents of change. When applied to the historical record, the unique synthesis of military, environmental, and archaeological theories and methods clearly delineates their decisive position within this expedition. As a food source, campaign creatures diverted a substantial portion of time and resources from the expedition’s efficient progress; as a means of transporting not only men, supplies, and military material, but also information and their own food, they engendered conflict between humans which manifested itself in other areas of military importance; their role as targets and weapons also aided (and hindered) the expedition. These functions affirm animals’ fundamental significance in human affairs.

48 Construction of a Serotonin Transporter Homology Model from a Eukaryotic Template
Michael Wasko, Christopher Durratt, Ph.D. and Jeffry Madura, Ph.D.
Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Christopher Surratt, Ph.D.
Poster

The serotonin transporter (SERT), which promotes reuptake of serotonin from the neuronal synapse, is a key target of current antidepressant drugs including the serotonin-selective reuptake inhibitors (SSRIs). The lack of a SERT crystal structure requires the use of a homology model for in silico studies. Until recently, a crystal structure of the distantly homologous bacterial leucine transporter (LeuT) served as the SERT computational template. Recent advances have yielded crystal structures for closer SERT homologs, and thus are candidates to replace LeuT as a structural template. This work details the construction of a human SERT homology model based on the 2013 Drosophila (fruit fly) dopamine transporter structure. The Molecular Operating Environment (MOE) was used to align the amino acid sequences and models were constructed using both MOE and MODELLER. The DOPE scoring function, incorporated in MODELLER, was used to rank the constructed models. The new hSERT model will provide a more accurate ligand binding pocket, which should allow for structure-based methods.
including fragment-based drug design through fragment screening. It is hoped that the model will afford
design of novel-scaffold pharmacotherapies for depression and other serotonin-based CNS disorders.

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49 Investigation of Water Quality in Proximity to Unconventional Gas Extraction Within and
Around Cross Creek County Park, PA
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Center for Environmental Research and Education | Bayer School of Natural and Environmental Sciences
Faculty Advisor: John Stolz, Ph.D.
Poster

The combination of horizontal drilling and high volume hydraulic fracturing for unconventional gas
extraction has been used extensively in Pennsylvania since 2005. The use of such technology for
extracting Marcellus shale gas poses potential risks to surface water and groundwater. The purpose of
this study was to assess surface water quality within Cross Creek County Park, Washington County,
Pennsylvania and groundwater quality in the surrounding area through residential well water sampling.
Currently, seven wellpads containing 25 total unconventional wells are located within the park. A YSI
Multi-meter was used to determine water characteristics on site, such as temperature, pressure, DO%,
DO (mg/L), pH, conductivity, specific conductivity (μS/cm), and total dissolved solids (mg/L). Water
samples were acquired for anion analysis (ion chromatography), cation analysis (ICP-MS, University of
Pittsburgh), and dissolved gas analysis (gas chromatography, VaporTech Services, Inc.). All water
samples were filtered (0.45 μm) before anion and cation analysis. In addition to water analysis, other
environmental aspects were evaluated that included mapping drilling, mining, and land use with ArcGIS
software. Data on natural gas production, solid and liquid waste generation, water use, and drilling
violations were evaluated as reported by the PA DEP and PA DCNR. Since water sampling began in May,
2015, there have been a number of environmental events within the park that include fish kills, algae
blooms, and elevated Fe and Mn concentrations. A trend between some anion (e.g. bromide, fluoride,
chloride, and nitrate) levels was detected with respect to lower summer precipitation. Methane was
detected in surface waters, and while this could be from natural sources, the additional detection of
ethane and propane could be attributed to unconventional drilling.

50 Efficiency of Placements for Webpage Commercials
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Journalism and Multimedia Arts | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: William Gibbs, Ph.D.
Poster

The fast growth of Internet makes human beings nowadays obtain information via screens instead of
pages. Advertisements, likewise, appear on web pages more frequently rather than paper mass media.
Clicking those commercials on a web page is the most common method to lead the traffic of users to
their own website. While the placement of advertisements on a web page becomes vital because it
heavily determines whether a commercial would catch the attention of users. In my project, I’m going to research the placement efficiency of advertisements. I am interested in discovering if the placement of advertisements on a web page attracts users’ attention or causes users’ frustration. This is an important area of research because today commercials or advertisements pervade web pages and yet their actual effects on users vary based on the placement of the advertisement. Therefore, researching the impact of the placement of advertisements would be useful and necessary for advertisers and web developers.

This project is premised on theoretical research in visual communication, web design, and user interface design principles. In my project, I’m going to conduct several focus groups during which I will present users a series of designed web pages. The design of these web pages will be based on current, online advertising, and interface design conventions and practices. I will vary the placement of advertisements on each page and ask users to rate their level of frustration, satisfaction, or like/dislike of the web page. Its purpose is to expose me to methods for assessing interfaces, investigating usability issues and reaching the best placement for advertisements on web pages.

Keywords: advertisement, placement, efficiency, visual communication, user interface

51 An Amazon in Streatham Park: The Literary Career of Hester Lynch Thrale Piozzi

Megan Vicarel

History | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Holly Mayer, Ph.D.
Poster

Should forgotten women writers be cast as victims, or mavericks? Literary historians have treated Hester Lynch Thrale Piozzi as one or the other—I suggest she may be both.

Mrs. Piozzi (1741-1821), born Hester Lynch Salusbury, was a “woman of quality” among the upper society of London during the late eighteenth and early nineteenth centuries. She married once for convenience and once for love, was esteemed as a gracious hostess as much as a sharp wit to rival the intellectual Bluestockings, and could be both steadfast friend and determined enemy. She penned an invaluable memorial to renowned literary critic Dr. Samuel Johnson, chronicled her Grand Tour in a memorable travel journal, and was a dedicated diarist and poet. Mrs. Piozzi’s love for writing was undeniable. But her professional success—public, published, and paid—further demonstrates a savvy ability to determine when conditions were favorable enough to navigate the predominantly male domain of eighteenth-century literary publishing.

I focus on Mrs. Piozzi’s professional career as such in order to demonstrate her agency in choosing when to move from writer to author (and back). Three publications primarily comprise this career, as well as a fourth work that provides an amateur foil to the others. Yet despite these tangible professional successes during her lifetime, Mrs. Piozzi’s name—or rather, names—have been obscured almost entirely from the literary canon in ensuing centuries. Furthermore, the argument can be made that her successful publications were only viable around the fame of her male mentor, Dr. Johnson.

Without casting Mrs. Piozzi irrevocably as either a victim of repressive gender roles or as a literary genius with lifelong career ambitions, I demonstrate that her publications resulted from the confluence
of circumstance and the tactics she employed, both to take advantage of her opportunities and to overcome her obstacles.

52 Towards Structural and Functional Determination of Human $\alpha_1$ Glycine Receptor
Rathna Veeramachaneni
Chemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Michael Cascio, Ph.D.
Poster
Glycine receptors (GlyR’s) are inhibitory ligand-gated receptors in the nicotinicoid receptor superfamily. GlyR’s mediate neurotransmission in CNS and are typically activated by glycine. GlyR is implicated in pain signaling to the brain. In order to better understand the silencing electrical activity of the brain and also the structure and function of GlyR in its open state, ivermectin (IVM) sensitive GlyR channels are developed as IVM is shown to stabilize GlyR in its non-desensitizing state. Double mutant F207A/A288G in $\alpha_1$ human GlyR has been shown to increase IVM sensitivity and reduce/remove sensitivity for glycine. We are developing photo crosslinking methodologies linked with mass spectrometric analysis on systematically generated single Cys mutations in GlyR with both Cysnull and IVM sensitive backgrounds to enable us to study state-dependent structure of GlyR in a desensitizing and a non-desensitizing manner. Distance constraints obtained from the above studies for the different states of GlyR can be used to update the computational models of GlyR and can help perform comparative studies between the different states of GlyR.

53 Variation in corticosterone in male and female free-living salamanders
Jessica Thomas, Andy M. Magyan, Peter E. Freemana and Sarah K. Woodley
Biological Sciences | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Sarah Woodley, Ph.D.
Poster
Glucocorticoids (GCs) are hormones involved in metabolism that are also released in response to stressors, where they induce numerous behavioral and physiological changes to help the organism cope with the stressor. In many vertebrates, both baseline and stress-induced GCs change on a seasonal basis as well as among individuals. It is hypothesized that this variation is related to various physiological factors including immune function, reproductive investment, and both current and future energetic demands. To better understand the variability of GCs, we measured baseline and stress-induced corticosterone (CORT) in field-caught male and female Allegheny Mountain Dusky salamanders throughout the year and examined several potential predictor variables: sex, neutrophil to lymphocyte (NL) ratio, fat body mass, gonad mass, and body mass. A model that included sex, NL ratio, and their interaction as predictor variables best explained variation in baseline CORT. Specifically, NL ratio was positively correlated with baseline CORT in females but not males. This could be reflective of mating behavior in this species, in which males scratch and release pheromones onto the backs of females. This behavior could make females more susceptible to infection during times of mating, in which case activating the immune system would be beneficial. Differing from baseline CORT, a model that included sex, relative body mass, and their interaction best explained the variation in stress-induced plasma
CORT. Specifically, stress-induced plasma CORT was higher in animals with relatively greater body mass, and males had overall higher levels than females. This suggests a link between current energetic maintenance and the magnitude of the GC response to stress. Overall, this study highlights individual variability of GCs and suggests a relationship between plasma GCs, immune investment, and current energetic demands.

54 Technology in the Hands of Students: Using Technology in a Student-Operated Manner to Support Students with Autism
Stephanie Shelpman and Gulnoza Yakubova, Ph.D.
Middle Level Education 4-8 | School of Education
Faculty Advisor: Alexandra Santau, Ph.D.
Poster

Research evidence on the effectiveness of using technology to support children with autism spectrum disorder (ASD) is increasing. Schools are continuously equipped with innovative technology and portable electronic devices, such as electronic interactive whiteboards (IWB), iPads, iPods, and others. Of these devices, IWBs have become a part of almost all classrooms and are mainly used as a large screen presentation device. Yet, IWBs support student learning when they are used in a student-directed manner rather than a traditional teacher-operated manner. This article provides tips for teachers on using IWBs in a student-directed manner to increase students' participation and learning.

55 A search for blood-induced promoters in Asaia sp. SF2.1 a midgut symbiont of the Anopheles vector
Jackie Shane, David Lampe and Lianna Paul
Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: David Lampe, Ph.D.
Poster

Asaia sp. are gram-negative rod shaped bacteria that have been shown to colonize the Anopheles mosquito midgut. Species of this mosquito are the main vector for malaria transmission throughout the world. Using a paratransgenic strategy in which transgenically modified symbiotic organisms affect their host’s phenotype, Asaia has been engineered to secrete anti-malarial effector molecules so that they will be released from the cell into the mosquito midgut, hindering its ability to carry Plasmodium. However, the constitutive overexpression of these effectors causes a fitness disadvantage to the Asaia strains that carry them. Therefore, it is desirable to express these molecules only when Plasmodium is present in the mosquito midgut, namely when a mosquito takes an infected blood-meal. To identify conditional promoters, three techniques are being pursued using the plasmid pGLR1 which has a promoterless dual reporter system with GFP and lux. These include a promoter-trap library, integration of promoters from homologous genes, as well as promoters discovered through RNA-Seq differential gene expression analysis. These promoters were cloned into the plasmid, which were then transformed into the lab strain Asaia sp. SF2.1 and plated on iron or heme enriched media. GFP fluorescent colonies were collected and screening is being performed to isolate the promoters that are only induced when iron or heme are present in the media. Furthermore, in-vivo analysis inside mosquitoes is ongoing. This
process involves feeding mosquitoes on the transformed bacteria through a sugar meal. The mosquitoes are then separated for blood feeding and both blood-fed and sugar-fed mosquitoes are dissected and the conditional fluorescence of their midguts is evaluated.

**56 Genetic analyses of ftsK and ftsK-like genes for development-associated chromosome segregation in Streptomyces coelicolor**  
Sumedha Sethi  
Biological Sciences | Bayer School of Natural and Environmental Sciences  
Faculty Advisor: Joseph McCormick, Ph.D.  
Poster

Streptomyces coelicolor is a gram-positive soil bacterium with a complex life cycle, which has been used to study development for many decades. During morphological differentiation of S. coelicolor, aerial hyphae synchronously divide into chains of unicellular compartments metamorphosing into spores. This synchronous division involves faithful simultaneous segregation of the replicated linear genome into newly formed prespores. Among other segregation and divisome proteins, the DNA translocase FtsK directs chromosome segregation by forming a hexameric ring structure around the DNA at the septa. In addition to ftsK, there are two other potential ftsK-like genes that have not yet been examined for redundancy of function during development-associated segregation in S. coelicolor. The purpose of this study was to construct ftsK-like mutant strains using a PCR-directed mutagenesis (recombineering) approach for genetic and phenotypic analyses using DNA staining and fluorescent gene fusions with EGFP to analyze genome segregation and protein localization patterns. Mutants for one gene have been isolated and are currently being characterized. Once verified, double deletion mutant strains for ΔftsK ΔftsK-like deletion will be constructed. Another part of this project was to investigate whether segregation proteins interact with FtsK by employing a bacterial two-hybrid (BACTH) system. To explore potential interaction partners of FtsK, the 3’ end of the ftsK encoding the cytoplasmic motor domain of FtsK was cloned into BACTH vectors and was analyzed for interactions. Preliminary observations indicate interaction of FtsK with itself corresponding to the multimerization of its structure and weak interaction with two other segregation proteins ParA and ParJ. Analyses of the roles of FtsK and FtsK-like proteins can further elucidate the complexities of chromosome segregation in this filamentous and sporulating bacterium.

**57 A molecular analysis of the mating system of the fantail darter (Etheostoma flabellare) in Bates Fork, Greene Co., PA**  
Ashley Seitz and Beth Dakin  
Environmental Science and Management | Bayer School of Natural and Environmental Sciences  
Faculty Advisor: Brady Porter, Ph.D.  
Poster

In this study, microsatellites were used to gain information concerning the mating system of a population sample of the fantail darter (Etheostoma flabellare). The fantail darter has an interesting reproductive strategy; the guarer males claim territory under a flat rock, females select a male and his territory, then flip upside down to deposit eggs on the underside of the rock. The male then fertilizes the
eggs and provides all parental care. The goal of this study was to determine an average number of females that contribute to each nest, as well as the frequency of cuckoldry or nest takeover events. In May 2013, we collected egg and adult samples from Bates Fork, Greene Co., PA. DNA was extracted from the samples and a set of three microsatellite loci were used to estimate parental relationships to embryos. The average number of eggs in each nest was 349.4, with a range of 50 – 817 eggs. The average minimum number of females that contributed to each nest was 10.4. In 80% of the nests the guarding male was providing foster care.

58 Cymatics: The Music Within the Water.
Thomas Carraher
Music Technology | Mary Pappert School of Music
Faculty Advisor: Lynn Purse
Oral Presenter and Poster

Cymatics focuses on the interaction of sound waves and vibrations with various responsive mediums (sand/powders, and most commonly water). By channeling vibrations through water incredibly complex geometric patterns begin to appear in even the tiniest spaces.

In my recent experiments I’ve used a speaker (laying on its back), covered by a metal plate to transmit vibrations from the speaker cone to a bottle cap full of water resting on top. Then using an HD camera and ring light I am able to record and project the visualizations from the water’s reaction to the vibration of the speaker. As I play specific tones through the speaker different patterns begin to take shape. Some pulsate while others dance around furiously. The geometry is intricate and beautiful and can be likened to the complexity of the stained glass of Notre Dame Cathedral. Some say the patterns remind them of snowflakes and crystalline or chemical structures. The research is expressing the power vibration has over the arrangement of matter.

Within the coming months I intend to compose music that generates visually stunning arrangements of geometric patterns and project them live in real-time along with the performance of this music. The composition project will shed light on the power of vibration as a primary vehicle of organization in the universe and how participating in music can allow for that same organizational power to take place in our physical bodies.

59 Chronic Toxicity of Crude 4-Methylcyclohexanemethanol to the Crustacean Ceriodaphnia dubia
Jacob Keeney and Rachel Wadell
CERE | Bayer School of Natural and Environmental Sciences
Faculty Advisor: John Stolz, Ph.D.
Oral Presenter and Poster

On January 9th, 2014 more than 10,000 gallons of an organic solution contaminated the Elk River in West Virginia, which serves as a water source for over 300,000 residents in the Charleston area. The main constituent of the solution was 4-Methylcyclohexane methanol (MCHM). Prior understanding of
crude MCHM’S toxicological effects on aquatic organisms has been limited. In this experiment, chronic toxicity tests were performed using the aquatic microcrustacean Ceriodaphnia dubia. Chronic reference toxicant tests using Sodium Chloride were run for quality assurance. Two tests were conducted with MCHM: a range finder test and a narrow range test. No Observed Effect Concentration (NOEC) values were 6.25 mg/L while the Effect Concentration 50% (EC50) was 25 mg/L. These results are consistent with recent studies which used a similar organism (Daphnia magna) in acute toxicity tests, but much lower than other tests performed prior to 2014.

**60 Pain Nanomedicine: COX-2 Targeted Theranostic Nanoemulsions Redesigned**
Lu Liu, Sravan K. Patel, Michele Herneisey and Jelena Janjic, Ph.D.
Pharmaceutics | Mylan School of Pharmacy
Faculty Advisor: Jelena Janjic, Ph.D.
Oral Presenter and Poster

Theranostic nanomedicine is an emerging field that personalizes medical treatment by combining imaging and drug delivery properties into one nanosystem. Macrophages play a central role in acute and chronic inflammation. These cells are highly attractive target for nanomedicine development with the aim of imaging inflammation and improved drug efficacy. (Patel and Janjic, Theranostics 2015)

Macrophages infiltrate sites of infection and injury, and produce majority of prostaglandins leading to acute and chronic pain. Our lab developed the first inflammatory pain nanomedicine approach that specifically targets COX-2 in infiltrating macrophages. (Patel et al, Clinical Immunology 2015, Patel et al PLOS One 2013, Janjic et al SPIE 2013). Here we present new pain nanomedicine formulations (theranostic nanoemulsions) with significantly increased COX-2 inhibitor drug loading. These novel designs aimed to improve their pain reducing action and improved inflammatory targeting.

Nanoemulsions were prepared by microfluidization, scalable process with high level of quality control (Liu et al, Bioresearch Open 2015). In this study we present pharmacological evaluation of the new and redesigned pain reducing theranostic nanoemulsions in inflammatory cells, quality assessment data and evidence for sustained anti-inflammatory effects in vitro related to extended release profile. These novel formulations set the stage for further expansion of nanomedicine into pain research and development of new treatment.

**61 Post Traumatic Stress Disorder and Music as Healing**
Jason Hoffmann
Musicianship | Mary Pappert School of Music
Faculty Advisor: Zvonimir Nagy, Assistant Professor
Poster

War and specifically post traumatic stress disorder have a devastating effect on soldiers. In my study I investigate the emotional underpinnings of the life of the French composer, professor, ornithologist, and soldier Olivier Messiaen (1908-1992) by looking at the scholarly work that give accounts of his actions. I look at the practices during antiquity as an analytical framework for using art as healing.
Throughout Messiaen’s compositional career he included his own transcribed versions of birdsongs in his music. Contemporary scholarship has shown how Messiaen took birdsong and created a musical universe of ornithology, but not much research has been done into understanding the possible reason as to why. Messiaen believed that birdsong, in its very essence, embodied the eternal music of God because birdsongs has remained virtually unchanged over time immemorial. The first piece to completely embrace birdsong was The Blackbird. The Blackbird used conventional form of three sections to explore unconventional tonality, influenced by serialism but not strict serialism, to create the aesthetic of birdsong in music with flute and piano.

Throughout his career birdsongs represented a positive force that sustained him as a composer. The use of birdsong at specific times during Messiaen’s career functions similarly to how the ancient Athenians used art, specifically theater, to reintegrate returning combat veterans into civil society. Although Messiaen was not diagnosed with post traumatic stress disorder, my study offers an alternative perspective on his creative process by pointing towards several of the symptoms over the course of his life. The symptoms of PTSD did not debilitate Messiaen’s ability to be a successful member of society. It is Messiaen’s archetype of using the arts as a method of healing the soul that is seen in my study as an example that could help our own veterans.

**62 An Ethical Framework for Communication of Prognosis in Pediatric Critical Care Medicine**  
Amanda Mattone  
Health Care Ethics | McAnulty College and Graduate School of Liberal Arts  
Faculty Advisor: Gerard Magill, Ph.D.  
Poster

Communication is the most widely used medical tool, yet it often comes with no protocol or guidance for its use. The lack of an ethical communication framework in pediatric medicine is especially problematic as pediatric physicians often experience difficulty having challenging conversations regarding prognosis. This presentation will discuss the need for an ethical framework for communication of prognosis in the pediatric critical care setting. This presentation will first seek to explain communication theory as it applies to pediatric medicine, next this analysis will explore how communication theory can be enlightened by related bioethics topics, and lastly the discussion will provide an ethical framework for communication of prognosis in the pediatric critical care setting.

**63 Numbers and Proportion in Performing Arts: An Exploration of Musical Space in Stravinsky’s Agon**  
Benjamin Meyer  
Guitar | Mary Pappert School of Music  
Faculty Advisor: Zvonimir Nagy, Ph.D.  
Oral Presenter and Poster

Numbers and music share a synergy in which spatial attributes can be created by the interplay of structure, compositional process, and performance. In my study, I consider the consistencies of musical structure and musical space by closely examining the spatial modality of musical language in the
twentieth century music. By closely examining the formation of musical structure, orchestration, and chorography, my analytical study thus delves into Stravinsky’s compositional process that relates twelve-tone rows to musical space by combining dance movements and numerical proportions in his work Agon: A Ballet for Twelve Dancers. Specifically looking at the unfolding of Stravinsky’s multimodal spatiality found in the selected movements of Agon, I propose an analytical framework in which I explore the reciprocity of music and space. As I examine the relationship of numbers and proportion in Stravinsky’s piece as an attribute to the compositional process, I develop a methodology by which a closer look at Stravinsky’s work reveals dissecting similarities and polarities with mathematics and proportion. In this way, new dimensions of compositional techniques are aimed to merge the divergent lines between musical space and musical structure, suggesting a unique perspective on Stravinsky’s compositional process. Based on the composer’s personal accounts and contemporary analyses of Stravinsky’s works, my study thus suggests possibilities of conceptualizing music that forms a bond with mathematics and musical structure, embodying a kaleidoscopic impression depicting a “symphony of space.”

64 Evangelicals at the Climate Change Crossroads
Steven Perry
Theology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Sebastian Madathummuriyil, Ph.D.
Oral Presenter and Poster

The results are in and the findings are less than spectacular. In recent polls on attitudes towards climate change, evangelicals are the least likely group to accept both its reality and importance. Despite this trend, some evangelicals have heeded the call to address one of the great moral crises of this generation. The Evangelical Climate Initiative, made up of various pastors, scholars, academics and executives, has committed itself to making a vital statement about climate change and the challenges facing our world today. This initiative to provide a positive evangelical Christian response has been met with opposition. The Cornwall Alliance, a group consisting of theologians, scientists, economists and other scholars, has willfully fought against the efforts of evangelicals whom they have termed “climate alarmists.” This group denies that the science of climate change is convincing and has advocated against many of the policies put forward to deal with it. The goal of my paper will be to investigate the efforts over the last decade to put forth an evangelical initiative that adequately addresses the concerns of evangelicals regarding climate change. By comparing the efforts of the Evangelical Climate Initiative and the Cornwall Alliance to argue for their positions, climate change advocates may better understand the unique concerns they face in trying to win over the evangelical population. Ultimately, it will be shown that while many evangelicals in academia and other executive level positions have committed to doing something about climate change, support from their parishioners has been less than successful, indicating the need for better communication at the grassroots level to reach their congregations.
An Ethical and Practical Analysis of the Benefits Associated with Compensated Live Organ Donation

Jordan Potter
Center for Healthcare Ethics | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Gerard Magill, Ph.D.
Oral Presenter and Poster

In a December 2007 bulletin, the World Health Organization (WHO) reported that 66,000 kidney transplants, 21,000 liver transplants, and 6,000 heart transplants occurred globally in 2005. In the United States less than a decade later, the United Network for Organ Sharing (UNOS), the national transplant organization of the United States, reports that over 123,000 Americans are currently on the United States’ organ transplant waiting list, and over 101,000 of those individuals comprise the kidney waiting list alone. In addition, nearly 16,000 Americans are waiting on a liver transplant, and thousands upon thousands more are waiting for heart, pancreas, lung, and intestine transplants. It is estimated that the organ waiting list is growing by upwards of several thousands of Americans per year.

These statistics highlight the growing crisis that is the global organ shortage. In virtually every nation around the world, the demand for viable organs for transplantation greatly exceeds the available supply. A potential remedy to this issue is to incentivize live organ donation by providing compensation for live organ donation, and in countries such as Iran, the only country in the world to currently have a legal system of compensated live kidney donation, this has been an effective model of organ donation that has ultimately eliminated their kidney waiting list since 1999. In this presentation, I analyze the numerous potential ethical and practical benefits of a national system of compensated organ donation, including but not limited to: erasing national organ waiting lists, providing financial relief to poorer populations, promoting individual autonomy, and reducing the prevalence of organ trafficking and transplant tourism.

Simultaneous Inhibition of the PI3K/Akt and MEK5/ERK5 Cascades Reduce Proliferation and Migration in Hormonally Diverse Breast Cancer Cell Lines

Thomas Wright, Christopher Raybuck, Katheryn Wendekier and Jordan Waddell
Pharmacology | Mylan School of Pharmacy
Faculty Advisor: Jane Cavanaugh, Ph.D.
Oral Presenter and Poster

Aberrations in the Phosphoinositide-3-kinase (PI3K) and Mitogen Activated Protein Kinase (MAPK) pathways have been linked to increased breast cancer proliferation and survival. It has been proposed that these survival pathways are enhanced through compensatory signaling and crosstalk mechanisms. Promising combinations of PI3K and MEK inhibition have been evaluated in phase I clinical trials for various types cancer. However, these clinical trials have had limited efficacy and have yet to encompass the MEK5/ERK5 pathway, a recently discovered MAP kinase, which has been shown to promote cell survival. The goal of our study was to elucidate the role of MEK5/ERK5 in proliferation and migration of hormonally distinct breast cancers. In addition, our study aimed to determine the synergistic effects of dual kinase inhibition. Therefore, to examine proliferation, migration, and crosstalk between these
pathways, we treated MDA-MB-231(Triple Negative), MCF-7(ER+), and BT-474(Triple Positive) breast cancer cells with U0126, LY294002, and XMD8-92, known inhibitors of the ERK1/2, PI3K, and ERK5 pathways, respectively. Our results indicate that inhibition of the ERK1/2 pathway led to an increased activation of the PI3K pathway. Interestingly, inhibition of ERK1/2 signaling was not as effective at decreasing breast cancer cell proliferation as inhibition of the PI3K and ERK5 pathways. These data suggest that crosstalk between these kinases occurs, such that inhibition of the ERK1/2 pathways increases PI3K activity. In addition, dual inhibition of PI3K and ERK5 effectively reduced both proliferation and migration in all three cell lines whereas, inhibition of ERK1/2 alone or in combination with PI3K or ERK5 blockade, yielded mixed responses. In conclusion, a combination of PI3K/Akt and MEK5/ERK5 inhibition may prove to be a novel therapeutic approach for treating several types of breast cancer.

67 Exploring the linear water dimer potential curve using quantum monte carlo
Shiv Upadhyay and Jeffry D. Madura, Ph.D.
Chemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jeffry D. Madura, Ph.D.
Poster

The N-electrons in a system, responsible for the chemical behavior, can be quantified by the Schrödinger equation. This equation for complex systems is mathematically intractable. Widely used approaches to approximate solutions to this equation include post Hartree-Fock (HF) or Density Functional Theory (DFT) methods. However, manipulation of this equation has been shown to resemble a diffusion equation with a sink term; a problem with stochastic solutions. This approach, called Diffusion Quantum Monte Carlo, is favorable as it achieves chemical accuracy with favorable \(N^3\) scaling of computational resources with system size. Here the linear water dimer is treated at the MP2 and M06-2X levels of theory to provide comparison to quintessential techniques of HF and DFT, respectively, with the modified aug-CC-pvtz with Dirac-Fock AREP pseudopotentials. Ground state energies and geometries are reported.

68 Understanding the thermodynamic stability relationship of ribavirin polymorphs through estimation of transition temperature
Dipy Vasa, Jesse Yu and Peter L.D. Wildfong, Ph.D.
Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Peter L.D. Wildfong, Ph.D.
Oral Presenter

Polymorphism, the ability of a compound to crystallize in two or more solid forms with different conformations of the molecules in the crystal lattice, is frequently encountered in pharmaceutically relevant compounds. The thermodynamic stability relationship between two polymorphs is described as enantiotropism when the transition temperature (Ttr) is below the melting temperature (Tm) of either solid forms. Evaluation of Ttr is crucial as the order of relative stability between polymorphs reverses above and below this point; or polymorphic interconversion becomes readily accessible. Detailed characterization of the solid forms constitutes an essential part of pharmaceutical research and
development. In the present work, Ribavirin (C₈H₁₂N₄O₅; anti-viral agent) was crystallized and characterized as two unique polymorphs (R-I and R-II) using X-ray powder diffraction (XRPD) and thermal analysis. R-I (mp 168°C, ΔHf = 175.3 J/g) and R-II (mp 177°C, ΔHf = 165.6 J/g) were determined as enantiotropic systems based on the Heat of fusion rule. Using the melting data and isobaric heat capacities of both the polymorphs, the transition temperature (Ttr) was found to be 70.7. Additionally, a thermodynamic formula using the difference in heat of solution (ΔHsol) between polymorphs and solubility ratio (SR-I/SR-II) was derived to overcome the limitations associated with the former technique. The transition temperature of ribavirin polymorphs calculated by this formula was in good agreement with the earlier technique, at 69.5°C. The knowledge of this thermodynamic parameter is expected to guide the formulation scientists to adequately modify the heat-laden manufacturing processes of milling, granulation and compaction with a view to alleviate the existing problem of in situ conversion of ribavirin solid forms.

69 A Case Study: Promoting an Equitable Eating-out Food Environment through the Application of a Food Justice Frame
Alexandra Bisesi
Social and Public Policy | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Michael Irwin, Ph.D.
Oral Presenter

This case study examines the effectiveness of developing and applying a “food justice frame” as a mobilization tool to promote an equitable Eating-out Food Environment (EOFE) in an urban neighborhood of Pittsburgh. A mixed-methods approach was taken to gather material and perception data, culminating in a community action meeting to generate interventions. Findings show that a five-dimensional definition of access is appropriate and effective. The dimensions of accessibility and affordability were less important factors of eating-out behavior (EOB) than the other three dimensions. Findings also show that the methods used addressed the concerns of both food access and food sovereignty, which are the primary components of the Food Justice Movement (FJM). Additionally, an effective food justice frame was organically realized through the research process. This frame cradled the community action meeting, equalizing various forms of power, generating acceptable and desirable interventions, and empowering participants to take ownership over their EOFE.

70 Can Socially Responsible Investment Create a Preferential Option for the Poor?
Zachary Dehm
Theology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Marie Baird, Ph.D.
Oral Presenter

An important moral question yet to be considered by liberation theologians addresses the advantages and disadvantages of Socially Responsible Investment (SRIs), or the practice of only investing in companies that meet certain ethical criteria. To address this question, I first explore the ongoing debate over whether development theory or dependence theory more accurately reflect how national economies evolve. I argue that SRIs work within a particular brand of capitalism that fosters
dependency. Furthermore, I argue that SRIs indicate complacency to the negative aspects of modern capitalism. Here, I touch on the dichotomy between the good intention of SRIs and the tacitly oppressive dynamic inherent to a capitalist system. Second, I consider if the socially responsible investor’s actions and experience meet the criteria of that of conversion as outlined by Gustavo Gutierrez. I argue that they do not because they indicate an approval of the oppressive aspect of the capitalist system over a transformation in outlook and approach. Third, I conclude that SRIs constitute a failure to “act” according to the call for a preferential option for the poor. I maintain that there is precedent for liberation theologians to embrace SRIs because of their pragmatic value. However, I argue that because liberation theology calls for conversion and transformation over complacency, SRIs fall short of the call to create a preferential option for the poor.

71 From the Cross to Holy Orders: Chauvet’s Symbolic Theology and the Sacramental Implication of Women’s Presence on Mt Golgotha in Jn. 19:25-28
Besem Etchi
Theology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Marie Baird, Ph.D.
Oral Presenter

Jn. 19:25-28 notes the presence of women at the foot of the cross; actually having ascended Mt Golgotha- the New Sinai! The import of this crucifixion event may resolve the sacramental conundrum of women and Holy Orders. This paper argues that Christ’s ritual act of Jn 19:25-28 completes the dispensation for ecclesial identity through the symbolic icon of Mary’s female body. First, the paper explores the ‘from-word-to-sacrament’ journey in Marie-Chauvet’s sacramental theology along the revealed pattern: instituted by Jesus Christ for the sake of establishing the Church. Chauvet appropriates Heidegger’s critique of metaphysics to posit symbolic exchange as sacrament’s core; repudiating scholastic onto-theology in its categories of being, instrument and production. By reading Jn. 19:26-27’s double adoption formula “Woman, behold thy son...behold thy mother” via Chauvet’s symbolic exchange, I recover a ritual act enacted by Christ. Sebastian Madathummuriyil expands Chauvet’s thinking with Marion’s apophatic theology and icon-phenomenology to interpret Sacrament as gift. Madathummuriyil employs Karl Rahner’s Realsymbol of sacramental symbolic causality, holding scholasticism and phenomenology in relation. By weaving in patristic and contemporary scholarly commentary on Jn 19:25-28, using Madathummuriyil’s work, I ascertain the symbolic and iconic efficacy of Mary’s female body as Realsymbol in the Johannine event. In addition, the double consent to mutual gift of woman and disciple concludes in Jesus realizing his gift of “power to become children of God” (Jn. 1:12), establishing the Church. This paper concludes by surveying Rom 16, the Vatican’s Codex Barberini manuscript, and Mary’s priestly activity in John Paul II’s Eucharistic theology, for a liturgical history of ecclesial assent to women’s apostolic ministry. Recovering Jn. 19:25-28 as an instituted aspect of Holy Orders (Jesus’ institution of Mary’s spiritual motherhood) mirrors its counterpart, Matrimony, in a twofold call, consent and offering; and culminates a compelling Catholic systematic basis for women in Holy Orders.
72 How Abductive Reasoning Impacts Criminal Investigations
Lyndsie Ferrara and James B. Schreiber, Ph.D. (Co-Advisor)
Center for Healthcare Ethics | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Gerard Magill, Ph.D.
Oral Presenter

This research explores the six modes of abduction in relation to reasoning patterns of criminal investigators in an effort to better develop reasoning-in-practice skills for forensic science students. In contrast to deductive and inductive reasoning, abductive reasoning develops potential scenarios and then tests them against the evidence. The six modes of abductive reasoning are based on Charles Peirce’s first six classes of signs. The modes are: Hunch, Symptom, Metaphor/Analogy, Clue, Scenario, and Explanation.

Analysis of two exemplar homicide investigation cases are used in this study. The first case examines the murder of Dr. Jeffrey Farkas, a 26 year-old pediatric intern at Children’s Hospital in Pittsburgh, who was found brutally murdered in his home. The second is based on historical documentation and is known as the Dutch Case of the Ball Point Pen Murder. In 1991, a woman was found by her son lying dead on the living room floor of her house. Her right eyelid was swollen and slightly wounded. An autopsy revealed a complete ballpoint pen had penetrated her eye causing mortal brain damage.

A comparison of these cases will highlight the importance of abductive reasoning during criminal investigations and ways education can help enhance these skills. In the Dr. Farkas case the criminal investigation team focused on the evidence and began to build that evidence together from hunches, to clues, to analogies, to potential scenarios of who and why. In the ballpoint case, the investigators focused on an explanation, the end stage of abduction, of murder almost instantly. The case then fixated on finding evidence to support the explanation and not the reverse. The investigators appeared to start with induction and deduction rather than abduction. This study demonstrates the reasoning processes that occur in criminal investigations and the importance of using abductive reasoning as a primary investigative tool.

73 “Right to Try” Legislation: A Complicated Ethical Matter
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Faculty Advisor: Henk ten Have, Ph.D.
Oral Presenter

So-called “right to try” laws have witnessed a recent surge in the US. While innovative therapies for a variety of diseases are being developed and approved for market at an increasing rate, the process for getting a new therapy through the clinical trial phase progression, federal approval, and to the marketplace is drawn-out and can take as much as a decade from time of discovery. Due to this lengthy process, there has been a tradition within the area of pharmaceutical development whereby patients with advanced illness, and commonly a terminal prognosis, may be given access to novel but as yet unproven therapies. However, recently, certain advocacy groups have pursued legislative approval for
access to such experimental therapies, claiming that patients have a constitutional right to such therapies. Often dubbed either a “right to try” or “compassionate use”, these laws seek expanded access to unapproved drugs, and the system of expanded access has become increasingly controversial. Pharmaceutical developers have no legal or regulatory obligation to deliver access to unapproved therapies on the grounds of compassionate use. Nonetheless, some do, and this process raises a number of ethical challenges to be considered. The chief ethical challenge for expanded access is that patients who have exhausted all standard therapies should have a right to assuage intense suffering and to enhance self-preservation. Yet, at early stages in the development of a therapy, efficacy and safety may be uncertain. The risks of such therapy may outweigh the benefits. In this presentation, concerns surrounding early access to experimental therapies are identified and their potential consequences articulated within a bioethical framework.

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Oral Presenter

Contemporary Africa is not exempt from a global ethical meltdown evidenced in the different forms violence that saturate daily media reports. African examples as found in the South African xenophobia, the Garissa University attack, and the insurgence of Boko Haram in Northern Nigeria stare us at the face not only as instances of human’s inhumanity to fellow humans, but also as a demonstration of both a ruptured moral fiber, and a distorted ethical consciousness. Especially unnerving is the contrast between the above image and the “serenity in the pristine African traditional society” structured on a value system that centers on the preservation of life, and emphasizes a shared, reciprocal humanness with a strong sense of community and hospitality. Underscoring the importance of Africa’s ancient moral tradition, wisdom, and practice, Martin Prozesky insists that they contain “certain unique qualities that a globalizing world, beset by violence, greed, and environmental damage of a potentially catastrophic kind, badly needs to take on board.” Accordingly, the gradual loss of the African traditional ethical system in the contemporary African society is unfortunate. The paper examines the foundations of the African ethical system with focus on the community and its anamnetic thought-structure. It also considers two ways of virtue acquisition and embodiment in the traditional African society (minor genres and initiation). The paper briefly highlights some historical events (slave trade and colonization) that significantly dismantled the African value system and replaced it with a narrative laced with greed, violence, and exploitation. The paper ultimately questions the effectiveness of ecclesial categories in the formation of virtue, and argues for a twofold path to ethical reconstruction in Africa, namely: rejection and adapted revival, insisting that for the reconstruction to see the light of day, the African value system must find its way back into the mainstream of character formation.
The Effectiveness of Homework Assignments in Cognitive Behavioral Therapy for Public Speaking Anxiety: A Case Study
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Oral Presenter

The use of homework assignment in CBT has been considered as an effective intervention in clinical practice (Kazantzis, Deane, Ronan and L’Abate, 2005; Gonzalez, Schmitz and DeLaune, 2006). Many people have considered public speaking as one of the top fears they have in their lives (O’Hair, Stewart and Rubenstein, 2012). College students are not an exception. When working with college students, as counselors, helping to reduce their anxiety can be very important for their journey to reach their goals. Given the success that this researcher has had with anecdotal studies and personal experience as a practicing counselor, this study demonstrates this topic further in support of a case example. This hypothetical case study is offered as an example of how use of some specific homework assignments in cognitive behavior therapy that may be effective among college students, especially with students who have public speaking anxiety. Therefore, this study aims to demonstrate the application of homework assignment in therapy with a student on his public speaking anxiety. Based on previous research and the case study, the presenter makes specific recommendations on how to overcome the fear of public speaking for the audience.

Gender Roles and Miniature Passengers: The Implications of the Victorian Child in Limbo Between the Domestic and Public
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Faculty Advisor: Anna Gibson, Ph.D.
Oral Presenter

The examination of travel during the Victorian Era is not a new topic—the Victorian Era and the dawn of the steamship made the world more mobile and globalized than ever before. However, examinations of travel in this time period focus almost exclusively on men and occasionally on women. While numerous depictions exist, few actual examinations of the child traveler have been considered. The typical, middle or upper class child is associated most often with the domestic sphere. Illustrations of instances where these children do interact with the public sphere and travel around the globe occur frequently in non-fictional, fictional and archival accounts. This project identifies and analyzes such depictions of the Victorian child.

Many questions could develop from such a study of the child traveler, but one such area worthy of analysis is the gender roles children adopt and are encouraged to adopt when in public. The roles the children fill, both at home and when traveling, are of the utmost importance to understanding the culture at the time since the gender roles enforced in childhood mold what society expected of adults. Exploring what behaviors are expected of children, if they fulfill these roles or if they try to push back against these roles is a useful project for gender, literary and childhood studies. This paper uses
accounts of child travelers from archival newspapers, the non-fictional travel writings of Isabella Bird and Frances Trollope and J.M. Barrie’s Peter and Wendy to establish a collection of child traveler illustrations for the examination of gender role expectations and enactments in traveling children.

77 Temporally Pricing low or Spotlighting Your App? : An empirical study on Amazon Free App of the Day
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ISM | A.J. Palumbo School of Business Administration
Faculty Advisor: Wenqi Zhou, Ph.D.
Oral Presenter

This research examines the effect of visibility and pricing, and their interaction effect, on apps’ market performance. In particular, we empirically study Amazon’s Free App of the Day, which puts a single app daily in the spotlight at a zero price. Using data from Amazon, we differentiate between high visibility and temporally free pricing resulted from this promotion strategy. We test how they affect product popularity on Amazon, i.e. volume of online user-generated conversations and sales rank, which in turn affects apps’ sales and revenues on the Android app market.

78 Moving beyond the boat: Using young adult literature to scaffold teacher candidates’ understanding of the immigration experience
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Oral Presenter

With the convergence of the changing demographics in schools and the prevailing anti-immigration sentiment in the United States, teachers must play an integral role as change agents and advocates for students of immigrant families. As part of the Spiritan mission of awareness of global concerns, proper service to this population is essential in providing educational justice. This study gathered student archival data to examine how the use of adolescent literature might be used to educate preservice teachers on the immigration experience. As part of an adolescent literature course, an immigration unit asked students to read a piece of adolescent literature that told an immigration story, participate in an online book club to discuss the story, and write an immigration story of their own. Student feedback and impressions were recorded via an online survey and a small focus group. The researchers also used a qualitative, deductive coding system to label demonstrations of empathy, advocacy, cultural awareness, and assessment of course throughout course artifacts. Preliminary analysis of the data indicates that while students were initially resistant to identifying themselves as change agents and advocates, analysis of the final project and reflection indicates that the methods utilized in the course acted as avenues by which students were able to build an empathic understanding of the challenges faced by immigrant populations. Students reported via the survey that the immigration unit had a strong effect on their understanding of and ability to empathize with immigrant populations. Limitations of the current study and suggestions for further research are discussed.
Pain is an anticipated consequence of total knee arthroplasty and total hip arthroplasty. Patient satisfaction and outcomes after total joint arthroplasty may be directly affected by postoperative pain management. In order to improve these outcomes numerous techniques are used to gain effective pain control. In order to control postoperative joint replacement pain, periarticular injections are often used as one aspect of a multimodal pain control technique. A long acting bupivacaine, a type of periarticular injection, has been introduced and reported to be more effective than prior methods (Lambrechts, M. et al., 2013). The purpose of this study was to compare the use of periarticular injections using a liposomal bupivicaine as compared to plain bupivicaine in patients undergoing total joint replacement. To be included in the study, the patients had to participate in our standard multimodal pain control pathway which included: spinal anesthetic with intrathecal morphine, oral acetaminophen, cox-2 inhibitor, pregabalin and oral narcotics. Outcome measures included pain scores, physical therapy parameters, antiemetic use, elapsed time to first narcotic use, as well as total narcotic consumption measured by the daily morphine equivalent dose. Our study found that periarticular injections, whether liposomal or plain bupivacaine, resulted in decreased pain, less narcotic consumption, and earlier tolerance of physical therapy when compared to historical controls. The liposomal bupivicaine group experienced the least pain at time of physical therapy while the plain bupivicaine group consumed the least amount of narcotics. Multimodal pain management that includes periarticular injections result in improved pain control but the benefit of a long acting liposomal bupivicaine still needs to be researched more. Consequently, this study showed the cost of the long acting liposomal bupivacaine outweighed the benefits resulting in its lack of use.

Reference: