February 3, 2017

GSRS Event Program Booklet 2017

Office of Research

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Artwork by Michael Wasko, DU Graduate Student in Pharmacology.
The figure is a serotonin transporter, the primary pharmacological target of current antidepressant medication.
The 4th Annual
GRADUATE STUDENT Research Symposium
March 17, 2017
Charles J Dougherty Ballroom
Duquesne University
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledgements</td>
<td>3</td>
</tr>
<tr>
<td>Schedule</td>
<td>4</td>
</tr>
<tr>
<td>Formal Presentations</td>
<td>5</td>
</tr>
<tr>
<td>Awards</td>
<td>8</td>
</tr>
<tr>
<td>Abstracts</td>
<td>10</td>
</tr>
</tbody>
</table>
The organizers would like to thank all of the faculty mentors for their service and support of our graduate scholars.

Thank you to the Bayer School of Natural & Environmental Sciences for their donation of the corkboards.

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

- Bayer School of Natural & Environmental Sciences
- Center for African Studies
- Center for the Catholic Intellectual Tradition
- Center for Healthcare Ethics
- Center for Spiritan Studies
- Gumberg Library
- Enrollment Management Group
- McAnulty College and Graduate School of Liberal Arts
- School of Nursing
- Office of the Provost
- Office of Research, Christine Pollock & Mary McConnell-Krepps
- Phi Kappa Phi, National Honors Society
- Rangos School of Health Sciences
- Zachary Dehm, Matthew Scruggs, Gina Alberti, Kendy Pellegrene
## SCHEDULE

### 8:30 to 9:00 a.m.
- Welcome

### 9:00 to 10:00 a.m.
- **Oral Presentation Session 1**
  - Concurrent Sessions – Section A & Section B
  - **POSTER SESSION IS CLOSED AT THIS TIME**

### 10:00 to 11:00 a.m.
- **Open Poster Session** – Power Center Section C and Shepperson Suite
  - Guests are invited to walk around, peruse projects and engage with students.

### 11:00 a.m. to Noon
- **Oral Presentation Session 2**
  - Concurrent Sessions – Section A & Section B
  - **POSTER SESSION IS CLOSED AT THIS TIME**

### Noon to 1:00 p.m.
- **Open Poster Session** – Power Center Section C and Shepperson Suite
  - Guests are invited to walk around, peruse projects and engage with students.
  - Boxed Lunches provided for participants.

### 1:00 to 2:00 p.m.
- **Oral Presentation Session 3**
  - Concurrent Sessions – Section A & Section B
  - **POSTER SESSION IS CLOSED AT THIS TIME**

### 2:00 to 3:00 p.m.
- **Open Poster Session** – Power Center Section C and Shepperson Suite
  - Guests are invited to walk around, peruse projects and engage with students.

### 3:00 p.m.
- **Awards and Closing Remarks**
<table>
<thead>
<tr>
<th>Time</th>
<th>SECTION A</th>
<th>SECTION B</th>
</tr>
</thead>
</table>
| 9:00 a.m. | **Rebecca Stark**  
Physician Assistant  
Rangos School of Health Sciences  
Faculty Advisor: Kristin D’Acunto, PA-C, MPA  
Abstract: 20  
The safety and efficacy of ondansetron in the treatment of obsessive-compulsive disorder | 9:00 a.m. | **Priscila Córdoba Montoya**  
Social and Public Policy  
McAnulty College and Graduate School of Liberal Arts  
Faculty Advisor: Jenni Schulze, Ph.D.  
Abstract: 4  
Refugee-Led Organizations and the Obstacles They Face: A Comparative Study of Syria Bright Future (SBF) and the Bhutanese Community Association of Pittsburgh (BCAP) |
| 9:15 a.m. | **Alexandra Zaremba**  
History  
McAnulty College and Graduate School of Liberal Arts  
Faculty Advisor: John Mitcham, Ph.D.  
Abstract: 23  
Jasenovac Memorial Museum: The Influence of Political Ideology on State-Crafted Narratives and Croatian-Serbian Public Memory | 9:15 a.m. | **Thomas Wright**  
Pharmacology  
Mylan School of Pharmacy  
Faculty Advisor: Jane Cavanaugh, Ph.D.  
Abstract: 22  
Other Authors: Mahmud Hasan and Paula Witt-Enderby  
Dual inhibition of the PI3k/Akt/mTOR and MEK5/ERK5 pathways in tamoxifen resistant breast cancer |
| 9:30 a.m. | **Carly Potchak**  
Physician Assistant Studies  
Rangos School of Health Sciences  
Faculty Advisor: Kristin D’Acunto, MPA, PA-C  
Abstract: 97  
Contraceptive Therapy in a Patient with Tuberous Sclerosis and Schizophrenia | 9:30 a.m. | **Evangel Sarwar**  
Center for Healthcare Ethics  
McAnulty College and Graduate School of Liberal Arts  
Faculty Advisor: Henk ten Have, M.D., Ph.D.  
Abstract: 12  
Education and competency rich in genomics and ethics is a necessity for healthcare professionals in the era of genomics and personalized medicine |
| 9:45 a.m. | **Nikolija Lukich**  
Center for Healthcare Ethics  
McAnulty College and Graduate School of Liberal Arts  
Faculty Advisor: Henk ten Have, M.D., Ph.D.  
Abstract: 110  
Standards of Medicine and the Human Right to Healthcare | 9:45 a.m. | **Lindsay Davenport**  
History  
McAnulty College and Graduate School of Liberal Arts  
Faculty Advisor: John Mitcham, Ph.D.  
Abstract: 104  
Knowledge is Power: Selma Burke and Her Educational Legacy in Pittsburgh |
<table>
<thead>
<tr>
<th>Time</th>
<th>SECTION A</th>
<th>SECTION B</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 a.m.</td>
<td><strong>John Verbos</strong> &lt;br&gt; Psychology &lt;br&gt; McAnulty College and Graduate School of Liberal Arts &lt;br&gt; Faculty Advisor: Alexander Kranjec, Ph.D. &lt;br&gt; Abstract 109 &lt;br&gt; <em>Non-Symbolic Exact Quantity Representation in a Language-Impaired Population</em></td>
<td><strong>Eva Allen</strong> &lt;br&gt; Education Foundations and Leadership School of Education &lt;br&gt; Faculty Advisor: Anne Marie FitzGerald, Ph.D. &lt;br&gt; Abstract: 1 &lt;br&gt; <em>Cultural Care and Inviting Practices: Building Relationships in an Urban Elementary School. Teacher Perspectives in Forming Positive Teacher-Student Relationships Based on Care</em></td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td><strong>Eric Lambert</strong> &lt;br&gt; Pharmaceutics &lt;br&gt; Mylan School of Pharmacy &lt;br&gt; Faculty Advisor: Jelena Janjic, Ph.D. &lt;br&gt; Other Authors: Tristan Ford, Satya VVN Kothapalli, Hong Chen and Jelena M. Janjic &lt;br&gt; Abstract: 9 &lt;br&gt; <em>Novel strategy development for high intensity focused ultrasound-triggered drug release from perfluorocarbon nanoemulsions</em></td>
<td><strong>Ashley Browne</strong> &lt;br&gt; Physician Assistant &lt;br&gt; Rangos School of Health Sciences &lt;br&gt; Faculty Advisor: Brenda Swanson-Biearman, Ph.D. &lt;br&gt; Abstract: 2 &lt;br&gt; <em>A Contrast Look Between Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections (PANDAS) and the Standard Onset of Neuropsychiatric Disorders in the Pediatric Population</em></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td><strong>Clement Kanu</strong> &lt;br&gt; Theology &lt;br&gt; McAnulty College and Graduate School of Liberal Arts &lt;br&gt; Faculty Advisor: Marinus Iwuchukwu, Ph.D. &lt;br&gt; Abstract: 107 &lt;br&gt; <em>Christianity, Islam, and African Traditional Religion: A Christology of Mature Differentiation for Inter-religious Triologue in the Nigerian Context</em></td>
<td><strong>Daniel Chmill</strong> &lt;br&gt; History &lt;br&gt; McAnulty College and Graduate School of Liberal Arts &lt;br&gt; Faculty Advisor: Andrew Simpson, Ph.D. &lt;br&gt; Abstract: 3 &lt;br&gt; <em>Saving the Forest Primeval: The Creation of Pennsylvania’s Cook Forest State Park, 1910-1928</em></td>
</tr>
<tr>
<td>11:45 a.m.</td>
<td><strong>Hayley Stettner</strong> &lt;br&gt; Physician Assistant &lt;br&gt; Rangos School of Health Sciences &lt;br&gt; Faculty Advisor: Kristin D’Acunto, MPA, PA-C &lt;br&gt; Abstract: 21 &lt;br&gt; <em>The Recognition of HPV Infection as a Risk Factor for Cardiovascular Disease in Men</em></td>
<td><strong>Kevin DeBoyace</strong> &lt;br&gt; Pharmaceutics &lt;br&gt; Mylan School of Pharmacy &lt;br&gt; Faculty Advisor: Peter Wildfong, Ph.D. &lt;br&gt; Other Authors: Dr. Ira S. Buckner; Dr. Peter L.D. Wildfong &lt;br&gt; Abstract: 105 &lt;br&gt; <em>A Molecular Descriptor to Predict Dispersability of Amorphous Solid Dispersions</em></td>
</tr>
<tr>
<td>Time</td>
<td>SECTION A</td>
<td>Abstract</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1:00 p.m.</td>
<td><strong>Joseph Smith</strong>&lt;br&gt;Theology&lt;br&gt;McAnulty College and Graduate School of Liberal Arts&lt;br&gt;Faculty Advisor: Elizabeth Cochran, Ph.D.&lt;br&gt;Abstract: 108&lt;br&gt; <em>The Story of a Schism: 500 Years of Reformation and Repair</em></td>
<td></td>
</tr>
<tr>
<td>1:15 p.m.</td>
<td><strong>Linnea Manley</strong>&lt;br&gt;Center Environmental Research and Education&lt;br&gt;Bayer School of Natural and Environmental Sciences&lt;br&gt;Other Authors: Tetiana Kondratyuk, Ph.D., Daniel Bain, Ph.D., Marissa Madia, Daniel Robinson, Tyler Umstead, Colleen Nolan, John Stolz, Ph.D.&lt;br&gt;Faculty Advisor: John Stolz, Ph.D.&lt;br&gt;Abstract: 15&lt;br&gt; <em>Analysis of Well Water Quality in Southwestern Pennsylvania at the Watershed Level, 2011-2016</em></td>
<td></td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td><strong>Bethany Csomay</strong>&lt;br&gt;English&lt;br&gt;McAnulty College and Graduate School of Liberal Arts&lt;br&gt;Faculty Advisor: Laura Engel, Ph.D.&lt;br&gt;Abstract: 106&lt;br&gt; <em>“It is my mother—she beckons me to her embrace—I come”: Mother and Daughter Bodies in Mary Robinson’s Vancenza; or the dangers of credulity</em></td>
<td></td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td><strong>Dina Siniora</strong>&lt;br&gt;Center for Healthcare Ethics&lt;br&gt;McAnulty College and Graduate School of Liberal Arts&lt;br&gt;Faculty Advisor: Gerard Magill, Ph.D.&lt;br&gt;Abstract: 19&lt;br&gt; <em>Corporate Social Responsibility In The Healthcare Sector</em></td>
<td></td>
</tr>
</tbody>
</table>
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: $350
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 the Catholic Intellectual Tradition & Spiritan Studies Award for Graduate Student Research: 2 awards: $250 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.

Center for Healthcare Ethics
Award for Graduate Research in Ethics: $250
This award aims to promote the interest of students for issues in healthcare ethics within contemporary society and culture. It also intends to encourage graduate research in the area of healthcare ethics. The HCE prize is for the presentation that best highlights ethical issues in healthcare and ethical dimensions of developments in science and technology for human health and wellbeing.
Gumberg Library
Award for Graduate Research: $300
The Gumberg Library Award for Graduate Research recognizes excellence in application of research methods that demonstrate substantial use of library resources. Outstanding projects in any field of study that incorporate significant use of library expertise, resources, collections and/or services are eligible.

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.

Phi Kappa Phi, National Honors Society
Outstanding Research Award: $500
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.

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.

Rangos School of Health Sciences
Award for Graduate Research: $250
Students who are in the school of Health Sciences are eligible for this award.
**1 Cultural Care and Inviting Practices: Building Relationships in an Urban Elementary School: Teacher Perspectives in Forming Positive Teacher-Student Relationships Based on Care**

Eva Allen  
Education Foundations and Leadership | School of Education  
Faculty Advisor: Anne Marie FitzGerald, Ph.D.

The quality of teacher-student relationships impact students’ sense of belonging, motivation, behavior, engagement, and academic trajectory. This qualitative action research study investigates teacher perceptions of the impact of cultural care and invitational education (Purkey & Novak, 2016) on the formation of positive teacher-student relationships with students of color in an urban elementary school. Cultural care is defined as a gesture or gestures (verbal or non-verbal) that display a person’s genuine interest in another person’s social, emotional, mental, and physical well-being, while simultaneously recognizing and acknowledging race and culture as a significant part of a person’s identity. Cultural care must include respecting, valuing, and embracing culture from a value- and strengths-based perspective. The study examines teacher practices and perceptions utilizing the theories of invitational education, culturally relevant pedagogy (Ladson-Billings, 2014) and critical race theory (Delgado & Stephanie, 2012). Drawing on thematic analyses of semi-structured interviews, participant observations, and artifact examination, this study describes the challenges, successes, processes, and events experienced by five educators at an urban elementary school and their engagement in a professional learning community (PLC) focused on equity and care. Preliminary findings indicate the importance of teachers listening to students with intentionality; recognizing students’ basic needs as well as academic needs; acknowledging students’ presence, behavior, and growth including gestures of concern; and sharing personal stories to build relationships with students. Recommendations for practice and future research are given.

**2 A Contrast Look Between Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections (PANDAS) and the Standard Onset of Neuropsychiatric Disorders in the Pediatric Population**

Ashley Browne  
Physician Assistant | Rangos School of Health Sciences  
Faculty Advisor: Brenda Swanson-Biearman, Ph.D.

A 6-year-old white female presented to the pediatrician’s office, accompanied by her mother, with a two-week history of irritability, tic-like barking, incontinence despite being continent previously, and a chief complaint “my daughter has just not been acting like herself recently.” Prior to this encounter, the child’s past medical history was benign with the exception of multiple streptococcal pharyngitis episodes within the past year. The patient appeared anxious and uncooperative on what was an otherwise unremarkable physical exam. After a series of diagnostic testing, the child was found to have an elevated ASO titer (>400 IU), obsessive-compulsive disorder, and a transient tic. Based on the child’s
clinical presentation, she was diagnosed with psychiatric illness caused by streptococcal infection, a condition known as Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections (PANDAS). Amoxicillin 400/5 5 ml PO BID x 10 days was initiated with complete resolution. She continues to follow-up with her psychiatrist every other week. Since her diagnosis, the patient has had two relapses of symptoms, which were managed with antibiotic therapy. Little is known about PANDAS, as such, many children are not receiving adequate treatment for the causative streptococcal infection.

This case study affects the approach to psychiatric conditions as they present in the pediatric population. PANDAS is a condition diagnosed clinically, yet due to the limited understanding of the condition, many providers are either reluctant to make the diagnosis or are unaware of the condition itself. This case study is designed to illustrate how a psychiatric condition resulting from streptococcal distinguishes itself from other psychiatric conditions in hopes to make PANDAS more recognizable so that children with PANDAS receive adequate treatment for their conditions.

*3 Saving the Forest Primeval: The Creation of Pennsylvania's Cook Forest State Park, 1910-1928*

Daniel Chmill
History | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Andrew Simpson, Ph.D.

Between 1910 and 1928 a public-private partnership worked to set aside one of the oldest and best preserved old-growth hemlock and white pine forests east of the Mississippi River as state parkland. This paper examines the nineteen-year endeavor to create Pennsylvania’s Cook Forest State Park. The study provides opportunities to examine how the early American state park systems were sold to the public. Landowner and lumberman Anthony Wayne Cook believed future generations needed to experience this preserved environment. He enlisted the help of local and regional actors and organizations to best sell his privately owned land as a preserved state park to the commonwealth’s General Assembly and the public. After each defeat, activists devised new tactics and avenues of implementation. By the 1920s, prominent supporters created the Cook Forest Association. It provided a focused, specific, and determined organization to preserve the land. The Association used advertisers, newspaper articles, presentations, and word-of-mouth to generate support and public monetary contributions to make the park dream a reality in 1928. They were able to transport the preserved environment across the state and nation, allowing disparate groups, from Pittsburgh’s famous Heinz and Mellon families to ordinary girl and boy scout troops, a chance to interact with this non-human world from afar. This case study of an early Pennsylvania park argues there were important differences in regional conservation efforts when compared to the national park system. Coupled with rhetoric of protection and beauty, Cook Forest activists were salesmen as much as preservationists. Studying the creation of Cook Forest State Park tells an interdisciplinary story connecting society, tourism, citizenry, nature, and history.
*4 Refugee-Led Organizations and the Obstacles They Face: A Comparative Study of Syria Bright Future (SBF) and the Bhutanese Community Association of Pittsburgh (BCAP)
Priscila Córdoba Montoya
Social and Public Policy | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Jenni Schulze, Ph.D.

In the nexus of our collective history, it has been recorded that human induced political and social conflicts play a powerful role in displacing millions of people. The social insecurity produced by conflict persists long after they have ended, as refugees adjust to new circumstances, cope with loss, and attempt to regain a sense of normalcy. This study focuses on two distinct refugee-led organizations, namely a Syrian and a Bhutanese organization. These organizations operate in distinct stages of resettlement, in different parts of the world—one in a state of emergency, the other in resettlement in the United States. However, both organizations share a grassroots community organizing paradigm to address lingering stigma with regards to mental illness. The methods utilized in this study were based on qualitative data sources that stem from interviews with refugee-led organization directors, volunteers, and community partners. Qualitative data, in conjunction with empirical evidence from the field, serve to provide a panoramic view of how refugee-led organizations operate. The findings of this study reveal that the success of refugee-led organizations in their attempts to eliminate stigma of mental illness, by using community programming and programming evaluations as their main tools, are intricately tied to the amount of human and/or social capital refugee-led organizations hold within their community and through its members. This paper concludes by emphasizing the complementary nature of community-based programs and international humanitarian aid organizations, suggesting that the combination of both offer a more comprehensive approach to address mental health needs of refugee communities.

5 An Ethical Framework for Priority Setting within Health Care Organizations
Natalie Dick
Center for Health Care Ethics | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Gerald Magill, Ph.D.

A population’s need for health services often exceeds the availability of critical resources. When this occurs, health care organizations are compelled to set priorities in terms of which services they will provide and who they will be able to serve. The need for health care resource allocation is becoming increasingly prevalent in these settings, yet there has been a gap in commonly accepted guidelines for making these decisions. Ethical debate on issues such as rationing and medical futility have attempted to address this gap but until now have posed inadequate solutions. As a result, the need for a comprehensive, ethically grounded framework for health care resource allocation is apparent.

This presentation will provide an ethical framework for health care priority setting, with a focus on the health care organization’s role in resource allocation. First, it will explain the role of the health care organization, including responsibilities associated with organizational moral agency. Second, it will describe the ethical foundations for priority setting in health care. Third, it will explain why previous approaches – including explicit and implicit rationing – are not consistent with these ethical foundations at the organizational level. Fourth, it will outline a new, distinct priority setting framework for health care organizations, founded in both value and fairness.
The association between medication adherence in mental illness and substance use disorder relapse in patients with dual diagnosis

Tyler Dunn, Khalid M. Kamal, MPharm, Ph.D.; Vincent Giannetti, Ph.D.
Pharmaceutical, Administrative and Social Sciences | Mylan School of Pharmacy
Faculty Advisor: Jordan Covvey, PharmD, Ph.D., BCPS

INTRODUCTION: Poor medication adherence is associated with negative health outcomes, especially in patients with mental illness and substance use disorder. Currently, there is an incomplete understanding of how medication adherence for mental illness relates to substance use relapse. Further research in this area is needed to understand how interventions can target patients more effectively and improve health outcomes.

RESEARCH QUESTION: The purpose of the study is to (1) evaluate the relationship between psychotropic medication adherence and substance use disorder relapse in dually-diagnosed patients and, (2) investigate the specific role of medication adherence and barriers to use for psychotropic medications upon substance use relapse.

STUDY DESIGN: The study utilizes a mixed methodology consisting of a cross-sectional patient interview, a retrospective facility record supplementation and validation, and a prospective follow-up interview.

METHODS: Inclusion criteria included male patients at least 18 years of age who were newly admitted at a residential rehabilitation program with a self-reported diagnosis of substance abuse disorder, and either major depressive disorder, bipolar disorder, generalized anxiety disorder, or schizophrenia. Prior to admission, patients will be evaluated within their first week of treatment to assess history of substance abuse, mental illness symptom severity, and medication adherence patterns. Follow-up interviews will be conducted at 1 and 2 months post-admission to reassess mental illness symptoms and adherence. Facility records will be accessed to cross-reference patient reported data and supplement patient interview data. ANOVA and t-tests will be performed to determine the relationship between demographic, substance abuse, and mental illness characteristics according to adherence and relapses. Correlation coefficients will be utilized to analyze the relationship between adherence scores with number of relapses. SPSS Statistics (IBM Corp; Armonk, NY) will be utilized for all analyses, with a two-tailed level of significance at 0.05.

RESULTS: Work in Progress (WIP)

Three in one – multimodal (PET/19FMR/NIR) theranostic nanoemulsions for inflammation

Michele Herneisey, Marie-Caline Abadjian, Carolyn J. Anderson, Jelena M. Janjic
Pharmaceutics | Mylan School of Pharmacy
Faculty Advisor: Jelena Janjic, Ph.D.

Macrophages are involved in the progression of acute inflammation to chronic inflammation. Therefore, therapeutic treatments that target macrophages have the potential to improve patient outcome in a variety of chronic inflammatory diseases. Our lab focuses on the formulation and development of theranostic (therapeutic and diagnostic) nanoemulsions that target macrophages for the treatment of chronic inflammation. These nanoemulsions carry both therapeutic anti-inflammatory drugs and
diagnostic imaging agents that make it possible to monitor macrophage infiltration patterns in vivo, thus providing individualized feedback regarding treatment efficacy (Patel & Janjic, 2015). Our nanoemulsion platform is a triphasic system (Patel, Beaino, Anderson, & Janjic, 2015) as opposed to typical oil in water nanoemulsions. Perfluorocarbons such as perfluoropolyether (PFPE) form the fluorous core of the nanoemulsion which serves as 19F magnetic resonance imaging (MRI) agents. The fluorous core is surrounded by an oil shell that carries both anti-inflammatory drugs and near infrared (NIR) fluorescent dyes. We present further improvement of this platform through the incorporation of a third imaging agent, a positron emission tomography (PET) chelator. Addition of a PET chelator would provide increased sensitivity not achievable with NIR and MRI agents (Catana, Guimaraes, & Rosen, 2013). Here, nanoemulsions were prepared containing copper, gadolinium, and iron chelators. Chelators were anchored to the nanoemulsion through conjugation to either lipid (oil phase) or PFPE (fluorous phase). Nanoemulsions containing copper chelator were labeled with 64Cu under a variety of labeling conditions, and JMP statistical analysis software was used to develop a model that identified the variables that have the most significant impact on nanoemulsion labeling. Additionally, a preliminary complete Freund’s adjuvant (CFA) model demonstrated accumulation of a chelator-free nanoemulsion in an inflamed mouse paw. In future work, modeling will be utilized to improve nanoemulsion labeling and nanoemulsions will be imaged with PET in the CFA model.

8 Double Common Bile Duct: An Elusive Biliary Anomaly

Jennifer Gilbert
Physician Assistant studies | Rangos School of Health Sciences
Faculty Advisor: Brenda Swanson-Bierman, DNP, MPH, RN

While biliary anomalies are quite common among all populations, duplication of the common bile duct is an extremely rare condition that is seldom described in medical literature. This condition is most common in Japanese men and since the first case was reported in Japan in 1968, only 46 cases have been documented. The following case discusses a 53-year-old white male who was found to have a duplicated common bile duct following an intraoperative cholangiogram. Although this patient’s laparoscopic cholecystectomy was without complications and he made a full recovery, the everyday risks and surgical risks of having this biliary anomaly are astronomical. Everyday risks of having a duplicated common bile duct include development of pancreaticobiliary maljunction that can lead to biliary or gastric cancer. Development of gastric or biliary cancer is due to the backflow of both bile and pancreatic juices, which can irritate the mucosa and cause cell dysplasia, although the exact method of carcinogenesis is still largely unknown. Surgical risks include clipping of both the accessory and main common bile ducts, which can lead to build up of bilirubin in the liver resulting in jaundice, weakness, fatigue, and pain. Damage to any portion of the biliary tree during surgery can lead to longer hospital stays, increased readmissions, severe infections, and even death. As surgical technique begins to favor laparoscopic procedures, it may be necessary to screen at risk patients for this biliary anomaly in an attempt to avoid injuries to the biliary tree and surrounding structures.
Novel strategy development for high intensity focused ultrasound-triggered drug release from perfluorocarbon nanoemulsions
Eric Lambert, Tristan Ford, Satya VVN Kothapalli, Hong Chen and Jelena M. Janjic
Pharmaceutics | Mylan School of Pharmacy
Faculty Advisor: Jelena Janjic, Ph.D.

Stimulus-mediated drug delivery strategies are gaining popularity in an effort to increase therapeutic efficacy. These on-demand drug delivery approaches make use of light, pH, enzymes, or other stimuli to cause drug release (Rapoport 2007; Zhang et al. 2016). Magnetic resonance imaging (MRI) -guided high intensity focused ultrasound (HIFU) has been used to induce drug delivery from various types of nanoparticles (Zhang et al. 2016). Triggered drug delivery strategies are further improved by selectively targeting the diseased site. In cancer therapy, the enhanced permeability and retention (EPR) effect is known to positively influence nanoparticle uptake in tumors (Fang, Nakamura, and Maeda 2011). Perfluorocarbon (PFC) nanoemulsions (NEs) are appropriate candidates for both targeting the site of action and inducing stimulus-mediated drug delivery when combined with additional drug carrier (Astafyeva et al. 2015; Rapoport et al. 2011). We have previously shown that cancer tissue preferentially takes up PFC NEs compared to normal tissue in a mouse tumor model (Balducci et al. 2013). Hydrocarbon NEs commonly portray a higher degree of colloidal stability and are well-suited for improving cancer treatment due to the low water solubility of cancer therapeutic entities. Herein is described the formulation development of a dual-purpose NE that combines a PFC phase with hydrocarbon phase; it acts as the drug vehicle and exhibits drug release response under HIFU stimulus. Efforts to balance the colloidal stability and the HIFU sensitivity are crucial to the success of this delivery platform. Careful selection of NE excipients is conducted and statistical modeling is performed to explore what excipient attributes are critical for balancing acceptable colloidal stability with favorable drug delivery properties in the NE. It is of interest to elucidate physicochemical properties that explain the differences in colloidal behavior of hydrocarbon oil-based nanoemulsions and perfluorocarbon oil-based nanoemulsions and have an influence on HIFU sensitivity.

Treatment of bile reflux status-post loop gastrojejunostomy due to duodenal perforation
Rachel Hiltz
Physician Assistant Studies | Rangos School of Health Sciences
Faculty Advisor: Brenda Swanson-Biearman, DNP, MPH, RN

Duodenal perforation is a rare complication of endoscopic retrograde cholangiopancreatography (ERCP). These perforations often heal without intervention, but sometimes require surgical management through establishment of a loop gastrojejunostomy which may result in bile reflux gastritis. When this is refractory to medical management with proton pump inhibitors or ursodeoxycholic acid, surgical management is required. Studies have shown Roux-en-Y bypass is effective for relief of bile reflux. We present a 26-year-old white female with chronic Sphincter of Oddi dysfunction complaining of bile reflux status post loop gastrojejunostomy following duodenal perforation from ERCP. She failed attempts at medical management of the gastritis. Endoscopy confirmed presence of bile reflux gastritis, as well as, duodenal patency. Due to the contraindication of Roux-en-Y gastric bypass in patients with Sphincter of Oddi dysfunction, she is currently awaiting surgical revision, which should relieve her symptoms.
11 Hydralazine Induced Lupus Presenting with a Pleural Effusion
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An 88-year-old male with a history of end-stage renal disease (last dialyzed one day prior), coronary artery disease, hypertension, cardiac stents, and prostate cancer presented to the emergency department (ED) with increasing shortness of breath over the past 24 hours. He experienced dyspnea, moderate in severity at rest which increased in severity with exertion. He was wheezing and had a minimally productive cough, but denied a fever and chest pain. He took his BP medicine after he was dialyzed. In the ED, the patient was hypoxemic with an O2 saturation of 88% on room air. An echocardiogram done four months prior revealed an ejection fraction of 50-55%. Two months prior, he had a chronic right-sided pleural effusion and underwent thoracentesis; 1.3 L of fluid was drained. In the ED, the patient’s BP was 189/82 mmHg and pulse was 64 bpm. An EKG revealed normal sinus rhythm. An AP chest x-ray revealed re-accumulation of the right sided pleural effusion. The patient was given nitroglycerin 0.4 mg sublingually for preload reduction and a DuoNeb for wheezing which resulted in mild improvement of his symptoms. The patient was admitted and pulmonology and nephrology were consulted. Labs were positive for an anti-histone antibody and the patient was diagnosed with drug induced lupus. Hydralazine, the likely culprit, was discontinued. An ultrasound guided right thoracentesis was performed on the right lung and the post procedural AP chest x-ray revealed improvement. The patient was discharged on Day 4 with a fair prognosis. Our patient had an interesting presentation of drug induced lupus since he did not have the typical symptoms and presented with a pleural effusion. This case is a reminder that in patients with unexplained symptoms on a drug believed to have the potential to induce lupus, testing for the anti-histone antibody should be considered.

*12 Education and competency rich in genomics and ethics is a necessity for healthcare professionals in the era of genomics and personalized medicine
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Advances in genomics are contributing to the development of more effective, personalized approaches to the prevention and treatment of infectious diseases. Genetic sequencing technologies are furthering our understanding of how human and pathogen genomic factors - and their interactions - contribute to individual differences in immunologic responses to vaccines, infections and drug therapies. Such understanding will influence future policies and procedures for infectious disease management. With the potential for tailored interventions for particular individuals, populations or subpopulations, ethical, legal and social implications (ELSIs) may arise for public health and clinical practice. Understanding the ethical, legal, and social issues in the translation of genomic information into practice is essential to provide patients, families, and communities with competent, safe, effective health care. However, recent studies that compare trends in the genetic curricula have demonstrated that even though most US and Canadian medical schools have already incorporated genomics materials into their curriculum, it is not adequate to prepare physicians and other healthcare professionals to deliver confidently in the era of personalized medicine. There is a need for health provider education and competency rich in
The purpose of this paper is to look at existing educational standards, competencies, and practice resources to support the different actors in the healthcare sector, and also outline the specific needs and challenges associated with advances of genomics and personalized medicine. The paper also proposes potential solutions for educators to keep pace with this rapid advancement.

*13 Belching: What a relief! Eructation as the primary symptom of a myocardial infarction

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Belching is not a symptom one typically considers when considering a myocardial infarction (MI). Additionally, it is important to heighten vigilance to prevent potential life-threatening complications of missing an MI. This becomes even more crucial for at-risk populations such as the elderly, women, and patients with diabetes. With the case presented in this project, the patient is an elderly man with non-insulin dependent diabetes (NIDDM) who presented in the outpatient setting with minor chest pressure that was relieved with belching. On initial interpretation and based on the patient's past medical history including gastroesophageal reflux disease (GERD), the diagnosis of an MI could have been easily overlooked. Minor chest pressure that was relieved with belching can be explained through understanding the autonomic vagus nerve. Belching stimulates this nerve which decreases heart rate and releases nitric oxide which helps to provide adequate oxygenation of the myocardium. It is important to understand this mechanism to avoid missing this diagnosis in future patients that may be presenting atypically for an MI.

14 Creating Healthcare Leaders: A Neuroscientific Approach

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Numerous studies have shown that good leadership produces desirable results in the workplace. Good leaders can alleviate the stress that the workers have. They can foster environments that lessens the chances of moral distress and unethical behaviors. Thus, it would be ideal to have a method of hiring or developing people or management teams to be good leaders. There has been neuroscientific studies on the brains of different excellent leaders. The goal has been to search and find a particular variable or pattern that most great leaders share. With this variable, it will be easier to discern who has the ability to become a great leader. This would be especially useful in the healthcare industry because good leaders can have an effect on the quality of care that patients receives. The problem with this type of research is that it can prove to be unethically discriminatory. If it is found that there is a variable that all great leaders share, does that give hospitals (or other businesses) the right to deny leadership/management employment to those who do not fit the paradigm? This paper will discuss the importance of great leadership, what the current research shows on the patterns of great leaders, and the ethical implications of such research.
15 Analysis of Well Water Quality in Southwestern Pennsylvania at the Watershed Level, 2011-2016
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Pennsylvania has a long history of extractive activities, from coal to oil to natural gas. The newest of these activities is high volume hydraulic fracturing (HVHF). Though this new technique allows previously unattainable reservoirs to be tapped into, data on the consequences of this process is limited and unclear. Through a five-year study groundwater, surface water, and municipal water samples have been taken with the goal of determining the possible affects that hydraulic fracturing (fracking) has had on the water quality and quantity, of Southwestern PA. This current study reports of the analysis of those samples, within eight sub-major watersheds in the Pittsburgh area. Both EPA Maximum Contaminant Levels (MCLs) and chemical ratios were used to evaluate these samples. These samples were also compared to flowback, produced water, and brine samples collected during this study and from literature. Once potentially impacted samples were determined using chemical ratios, GIS was then used to determine which of these samples was located within 2500ft of an unconventional gas well. Over 20 such samples were identified, mostly contained in the Connoquenessing and Upper Ohio watersheds. Box and whisker plots were used to compare the range of samples taken in this study to EPA MCLs. Samples were broken into groundwater and surface plots water for each watershed. Data from this study suggests that in specific cases drinking water resources have been impacted by extractive activities. Results from this study also suggest that high quality groundwater still exists in Southwestern Pennsylvania and therefore must be protected.

16 The first example of multi linear regression (MLR) modeling applied to theranostic nanosystems design and manufacturing
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Millions of people in the US are affected by chronic pain. Every year, $650 billion are spent on medical treatments leading to heavy financial burden (Institute of Medicine 2011). Opioid analgesics have shown to be very effective in the treatment of non-cancer chronic pain management. However, they represent a risk for abuse, addiction and overdose across the globe (M. Hale 2016). As a non-steroidal anti-inflammation drug (NSAID), celecoxib is a selective cyclooxygenase-2 (COX-2) inhibitor usually prescribed for the relief of chronic pain (Derry and Moore 2012). Macrophages play a central role in chronic inflammation. Infiltrating macrophages can produce inflammation mediators, which can sensitize neurons and lead to pain (Mantyh, Clohisy et al. 2002). These macrophages emerged as highly attractive target for nanomedicine development with the aim of imaging inflammation and improved drug efficacy (Patel, Beaino et al. 2015). Our lab developed the first inflammatory pain nanomedicine approach that specifically targets COX-2 in infiltrating macrophages (Janjic, Patel et al. 2013, Patel, Zhang et al. 2013, Patel, Beaino et al. 2015). In this study, we present a novel high dose of celecoxib
theranostic nanoemulsion that are designed to treat chronic inflammation with an extended drug release profile. Current literature lacks examples of reliable prediction models for multicomponent and multifunctional nanoemulsions (theranostics) which relates critical process parameters (CPPs) such as microfluidization passes and sonication to critical quality attributes (CQAs) such as particle size distribution, polydispersity index and drug-loading. Here we present a multi linear regression (MLR) model on the relationship between CPPs and CQAs for the first time applied to theranostic nanosystems. We have employed the design of experiments (DoE) to investigate the nanoemulsion pre-formulation and formulation studies by using MLR model. The ultimate goal of this study is to develop a theranostic nanoemulsion with high drug-loading and extended release profile. Supporting evidence from in vitro data and modeling will be presented.

17 Perceived Obstacles to Implementing a Recognized American School Counselor Association Model Program (RAMP)
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The American School Counselor Association (ASCA: 2003a), seeking to provide a consistent approach to the delivery of school counseling programs, published the first edition of the ASCA National Model in 2003. Designed to promote the well-being of all students and to close the achievement gap through comprehensive programming and accountability, the ASCA National Model mirrored the overall standards-based models adopted in public education (Hatch, 2008). The ASCA National Model represents a comprehensive, developmental school counseling program that is preventative in nature. A model focusing on meeting the needs of all students through the delivery of school counseling curriculum and comprehensive services.

ASCA established the Recognized ASCA Program (RAMP) designation to reward school counseling programs who were following the Model (ASCA: 2003b) To receive the RAMP designation, professional school counselors must submit a comprehensive application documenting efforts to implement a comprehensive, data-driven program addressing their school’s specific needs. While there is emerging evidence to support the effectiveness of comprehensive school counseling programs, the movement toward executing a RAMP has been slow (Hatch & Chen-Hayes, 2008; Sink and Stroh, 2003). Oberman and Studer (2008) found that 51% of professional school counselors had not implemented a comprehensive school counseling program. Although there is evidence supporting the efficacy of the ASCA National Model, as of October 2016, less than 1,000 schools have received the RAMP designation (ASCA, 2016).

The purpose of this study is to identify what school counseling practitioners perceive to be the obstacles to achieving RAMP status, despite the fact that the professional recognizes the ASCA National Model as best practice. Potential implications of the study include identifying areas for training and supervision for school counselors and systemic interventions required to support school counselors in pursuing best practice. To date, nearly 1,700 practicing school counselors have completed the survey.
18 Dissociation with a Twist: Risk Factors, Comorbidity and Suggestibility

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Dissociative identity disorder (DID) is defined as the existence of two or more discrete personality states within an individual. This disruption is characterized by discontinuity in sense of self, in association with altered behaviors, affect, memories, perceptions, and cognitive and/or sensory-motor functions. The controversial nature of this often debilitating condition, along with the subjective nature of psychiatry, and lack of effective pharmacologic treatment strategies for subduing dissociation, make this condition a challenge in both diagnosis and management. A 52 year-old white female with a history of schizoaffective disorder (bipolar type), borderline personality disorder, and DID, presented on a voluntary admission to the psychiatric unit with complaints of increased depression and suicidality. She endorsed multiple parts of her personality, stating there were over 40 people, 4 of which, were considered major alters. The patient depicted certain personality parts as internal, whereas others, she endorsed as visual hallucinations, separate from herself. She was observed while on the unit; treatment included adjustment of her current medication regimen as well as talk-therapy via group sessions. Vital signs were within normal limits and physical exam was unremarkable. A urine drug screen was ordered in the emergency department, and was negative for drugs of abuse. Three days into her stay, the patient issued a 72-hour noticed withdrawal from treatment. She characterized her mood as significantly improved and was without suicidality on her day of discharge. This case illustrates common comorbid conditions and risk factors for disease development, while discussing a unique presentation of DID. Diagnostic and management challenges are highlighted, including the element of subjectivity in a potentially suggestible population.

*19 Corporate Social Responsibility in the Healthcare Sector

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The challenge for the health care sector, medical profession, as well as for health care business manager, is to continually explore ways to ensure that the welfares of individual patients remain the utmost primacy and simultaneously promote health care equity via corporate socially responsible activities (CSR). There is an essential need to truly embrace CSR and ethical principles that would promote equal distribution of health care resources. Relevant CSR activities would be achieved by making the most significant health problems in a given society a priority of health care organizations. CSR in health care applied to hospitals and pharmaceutical companies should promote shared values and common ethical principles in new patterns of hospital governance. In the health care context, social responsibility has a broader field of involvement including issues related to human rights, gender equality, child labor, and the environment. The health care sector is rigorously anticipated to behave ethically and deliver treatments for all individuals. As such, it is under very tight pressures from policymakers and the public at large. Health care managers, in essence, form the structure and managerial support that makes the day-to-day activities of health care attainable. They also tend to form the ethical norms for corporations. They must have a broad understanding of a number of business
values and ethical principles. They also need to acknowledge their dual role of serving the patients and communities and making a profit, as this is a significant managerial capability. The importance of CSR is now well recognized in the health care sector. CSR and organizational ethics are essential to regain vanished confidence of the local and international communities and win back the admiration of skeptical patients and doubting communities. Therefore, health care organizations have to have a renewed commitment to ethics.

*20 The safety and efficacy of ondansetron in the treatment of obsessive-compulsive disorder
Rebecca Stark
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Obsessive compulsive disorder (OCD) is a psychiatric disorder characterized by recurrent intrusive thoughts, images, or urges (obsessions) that cause significant anxiety and distress that leads to repetitive behaviors (compulsions) that an individual feels driven to perform. The symptoms of OCD can range from mild to so severe that it can be incapacitating to an individual’s life. Treatment is often prescribed including both pharmacologic and behavioral therapy. Overall, 70% of patients starting treatment experience a significant improvement, however there is still a portion of patients with severe OCD that do not respond to first and second line treatment plans. We present a case of a 62-year-old-male who was admitted to inpatient psychiatry for severe OCD. The patient failed first and second line treatment options and was prescribed ondansetron for his obsessive thoughts. Ondansetron is a 5-HT3 receptor antagonist indicated for the prevention of nausea and vomiting. Our patient successfully responded to an off-label use of ondansetron for obsessive thoughts in OCD.

*21 The Recognition of HPV Infection as a Risk Factor for Cardiovascular Disease in Men
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Human papilloma virus (HPV) is the most common sexually transmitted infection in the United States. While most cases of HPV are self-limited and asymptomatic, oncogenic strains such as 16 and 18, are well-documented causes of cervical, penile, vulvar, anal, and oropharyngeal cancer. Historically, there has been an emphasis on protecting women against HPV through increased vaccination efforts because of the strong link to cervical cancer, but there has been a huge gap in preventative efforts amongst men, who commonly suffer from HPV as well. A study has recently been conducted to observe the incidence of cardiovascular (CV) events, such as stroke and myocardial infarction (MI), among women with HPV-16 and 18 infection compared to women without HPV infection. The study suggested that HPV infection increases the incidence of cardiovascular events.

HPV, notoriously strain 16 and 18, contains protein E6 that binds to p53 protein and cause degeneration though a complex ubiquitin pathway. This p53 protein is important because it is a tumor suppressor gene that aids in regulating atherosclerosis, the process of the build up of fats and cholesterol in the wall of arteries. Atherosclerosis is the leading cause of CV events. Many studies in vivo and in humans have
shown that absence of p53 protein leads to an increase in atherosclerosis in the body. We present a case of a 55-year old male who was found to have HPV-16 positive tonsillar cancer that suffered from an MI. He had few cardiovascular risk factors at the time of the MI, and despite continued therapy on statins, his LDL and HDL levels are suboptimal. This case study adds to supporting literature that HPV may be a compounding factor to one’s CV risk.

*22 Dual inhibition of the PI3k/Akt/mTOR and MEK5/ERK5 pathways in tamoxifen resistant breast cancer

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Approximately 70% of breast cancers are considered estrogen receptor alpha (ER) and/or progesterone receptor (PR) positive, and their growth is primarily driven by the hormone estrogen. Initially these cancers are responsive to endocrine therapies such as tamoxifen. However, over time patients become resistant to conventional endocrine therapy and treatment becomes more difficult. Tamoxifen resistance occurs due to several mechanisms: loss of ER expression, gain of function mutations, pharmacological tolerance, alterations of co-activators, and ligand independent activation of ER by various kinase cascades. 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 characteristics are enhanced through compensatory signaling and crosstalk mechanisms. The crosstalk between PI3K/Akt and MEK1/2/ERK1/2 has been characterized in several systems. However, new evidence suggests that MEK5/ERK5, a member of the MAPK family, is a key component in the proliferation and survival of therapy resistant cancers. MEK5/ERK5 has been shown to promote ER alpha driven transcription in ER+ breast cancers and actin reorganization and metastasis in ER- breast cancers. Our lab has previously investigated these pathways in hormone independent breast cancers, TNBC (triple negative breast cancer). Our previous results indicate that combinations of PI3k/Akt and MEKS/ERK5 blockade are promising because they inhibit both the pro-proliferative and pro-metastatic pathways in TNBC. Based on these initial results we hypothesize that PI3k/Akt and MEK5/ERK5 inhibition decreases viability via a hormone independent mechanism: perhaps by reducing the cytosolic sequestration of Bad. In this study we investigate the utility PI3k/Akt and MEK5/ERK5 inhibition in a MCF-7 TamR cell line. The goal of our study is to elucidate the roles of PI3k/Akt/mTOR and MEK5/ERK5 in endocrine resistant breast cancer and broaden the scope of a dual inhibition strategy.

*23 Jasenovac Memorial Museum: The Influence of Political Ideology on State-Crafted Narratives and Croatian-Serbian Public Memory

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The violent warfare that took place in the Balkans during the 1990s appeared to many Westerners as an abrupt and unique event, but this region of the world is all too familiar with ethnic conflict and carries a significant memory of it. One example of this is Croatian state activity during World War II. In 1941,
Hitler created the ‘Independent State of Croatia (NDH),’ a Nazi puppet state. The NDH was governed by the Ustase, a fascist ultra-nationalist organization who held a distinct ideology which villainized Serbs whom they claimed were responsible for Croatia’s regression. The Ustase were the only Nazi collaborationist regime to operate death camps specifically aimed at liquidating a group other than Jews. One site where these executions took place was Jasenovac concentration camp.

This paper will examine the ways in which Jasenovac Memorial Site has represented the narrative of the concentration camp through its museum’s permanent exhibition. The museum was initially established under a communist government in 1968, altered prior to the Croatian War of Independence in 1988, and changed again in 2006 when Croatia was under consideration for EU membership. I will therefore argue that the permanent exhibitions of Jasenovac Memorial Museum were, and continue to be, reflections of the social movements and political ideologies present in post-World War II Croatian society. I will further argue that the state-crafted memory of Jasenovac influenced Croatian and Serbian public memory and has had an inflammatory effect on ongoing ethnic tensions in the region. In doing so, I hope to provide greater insight into the long history of ethnic conflict experienced in the South-Western Balkans, and demonstrate that the violence that took place in the 1990s was not a moment of radical ethnic hatred, but is rather related to the memory of past traumas.

### 24 Alternatives Measures to Prevent Aortic Dissection in Marfan Syndrome

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A 53 year old white male with Marfan syndrome initially presented to the ED with non-bloody diarrhea, lower extremity weakness, difficulty ambulating, and fever x5 days. He also initially presented with an INR >10 and electrolyte imbalances. His initial chest X-ray showed no acute process and CT abdomen/pelvis was consistent with enteritis with mild colitis. Once the Coumadin coagulopathy and electrolyte imbalances were resolved, blood cultures were obtained, revealing coagulase-negative S. Simulans, requiring the initiation of IV vancomycin. The bacteremia was suspected to be due to the enteritis or more likely skin contamination from stepping on a shard of glass in the junkyard 2-3 weeks prior to admission. He was admitted to the hospital due to an elevated troponin, history of a prosthetic aortic valve replacement in 2007, and risk of endocarditis from the bacteremia. Upon evaluation, the cardiologist’s plan included a TEE to rule out any vegetation on his AVR. Throughout his two day stay in the hospital, the patient denied chest pain, SOB, mucous production, nausea, vomiting, melena, hematochezia or recent weight loss/gain. On day 2 of his hospital admission and before his TEE was performed, the patient suffered from 4 cardiac arrests and life support was withdrawn.

This case illustrates the rapid and unpredictable course that an aortic dissection may have in patients with Marfan syndrome. It also demonstrates the importance of monitoring patients with Marfan syndrome to prevent unfortunate premature deaths such as this case from occurring.
25 The Effect of Fingerprint Processing and Swab Type on DNA Recovery
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Certain forensic cases have items of evidence that require processing from multiple laboratory sections. Most often these items require fingerprint processing and DNA collection. Given differences in protocols across sections and laboratories, uncertainty exists regarding the order of processing. This is a two-fold study that determined the effect of fingerprint processing prior to DNA collection as well as the impact the collection swab had on DNA recovery.

This research examined the effect of cyanoacrylate fuming and dye staining on the DNA recovery from three different substrates: glass, plastic, and metal. Blood was used as the DNA material due to its consistent quantities compared to touch DNA samples. Preliminary results of the study showed a decrease in DNA quantity with the use of fingerprint processing. No fingerprint processing yielded the highest quantity and superglue fuming with dye staining yielded the lowest. These results were as hypothesized; however, it is not standard procedure in a forensic lab to process blood with cyanoacrylate fuming. Therefore, the fingerprint enhancement technique was revised to Acid Yellow 7.

The updated research design for the study was comprised of two trials where blood was deposited on the three substrates. The first trial acted as the control where no fingerprint processing was performed. In the second trial, samples were processed with Acid Yellow 7. Within each trial, half of the DNA samples were collected using Puritan™ swabs while the other half were collected using 4N6FLOQSwabs™. It was hypothesized that after processing the samples with Acid Yellow 7, the quantity of DNA would decrease, but that using 4N6FLOQSwabs™ would recover a higher DNA quantity compared to Puritan™ swabs.

26 Implementation of Ethical Guidance on HIV Prevention Trials
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Faculty Advisor: Mrs. Glory Smith

HIV/AIDS has become a global problem since the first outbreak of the virus. Due to its aggressiveness and worldwide prevalence, curing the virus has become a global emergency. HIV clinical trials in developing countries play a crucial role in addressing this emergency. However, there exist various ethical problems regarding standards of care for research participants. Risk assessment and the protection of participants’ rights are the most important facets at stake regarding global ethics within these trials based on the UNESCO Universal Declaration on Bioethics and Human Rights. Furthermore, a double standard is present due to the vast differences that lie between standards of care of developed and developing countries. This paper examines the evolution of standards of care criteria in HIV prevention research and aims to raise awareness regarding current ethical dilemmas in HIV clinical trials. Upon addressing previous debates regarding a double standard of care in developed and developing countries, this paper subsequently examines the novel problems that accompany contemporary HIV research. Recent advances in HIV prevention methods have raised questions that have ultimately made
the design of these trials far more complicated than previous trials. This paper’s main ethical and scientific considerations are investigated by implementing four key parameters including scientific viability, participant and community welfare, trial efficiency, and trial usefulness for decision-making. Finally, in the light of the latest edition of UNAIDS’ stakeholder engagement plan, this paper concludes by arguing for an appropriate method of building consensus around the complex practical and ethical dilemmas in clinical testing of HIV prevention interventions.

27 Screening of the ScUbI yeast deletion library for modifiers of Aly1- or Aly2-mediated resistance to rapamycin in an undergraduate lab course
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Faculty Advisor: Allyson O'Donnell, Ph.D.

Cells respond to cues in their extracellular environment by selectively redistributing proteins. This reorganization is imperative for cell survival and is regulated, in part, by alpha-arrestins. How then is alpha-arrestin-mediated trafficking controlled? We know that modification by ubiquitination plays a role in modifying alpha-arrestin function. To help us identify specific alpha-arrestin regulators, we generated and utilized a unique yeast gene deletion library called the Saccharomyces cerevisiae Ubiquitin Interactome (ScUbI) library. ScUbI contains all the non-essential genes annotated as important for ubiquitination/ubiquitin interaction. We used this library as part of the BIOL 371w Cell & Molecular Biology laboratory course to screen for gene deletions that altered the growth phenotypes associated with over-expression of alpha-arrestins. Specifically, the undergraduates transformed the ScUbI library with plasmids over-expressing alpha-arrestins Aly1 and Aly2 and then assessed these transformants for gene deletions that either increased or decreased cells sensitivity rapamycin, an inhibitor of TORC1 function that mimics nitrogen starvation. Here we describe the results of these initial undergraduate screens and some of the follow up investigation on the student-chosen candidates Cos6, Atg7, and Rpn10. These results give evidence in support of previously unappreciated connections between alpha-arrestins and autophagy, proteasomal degradation, or endosomal sorting.

28 The Unexpected Diagnosis of the Insidious Insipidus
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Central diabetes insipidus (CDI) is defined as an inability to retain free water due to insufficient or no release of vasopressin (ADH). CDI typically occurs as a congenital condition or in the setting of trauma. DI presents much like diabetes mellitus (DM) with polyuria and polydipsia, as a result those with DI experience a delay in diagnosis and consequently receive postponed treatment. DI can be dangerous as the patient could sustain osmoreceptor damage causing severe dehydration. We present a case of a 49 year old white female with a significant past medical history of hypertension and obesity complaining of polyuria and polydipsia for a few months. She denied any history of trauma or congenital conditions. After the bloodwork ruled out DM, DI became the working diagnosis. CDI was pursued through testing and imaging which confirmed this diagnosis and the patient was treated with desmopressin and has resolution of symptoms.
29 DNA extraction and analysis of soft contact lenses using the Promega DNA IQ™ System
Natalie Borga
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Faculty Advisor: Lisa Ludvico, Ph.D.

With over 30 million contact lens wearers in the United States alone, there is a high potential that this type of evidence could be found at a crime scene or as part of a missing persons investigation. The epithelial cells of the eyelid and eye surface constantly shed nucleated cells, and this cellular material is in close contact with soft contact lenses. Prior studies have been able to extract and amplify DNA from lenses using a phenol/chloroform extraction or QIAmp DNA Mini Kit, but the efficiency of a less toxic process with fewer chances of contamination, such as the Promega DNA IQ™ System, has not been demonstrated. The current study aimed to investigate whether the commonly used DNA IQ™ System can extract DNA from soft contact lenses that is suitable for downstream processes such as amplification and analysis. Through this study, the forensic science field will have a better understanding of contact lenses as a source of DNA, and how to utilize this piece of evidence so as to obtain the most useful information possible. Daily replacement and monthly replacement lenses were tested and compared to see if there was a relationship between length of time worn and DNA yield. Other factors tested included fragmentation of lenses, lens rehydration with Tris-EDTA prior to extraction, and modifications to buffer composition and volume.

30 Using Genomics and Geometric Morphometrics to Explore the Adaptations of Bobcats to Diverse Ecosystems
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Faculty Advisor: Jan Janecka, Ph.D.

The bobcat (Lynx rufus) is a successful generalist predator that inhabits a broad range across North America. As generalists, they inhabit diverse range of ecological niches with their prey depending on the ecosystem they inhabit. The objective of this project is to examine bobcats from diverse ecosystems and to look for markers relating to adaptation. To generate genome-wide data, we performed double digest restriction-site associated DNA sequencing (ddRADSeq) on 148 bobcat and six Canada lynx (Lynx Canadensis) samples, generating on average half a million reads per sample. Currently, we are identifying and genotyping single nucleotide polymorphisms (SNPs) as well as exploring patterns of variation across the species. 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. In addition, geometric morphometrics will be included to better explore phenotypic adaptations. This method allows us to obtain 2D geometric points at landmarks on the skull to observe how skull shape changes between individuals to look for differences between groups. This will allow us to better explore functional differences in the shape and form of the bobcat across different landscapes. Overall, we hope to better understand the adaptations of the generalist bobcat to diverse ecosystems through genomics and geometric morphometrics. In the future, we hope to obtain additional Canada lynx samples to better understand the evolution and diversification of the Lynx genus.
31 A Case Study of Pediatric Behcet’s Disease: A Time for Change
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Faculty Advisor: Brenda Swanson-Biearman, Ph.D.

Behcet’s disease is a rare chronic and systemic inflammatory disease with associated vasculitis of both small and large vessels resulting in oral and genital ulcers, skin lesions, uveitis, arthritis, and other symptoms. It’s etiology not totally understood and there are no universal criteria for diagnosis. Because of this, pediatric patients can be misdiagnosed, preventing early treatment and prevention. We present a 17 year-old male diagnosed with Behcet’s disease. Over the previous 6 years, the patient suffered from oral and genital ulcers, acneiform lesions, hearing loss, and a hordeolum. After multiple referrals, including to a dermatologist, the patient was eventually diagnosed with Behcet’s. This case depicts the need for universal diagnostic criteria. With timely and proper recognition, patient suffering can be reduced and exacerbations shortened.

32 Exploring the experiences of families and service providers of children with autism in Zimbabwe from their own perspectives
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This study was designed to explore the socio-cultural aspects related to the experience of children with autism, their families, and their service-providers. Five parents of children with autism and two service-providers were interviewed to solicit their perspectives in terms of the process of diagnosis, family relationships, community influences, interventions, etc. Qualitative data analysis methods were used to analyze the data. Findings of the study will be presented in this poster presentation. It is anticipated that this study will help to establish a profile of children with autism in order to promote a better and clearer understanding of the disorder in Zimbabwe. We hope that this will help children with autism and their families to have better access to the services they need.

33 Monongahela City: City of Dependence
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As the age of steel or the age of coal came to an end, many cities in Southwestern Pennsylvania declined, some to the point of no return, and were forced to create a whole new economic environment to survive. Monongahela, however, does not follow this all too similar narrative making its development a unique story. From its inception, the growth of Monongahela was dependent upon its trade, such as coal, flour, granite, and lumber, and transportation, by train or by boat, with nearby cities but as other cities became more self-sufficient and globalized the city slowly began to decline as their businesses became unneeded. Unlike other cities in the area, Monongahela is not declining but it is aging. For the past few decades the city has remained rather stagnant or has begun to slowly decline as its population
is aging out. Through my research, however, I have discovered many ways that could bolster the city again based on its rich history and ambitious community.

34 Creation of medication formulary impacting Pittsburgh’s underserved population

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Background: Formularies are defined as a list of medications available to enrollees. FOCUS is a movement initiated by Orthodox Christians to serve the homeless and underprivileged populations in various cities in North America. The purpose of this project was to create a medication formulary for the underserved and uninsured presenting for care at FOCUS Pittsburgh.

Methods: Medications for various disease states were researched and their average wholesale price was assessed. Medications were tiered based upon their cost within drug class. Duquesne University Pharmacy then dispensed the medications to FOCUS utilizing the formulary.

Results: Five hundred and thirty-seven drugs were added to the formulary. The most common medications were those utilized for depression. There are currently 32 enrollees who have been entered onto the formulary. Survey of a three month dispensing history shows that 172 prescriptions have been dispensed. Of these, 113 (62%) have been Tier 1 medications, 15 (8%) have been Tier 2 medications, and 9 (26%) have been medications not on the formulary list. The most common medication dispensed that was not on the formulary was Citalopram Hydrobromide.

Discussion: The formulary at FOCUS has provided access to prescription medications to an uninsured population of Pittsburgh. In a study including diabetes patients on 1 oral diabetes medication, it was shown that providers’ access to formulary and drug cost information was associated with lower increases in yearly total drug costs averaging $208 per patient.

Conclusion: Through the use of a formulary tiering system, there will be many cost saving opportunities and room for more expensive therapies, if necessary. The formulary will be updated quarterly to mark any significant changes in prescribing or needs of the population.

References:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1403290/


In 1882, Elizabeth Cady Stanton told a friend that she was about to tell the world what they were not prepared to hear. The suffrage movement leader produced her life’s work, the Woman’s Bible (published in 1895 and 1898) which reinterpreted the parts of the bible that mentioned women and therefore reimagined the role of Christian women around the world. Publishing this commentary late in her life, Stanton hoped to use her existing influence to strike up a conversation about religion and politics, wanting to encourage women of faith to play more active roles in achieving suffrage. This poster will show that Stanton believed the Bible was a text written by men and could be reread to show that women were men’s equal. In doing this, she created a feminist interpretation on how the centuries old text was understood. The work’s title as a bible rather than a commentary of biblical texts is a power play made by Stanton at the pinnacle of her influence in order to draw attention to the idea. My methods include going through both primary and secondary sources in order to investigate the causes, responses, and influence of the Woman’s Bible. I found that while reception to the Woman’s Bible was not the success that she hoped for, it was met with harsh criticism, Elizabeth Cady Stanton succeeded in creating a work that the world was not prepared to hear and while it did not achieve suffrage for women, it strove to reconstruct views of women in biblical writings.

The incidence of simple hepatic cysts is not well known as they are typically asymptomatic and complications, including infections, are uncommon. Due to the rarity of hepatic cyst infections, potential risk factors and treatment guidelines are not well established; suggested treatment options include antibiotic therapy, percutaneous drainage, and surgical management., Urinary tract infections are one of the most common infections in the elderly and are treated with antibiotics targeting the causative etiologic agent. We present the case of an 80-year-old white female with history of uncomplicated simple hepatic cysts presenting with urinary tract infection, as well as, a cyst occupying liver segments VII and VII now enlarged with foci of gas identified on CT as the primary source of infection and symptomatology. Despite the responsible agents of both infections being Escherichia coli and Klebsiella pneumoniae different approaches to management were required for resolution.

New Castle, Pennsylvania, was the home of some of the most productive steel and tin plate factories in the United States during the twentieth-century. Dubbed “Little Pittsburgh” by journalists because of its
comparable material production to Pittsburgh, New Castle sent its products to all corners of the world. The demand for tin in the early 1930s was so large that the city rebranded itself the “Tin Capital of the World.” But as a community which focused its economy strictly around one industry, New Castle did not have a plan for what the city would do if the steel and tin industry collapsed, a process which began after World War II. The last of the city’s mills closed in 1960, ushering in a state of decline. Without jobs or opportunity, the people began a mass exodus in the 1960s as they moved elsewhere to find work.

Today, the city is still searching for a way to recover. Two factors are impeding the city’s ability to start anew. First, New Castle’s population, average annual income, and homeownership levels are still in decline and many of the city’s demographics are well below the national average in their respective categories. Second, the city’s elderly population is much higher than the population of people between the ages of 18–35. The goal of this poster is to examine New Castle’s industrial past and the demographics of the area during the twentieth-century; it will also argue that without serious intervention from the local government to both invest in new businesses and encourage younger people to move to the area, New Castle will become a ghost town by the year 2100.

38 Case report of a rare presentation of incontinentia pigmenti in a male patient
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Incontinentia pigmenti (IP) is a rare, hereditary dermatologic syndrome inherited by an X-linked dominant gene. IP affects multiple body systems, including the skin, teeth, hair, nails, eyes, and central nervous system. Four stages of IP have been noted, which vary depending on the dermatologic manifestations. The four stages can be differentiated by whether the lesions are vesicular, hyperpigmented, hypopigmented, or verrucous. Treatment options are limited, although topical steroids and urea cream may be beneficial for symptomatic relief of dermal manifestations. The typical presentation is in females, as the mutation usually tends to be fatal in male patients. However, male patients have been reported who demonstrate the minor manifestations consistent with IP, particularly the characteristic dermatologic patterns. Due to its rarity in male patients, researchers have suggested several explanations for male survival, including concomitant diagnosis of Kleinfelter syndrome or somatic mosaicism. We present a case of IP in a 15-month-old male patient who presented with dermatologic patterns consistent with IP. The patient presented with a vesicular rash and eosinophilia in the neonatal period. The rash changed after several months, and was consistent with linear, verrucous hyperkeratosis of his hands and digits bilaterally, left foot and ankle, digits of the left foot, back, and right flank. With genetic testing deferred currently, clinical diagnosis of IP was made using the established major and minor criteria. Additional workup will need to be performed for other existing genetic conditions, as well as close monitoring for additional manifestations and developmental delays. The treatment consists of urea 40% topical cream for symptomatic relief of skin manifestations.
39 Surprising Secretion Signals for Malaria Control Strategies
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Faculty Advisor: David Lampe, Ph.D.

Plasmodium sp., the parasite that causes malaria, is transmitted by the Anopheles sp. mosquito vector. The symbiotic bacteria within the mosquito midgut can be transgenically modified to affect the mosquito's phenotype, otherwise known as paratransgenesis; this strategy can be used to engineer the bacteria to secrete anti-malarial effector molecules into the mosquito midgut to combat the parasite. One such bacterial candidate is Asaia sp., a gram-negative and rod-shaped bacteria that has been shown to colonize the midgut, ovaries, and salivary glands within the Anopheles mosquito. However, common secretion signals, such as the E. coli Type II OmpA and TolB leader peptides, as well as signals from closely-related species do not function in Asaia. Also, a genetic library screen had found only one native secretion signal that provided sufficient secretion of protein into the supernatant. Therefore, the Asaia sp. SF2.1 genome was sequenced and then used to predict Type II secreted proteins, and further processed using SignalP4.1 to identify the leader signals. These signals have been cloned into the plasmid pNB92, which contains the PnptII constitutive promotor and the c-terminal domain of alkaline phosphatase lacking a secretion signal. These plasmids were transformed into the Asaia sp. SF2.1 lab strain. Positive colonies were grown overnight to log phase and separated into supernatant, lysate, and cell surface fractions. Secretion of alkaline phosphatase was tested by an ELISA assay for the abundance of protein into the different fractions. To ensure alkaline phosphatase is active when secreted, another multiwall plate assay using PNPP substrate was used. This is important because some of the anti-malarial effector molecules being used contain disulphide bonds, which are formed in the periplasm and are important for proper protein folding and function. Ongoing research is being conducted to further test these secretion signals in vitro and in vivo for sufficient secretion and Plasmodium repression.

40 Ileostomy for the Management of Small Bowel Dysmotility in Patients with Scleroderma
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Faculty Advisor: Brenda Swanson-Biearman, Ph.D.

Scleroderma is an autoimmune disorder which affects connective tissues throughout the body, often progressing to muscular unresponsiveness within the small bowel. Ileostomy is a surgical approach considered for the management of rare and refractory cases of scleroderma-associated small bowel dysmotility. The following report summarizes the case of a 46 year-old white female with history of scleroderma-associated small bowel dysmotility who presented with severe constipation for two months. Physical examination revealed a malnourished, distressed female and CT displayed dilated bowel loops. Within the next few months, the patient underwent laparoscopic-assisted ileostomy without complications. The immune-facilitated effects of scleroderma on the small bowel ultimately result in pseudo-obstruction. Medications such as laxatives, prokinetic agents, peripheral acetylcholinesterase inhibitors, and somatostatin analogues remain the mainstay of treatment. Surgical approaches may be deliberated in severe refractory cases, while novel considerations such as small
bowel neurostimulation undergo further research. Additional management considerations include nutritional status and psychological factors.

41 The Piriformis Muscle: Vestigial or Vital
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The human piriformis muscle is seemingly superfluous. It can undergo a pharmacologic forced atrophy treatment or be surgically detached or removed with few or no measurable short term functional consequences to the patient. Estimates suggest that six million new cases of piriformis syndrome are diagnosed every year. In ~10% of these cases the debilitating pain syndrome does not respond to conservative treatments such as physical therapy or pharmacology. Treatments for these difficult cases include sequential injections of Botox to atrophy the muscle, surgical tendon detachment of the muscle, or complete surgical removal of the muscle. The biomechanical nature of this deep hip muscle is an enigma due to small size (relative to neighboring muscles) and its anatomic insertion point which fuses with several other muscles. Biomechanically it appears redundant to larger muscles in its vicinity. Because of its deep/proximal anatomic location and biomechanical uncertainty, it fits the role of a postural muscle or “kinesiological monitor” as opposed to being prime mover. Little is known about the afferent nervous system innervation (spindles) or fiber type characteristics of this muscle. We hypothesized that the muscle has a high density of spindles and is primarily slow twitch, suggesting sensory and postural endurance functions. For this study the piriformis muscle was extracted from eight human cadavers, preserved in formaldehyde, embedded in paraffin wax, sectioned, and H&E or IHC (myosin) stained. Using an automated Nikon 90i microscope, images were captured for muscle spindle counts and fiber-type analysis. Interestingly the muscles showed a non-uniform spindle distribution and slow twitch (80%) fiber-type. The results of this study will have implications for health professionals, such as physicians and physical therapists, in determining appropriate interventions for patients with piriformis syndrome, hip surgery or replacement.

42 Analysis of Complex Familial Mixtures Using TrueAllele®
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Current technology has successfully simplified DNA mixture interpretation. However, factors such as the number of contributors and shared genetic material increase mixture complexity. Complex mixtures limit this new technology, especially when contributors share alleles as a result of being biologically related. This research examines the ability of the continuous probabilistic genotyping software TrueAllele® to resolve complex DNA mixtures that contain three to five related individuals. Single-source and mixture samples from three different families were analyzed in TrueAllele® and RStudio®. Results show that all true contributors are separated from the mixtures, except for one minor contributor in a five-person mixture. There were median likelihood ratio (LR) match statistics in all mixtures that fell above the study’s threshold of logLR = 6, giving evidence to persuasive statistics generated for court. In addition, all match statistics for both true and non-contributors were found to be reproducible in five of
the mixtures. Allele sharing played a large role in software interpretation, where inclusionary match statistics were erroneously generated for related non-contributors. This research provides an insight to the complexity of interpretation in situations where allele sharing is at its highest. The conclusions demonstrate that this software aids complex familial mixture interpretation; however, there are still areas to explore in order to standardize the interpretation process and decrease the number of inconclusive reports.

**43 Stiff Person Syndrome**

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Stiff Person Syndrome

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Stiff person syndrome is an extremely rare condition affecting the inhibitory pathways that control muscle relaxation. Due to its rarity, the diagnosis and management of patients with stiff person syndrome can be challenging. A 37 year old Caucasian female with a past history of glutamic acid decarboxylase positive stiff person syndrome, diabetes mellitus, seizures, and neurogenic bladder presented to the emergency department complaining of worsening muscle spasms and increased muscular tone and rigidity in her arms, legs, and back. At home she had taken baclofen and Valium with no relief of her symptoms. On physical exam, increased muscle tone was appreciated throughout the exam with significant opisthotonus noted. The patient was admitted to the medical service floor and was given intravenous immune globulin (IVIG) 40mg daily for a total of 5 days. While receiving IVIG, her white blood cell count dropped significantly and the IVIG was held and the patient was started on Neupogen. Once her neutropenia had resolved, her doses of IVIG were restarted and the patient’s condition improved. She was discharged from the hospital at baseline functioning in stable condition on Day Eleven.

This case demonstrates an example of a classical presentation of a patient who suffers from stiff person syndrome. It also shows a patient who has failed outpatient treatment of the condition. Despite the rarity of stiff person syndrome, it can be a debilitating illness. This report will examine the pathophysiology of the condition as well as possible treatment options available to improve patient outcomes.

**44 The role of Teduglutide (Gattex) in reducing total parenteral nutrition (TPN) dependence**

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Many patients diagnosed with short gut syndrome are TPN dependent. For some short gut patient populations, however, TPN is not a valid option or is otherwise contraindicated.
The following summarizes the case of a 44 year-old black female who is TPN dependent due to short gut syndrome. While she tolerates food by mouth, these nutrients are not adequately absorbed at the intestinal level. This patient also has a history of thrombophlebitis, making venous TPN access difficult. She was started on a newer GLP-2 agonist teduglutide (Gattex) to stimulate bowel growth and function in hopes to reduce or even eliminate the need for TPN and continuous venous access due to her high risk of thrombosis. Three weeks after initiation of Gattex, she had notable improvement in her stool consistency, weight gain, and successfully decreased the amount of customized TPN days necessary with no electrolyte deficiencies.

TPN dependence can present with poor quality of life symptoms such as frequent need for IV replenishment, frequent urination, severe dehydration, frequent diarrhea and eventually liver failure. Teduglutide (Gattex) is a new pharmacologic agent that acts as a glucagon-like peptide 2 agonist. The role of GLP-2 agonists is to promote intestinal surface area growth as well as the absorptive capacity of the intestine. Potential life-threatening complications of long-term vascular access include liver failure, bacteremia, septicemia, central venous thrombosis, and embolism. Jeppesen et al studied Teduglutide given versus a placebo, and the necessary volume of parenteral support was studied over various periods of time, which showed significant response in the teduglutide group. There is a strong potential for quality of life improvement in this population by decreasing the frequency of TPN as well as increasing oral intake of food, but current research and data of teduglutide in the TPN dependent population is limited.

45 Hypertension and Posterior Reversible Encephalopathy with Focal Segmental Glomerulosclerosis

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Focal segmental glomerulosclerosis (FSGS) is a histological lesion of the kidney's glomeruli. It is the most common glomerular cause of end stage renal disease (ESRD) in the United States. It results from either primary or secondary injury to the glomerulus. Primary injury is generally idiopathic while secondary causes include genetic mutations, drug toxicity or viral illnesses. This report is a case of a 22 year old African American male who presented to the emergency department (ED) with new onset of seizure activity, a blood pressure of 201/133 mmHg and a creatinine of 7.26 mg/dL. After stabilization with IV labetolol and Keppra, a CT scan of the patient's head revealed posterior reversible encephalopathy syndrome (PRES). He had a known history of genetic FSGS, but never followed up for treatment. FSGS is generally a managed through angiotensin converting enzyme inhibitors (ACE) and patient education.
46 16p11.2 Chromosomal Duplication: Emergency Department Modifications
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A 16p11.2 chromosomal duplication occurs when a patient inherits an extra copy of a portion of the small arm of chromosome 16 called p11.2. This genetic mutation has been found to occur in 3 out of 10,000 children; however, many patients go their whole lives without knowing that they have this duplication due to the wide range of genetic expression that can be seen in individuals with this abnormality. Patients with this duplication most often present on the autism spectrum and are more susceptible to mental health disorders such as schizophrenia, depression and anxiety. As a result, patients with this duplication are two times more likely to end up in the emergency department (ED) due to being on the autism spectrum. Autistic patients presenting to the ED need special accommodations including time management, behavioral distraction, and a low stress environment. With a proper exam and treatment, prognosis for these individuals is good and patients tend to respond well when not only their medical needs, but also their behavioral and social needs are taken into consideration during their visit. This is a case of a 4-year-old white male with a past medical history significant for a 16p11.2 duplication and polyhydramnios who presented to the ED with an animal bite to the face. Due to the patient’s history of a 16p11.2 duplication, extra precautions were taken in order for a thorough history and physical exam to be completed including limiting wait time, placing the patient in quiet secluded room, limiting the number of healthcare professionals in the room at once, and the use of electronics for distraction during procedures. This case will discuss further techniques that should be utilized in all emergency departments to help provide maximum care patients with an autism spectrum disorder.

47 Differentiating Takotsubo Cardiomyopathy from Acute Coronary Syndrome in an 85 year old with known atherosclerosis
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Takotsubo cardiomyopathy (TC), also known as stress cardiomyopathy or broken-heart syndrome, is a condition increasing in awareness as an important differential diagnosis for acute coronary syndrome (ACS). Classic presenting features of TC including chest pain, shortness of breath, elevated cardiac biomarkers, and electrocardiogram changes often lead to a premature diagnosis of ACS early in the course of the disease. Typically patients with this condition are found to have normal coronary arteries. The importance of considering TC as a differential even in patients with high cardiac risk factors and known atherosclerosis cannot be understated. Here we describe the case of an 85 year old white female with peripheral vascular disease and a history of unilateral carotid stenting, as well as long standing hypertension and hyperlipidemia, who presented with shortness of breath, chest heaviness, nausea, cough, and hypotension. She was diagnosed with acute coronary syndrome and taken for cardiac catheterization which revealed up to 70% non-occlusive stenosis. Regional contractile function at this time revealed severe anterolateral hypokinesis and apical akinesis consistent with TC. The patient was diagnosed with TC, started on coreg and lisinopril, and discharged on Day 4 in stable condition.
Hoarseness as Abnormal Presentation of Gastrointestinal Stromal Tumor
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Gastrointestinal stromal tumors (GIST) are the most common type of benign mesenchymal tumor of the gastrointestinal tract. GIST is usually incidentally found on diagnostic imaging while evaluating for another GI disorder. They are typically asymptomatic until much later when the tumor has grown very large and begins to cause dyspeptic symptoms, such as heartburn, regurgitation, nausea, and belching and more atypical symptoms such as dysphonia, dysphagia and globus. The manifestation of these types of symptoms usually occur when the tumor is found to be at or near the gastroesophageal junction (GEJ). It is not well known how GIST tumors cause dyspepsia and other GERD-like symptoms, but they have been linked clinically. We present a case of a 62-year-old woman who underwent esophagogastroduodenoscopy and subsequent esophageal endoscopic ultrasound for a chief complaint of hoarseness of voice (dysphonia), and was found to have a 2cm GIST tumor near the GEJ. The tumor was then completely removed shortly after by endoscopy-assisted laparoscopic surgery. The patient recovered uneventfully, without any residual symptoms.

Differences in the Early Speech Sound Development of Siblings Diagnosed with CAS or SSD
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Children whose speech-sound development does not meet expected milestones may be at-risk for a speech impairment. Although results of some studies have been helpful in identifying such at-risk children, little is known about the early speech-sound development of children with childhood apraxia of speech (CAS), a disorder affecting the motor planning of articulatory muscles resulting in slow, distorted, and effortful speech.

Children with CAS appear to develop speech differently than typically developing children (Overby & Caspari, 2015). However, investigators have not compared the early speech-sound development of children with CAS to children with a different type of speech sound disorder (SSD) such as an articulation disorder (e.g., /r/ distortion). Such a comparison would help determine if the early speech-sound development of children with CAS is different from that of other speech-impaired children. Nor have studies accounted for effects of environment on early speech-sound development.

In this investigation, we controlled for environmental influences on a child’s early (birth – age 2) speech-sound development by comparing data from participants from the same homes: two twin brothers with CAS; two sisters with SSD; and a brother and sister with CAS and SSD, respectively. We wanted to determine whether volubility (total production of speech and non-speech utterances) and number of resonant phonemes (sounds able to be transcribed using the International Phonetic Alphabet) differed between the two diagnoses. We analyzed speech and non-speech productions produced by the child from birth – age 2, as heard in home videos provided by the families. Volubility was the same for both diagnoses. The SSD/CAS sibling pair was the only pair to demonstrate statistically significant differences in numbers of transcribable utterances, transcribable consonants, consonant diversity, and number of...
consonants at 24 months. We concluded the speech-sound development of children with CAS was different than that of children with SSD.


50 Barriers to HCV Treatment for the Incarcerated Male Population
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Incarcerated individuals are disproportionately affected by hepatitis C virus (HCV) infection; inmates face unique barriers affecting treatment and outcomes. Often they refuse treatment due to the proximity of their release date, or lack knowledge to make appropriate medical and lifestyle decisions. Other barriers include interruption of care, communication, and the gap between transitioning from prison healthcare to alternative healthcare upon release. A 43-year-old male was found to be infected with HCV upon transfer to our facility. His labs showed a viral load of 953,417 IU/mL (H), genotype 1a, and an aspartate aminotransferase (AST) of 66U/L(H). The patient received no treatment for HCV due to a low aminotransferase to platelet ratio index (APRI) of 0.545 (cirrhosis suggested at 1.0) and lack of symptomatology. Fortunately, this patient did not need intervention for his HCV infection, but overcoming other barriers unique to prisoners can improve treatment and may decrease the incidence of HCV.

51 A case of benzodiazepine withdrawal misdiagnosed as Alzheimer's disease
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Between 10 to 20% of U.S. adults will experience an alcohol use disorder at some point in their lives. Almost equally common is the use of benzodiazepines which have been in practice for the past 50 years and, like alcohol, have a high abuse potential. Despite this prevalence, it seems few physicians have received adequate training focused on recognizing the symptoms of withdrawal and diagnosing substance abuse disorders. Additionally, these disorders become further masked when they occur with a mood disorder, such as depression, and it becomes easier to attribute signs of abuse to psychiatric illness. The following is a case of a 65-year-old white male with a past medical history of major depressive disorder who presented to the emergency department with a two-week history of memory and balance problems and visual hallucinations. The admitting physicians did not take a complete drug and alcohol history and so this patient’s abuse of Ambien, alcohol, and Xanax was missed and he was erroneously diagnosed first with encephalitis and later with Alzheimer’s. The patient’s drug abuse was discovered during the psychiatric team’s interview with the patient and he was successfully diagnosed with benzodiazepine withdrawal and Wernicke’s encephalopathy and treated with a Serax protocol as well as intravenous thiamine supplementation. The patient improved on this regimen and was sent home after a short course in the hospital. This case is important, therefore, in order to highlight signs
and symptoms of withdrawal in a community with ever increasing use and abuse of alcohol and benzodiazepines in patients, especially those with mood disorders. It also addresses the all too common ethical problem of medical errors linked to poor histories and serves as a reminder of how much relies on the initial history.

52 The association between physicians’ adherence to a pharmacotherapy guideline and continuity of care of patients with depression and/or anxiety disorder
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Objective: The aim of the research is to investigate the association between physicians’ adherence to the pharmacotherapy guideline and continuity of care of patients with depression and/or anxiety disorder in a collaborative program.

Methods: This retrospective observational study was conducted using medical records of subjects suffering from depression and/or anxiety disorder seen by 26 general practitioners (GP) affiliated with Community Mental Health Center (CMHC), who run a collaborative care program. All patients were visited by a general practitioner in private offices in Tehran from November 2010 to May 2013. A scoring system was utilized to assess physicians’ adherence to the pharmacotherapy guideline. The scoring method was developed and validated using expert opinion of 4 psychiatrists. The four psychiatrists gave their opinions separately and there was unanimous agreement between them. Moreover patients’ continuity of care was calculated as according to the number of days of being in CMHC program.

To investigate the association between physicians’ adherence to the guideline and the patients’ continuity of care, univariate logistic regression analysis, multiple logistic regression analysis and parametric survival analysis were used through Stata version 11.

Result: A total of 3338 patients were studied. Their mean age was 37 and 81.6% of them were women. It is indicated that being treated by a particular GP is an important factor in patients with depression and/or anxiety diagnosis as well as and also the patients with both of the diagnoses. Furthermore, higher score of adherence to the guideline is associated with less continuity of care in the depression patients.

Conclusion: Being treated by certain GPs is an effective way of retention of patients in the treatment. The results demonstrate that the patients with guideline-based pharmacotherapy need to be told about continuity of care in community mental health program.

53 Certification of a New Low-Level Hexavalent Chromium Standard Reference Material in a Soil Matrix
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Several hexavalent chromium standards in soil, certified in the past decade, either have very high
concentrations of chromium or active matrices that render them unsuitable for validating natural soil and natural background studies. NIST 2701, for example, is made of chromium processing ore residue (COPR) industrial waste material from New Jersey. It contains approximately four percent total chromium, with an unnaturally high Cr(VI) fraction (552.1 mg/kg). SRM-2701 also includes an active matrix that dominates the chemistry of the standard and causes significant Cr(III)/Cr(VI) species shift and biases during extraction. Presently, no low-background level standard containing an inert matrix is available for the appropriate validation of low level Cr(VI) in native or uncontaminated soil and low level risk assessment. An international collaboration is under way to produce a more appropriate series of low level soil certified standard reference materials for Cr(VI) analysis. Multiple laboratories in different locations are involved in a collaborative effort to certify two new reference materials at ng/g levels. These were prepared by Sigma-Aldrich in larger batches and were distributed among the participating laboratories for collaborative certification. The methods used for certification are two EPA RCRA methods: alkaline extraction by EPA method 3060A and speciated isotope dilution mass spectrometry by EPA method 6800 (Update V, 2015). The international collaboration results and the analytical methods used in the preparation of the materials and preliminary certification, including means and confidence limits, will be presented along with some discussion of the Eh and Ph phase diagram stability of the material.

54 The Days the Waters Rose: The Long Decline of Johnstown, Pennsylvania
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Faculty Advisor: John Mitcham, Ph.D.

Within the overarching rustbelt narrative, the timeline of Johnstown, Pennsylvania bears striking resemblance to the histories of cities like Pittsburgh, Detroit, and Cleveland. The rustbelt, which caressed the northern border of the United States between New York and Iowa at its peak was the epicenter of hard industry in the United States prior to the 1970s. Steel, automobiles, and iron were just three of the staple products to emerge from this region. Johnstown, a small city that lingers on the borderline of the rust belt and coal country in the Appalachian Mountains, was known for its role in Western Pennsylvania’s steel, iron, and coal production for the first half of the twentieth century. A combination of deindustrialization, demographic changes, and economic trends caused the collapse of the rustbelt in the 1970s. Some of the major cities dotting the rustbelt were able to innovate and survive the damages sustained during the 70s while reinventing themselves as hubs of cultural and technological innovation, the most notable of these Pennsylvania cities being Pittsburgh. Johnstown experienced these typical negative changes and then some; the addition of floods compounded issues of deindustrialization and stagnation on the local level. Furthermore, Johnstown did not experience the crucial revitalization felt by the city of Pittsburgh. This paper seeks answers to the following questions: what makes a dying city? If Johnstown is a dying city, what historically led the city to its demise? The purpose of this paper is to prescribe solutions that would address the chronic decline of the once-prominent steel town.
**55 Lung Transplantation for Life Transformation**  
Kristi Isaac  
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Faculty Advisor: Brenda Swanson-Biearman, DNP, MPH, RN  

Chronic obstructive pulmonary disease (COPD) is a progressive, irreversible, obstructive airway disease that is characterized by obstruction and continual inflammation from toxic environmental stimuli, most often cigarette smoke. Due to the disease’s relapsing course, the primary goal of treatment has been focused on stabilization and prevention of exacerbations which ultimately worsen disease severity. With progressive advancements in medical research and surgical techniques, lung transplantation has increasingly proven to be a viable option that can improve functional capacity, quality of life, and long-term survival. We present a case of a 70 year old male with an 80 pack year history in an acute exacerbation of COPD with acute on chronic hypoxemic respiratory failure who desires and is actively pursuing placement on the lung transplantation waiting list for a bilateral lung transplant.

**56 Arsenic remediation by MLHE 1**  
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Faculty Advisor: John Stolz, Ph.D.

Arsenic contamination in drinking water has affected millions of people globally for decades now. It is due primarily to the speciation and mobility of arsenic oxyanions in subsurface aquifers through changes in redox chemistry. Though this carcinogen is harmful for humans and a variety of microbes, certain bacteria utilize arsenic as their energy source for growth. One such bacterium, Alkalilimnicola ehrlichii strain MLHE 1 grows anaerobically by oxidizing arsenite [As(III)] to arsenate [As(V)] coupled to the dissimilatory reduction of nitrate to nitrite. The arsenite oxidase, Arx A, is more similar to the dissimilatory arsenate reductase (Arr), but has bidirectionality and works as arsenite oxidase in vivo. Our goal is to fully characterize the Arx from MLHE-1 and to test its efficacy for application in bioremediation technologies.

**57 Treatment of behavioral disturbances of advanced frontotemporal dementia in the inpatient psychiatric setting**  
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Frontotemporal dementia (FTD) is a rarer form of dementia that affects those in their 50’s and 60’s. It is rapidly progressive and patients often suffer from aggression, verbal outbursts, impulsiveness cognitive decline, language deficits, and other behavioral changes. There are currently no FDA-approved therapies for these symptoms and data on therapeutic strategies is limited. The current best-studied treatment is SSRI therapy, but the data on alternative medications is limited to a few case reports and case series. We present a case of 63-year-old white female with a 3-year history of progressive FTD and depression who was admitted to the inpatient psychiatric presenting with memory impairment, verbal outbursts,
emotionally labile agitation, and aggressive behavior. Her symptoms were successfully treated utilizing a combination of Depakote and risperidone. We postulate that risperidone may work through reducing dis-inhibition that is present in many sufferers of FTD, and that Depakote may be effective through its action on GABA and NDMA receptors in the central nervous system.

58 Drawing conclusions on aphasia: An examination of the relationship between word retrieval, drawing, and semantics
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Aphasia is an acquired language disorder that can affect an individual’s verbal expression, auditory comprehension, and ability to read and write. The hallmark characteristic of aphasia, word retrieval impairment, can significantly impact a person’s ability to communicate their needs and ideas. Treatment for these deficits typically focuses on either restoring a person’s language skills or teaching compensatory strategies (e.g., gesturing, drawing) to increase communicative effectiveness during communication breakdowns. In aphasia therapy, drawing has predominantly been used as a compensatory strategy. Emerging evidence suggests that drawing may have restorative effects on word retrieval impairments by providing an alternate route to accessing the semantic system (Farias, Davis, & Harrington, 2006, p. 54). However, our current understanding of this theoretical relationship between the semantic system, drawing, and word retrieval abilities is limited. Therefore, the purpose of this study was to examine this relationship to further develop the field of speech-language pathology’s theoretical understanding. Ten participants with various aphasia types and severities completed systematically sequenced experimental tasks, which measured confrontation naming accuracy before and after drawing and a semantic feature cueing (SFC) task for target nouns. Overall, drawing slightly increased naming accuracy while SFC slightly decreased it. Aphasia severity demonstrated a fair, negative relationship with the amount of semantic content in drawings. Clinical implications and research directions will be discussed.

59 Treatment failure for psychotic major depression complicated by catatonia
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Faculty Advisor: Brenda Swanson-Biearman, DNP, MPH, RN

The variety of presentations seen with most psychiatric conditions, such as psychotic major depression (PMD) and catatonia in this case, poses both diagnostic and treatment obstacles for providers. In addition, treatment failure for these conditions leaves patients with few options outside of long-term psychiatric care.

A 22-year-old white male was admitted to the inpatient behavioral health unit with a diagnosis of major depressive disorder and suicidal ideations with a plan. He was immediately started on Celexa 20mg for mood symptoms. Within three days of admission, he began exhibiting catatonic features which led to the initiation of Ativan 2mg PO TID. A partial response to Ativan was demonstrated by increased volume and quality of speech, and resolution of waxy flexibility. One week following admission, the patient began exhibiting psychotic symptoms and the second generation antipsychotic (SGA) Zyprexa 10mg PO
BID was added to his medications. Since little clinical improvement occurred after seven days on Zyprexa, Ativan was tapered and one session of electroconvulsive therapy (ECT) was administered. The patient’s catatonic features resolved with ECT; however, he began hallucinating and became increasingly agitated. Two different SGAs, Seroquel and Risperdal, were given in sequence for two weeks each; however, both failed to relieve psychotic symptoms. The patient refused subsequent sessions of ECT so Clozaril was initiated due to his previous treatment failures. The patient was discharged to the state hospital for long term psychiatric care due to treatment failure with SSRIs, SGAs, and ECT.

This case outlines the treatment course provided to a patient with refractory PMD complicated by catatonia. The unfortunate outcome of this case provides insight on the need for additional, safe, medication options for patients that are refractory to current treatment options.

60 DNA metabarcoding reveals the dietary niches of a breeding riparian songbird community.
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As the interface between two biomes, riparian zones exhibit a substantial flow of nutrients that cross the aquatic-terrestrial boundary. While it has long been recognized that contributions of leaves, woody debris, and terrestrial insects from the surrounding forest are essential sources of energy for stream biota, recent attention has highlighted the importance of aquatically derived resources to the terrestrial ecosystem. The emergence of adult insects from their aquatic larvae is the primary mechanism for the transfer of nutrients across the aquatic-terrestrial boundary, thus providing an important prey resource subsidy for breeding songbird communities. However, the taxonomic composition and structure of dietary niches within these avian communities is poorly understood. The advent of next-generation DNA metabarcoding provides a tool for understanding avian diets with unprecedented taxonomic resolution.

In this study, we utilize a non-invasive, metagenomic approach to (1) determine the importance of emergent aquatic insects to riparian nestling diet and (2) investigate dietary niche overlap between three common Neotropical migrants that breed in riparian zones of Southwestern Pennsylvania: Acadian Flycatcher, Louisiana Waterthrush, and Wood Thrush. Our analysis revealed that nearly 100% of riparian nestlings consumed aquatic taxa, thus demonstrating the importance of emergent aquatic insects as a food resource for migrants during the critical period of nest provisioning. Aquatic prey subsidies were particularly important to the diet of the obligate riparian Louisiana Waterthrush nestlings, whereas the more generalized foraging behaviors of Acadian Flycatcher and Wood Thrush resulted in a diet rich in terrestrial taxa. Conversely, the diets of Acadian Flycatcher and Wood Thrush nestlings exhibited a high degree of dietary niche overlap, which suggests that these species may compete for prey where resources are limited or breeding territories overlap.

61 Understanding the role of serotonin receptor subtype 7 (5-HT7) in comorbid pain and depression using novel compounds derived from marine cyanobacteria
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Faculty Advisor: Benedict Kolber, Ph.D.
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. A significant amount of preclinical research in pain and depression targets similar G-protein coupled receptor (GPCR) classes, implying that GPCRs may be useful in treating this comorbidity. Our efforts have sought to characterize a poorly understood GPCR, the serotonin receptor subtype 7 (5-HT7), and the role that it plays in comorbid pain and depression. Our approach for targeting this receptor uses compounds isolated from marine cyanobacteria collected from the Las Perlas Archipelago off of the coast of Panama. Compounds that were screened and tested showed strong affinity for the 5-HT7 receptor. These compounds were screened for in vivo activity using a series of pain and depression behavioral assays. Compounds were delivered into male and female C57Bl/6J mice via intra-cerebroventricular (ICV) cannulas and injections into regions of the brain with high expression of the 5-HT7 receptor, such as the CA1 region of the hippocampus. Compounds were tested in naïve mice or in mice subjected to a model of comorbid pain and depression, the Spared Nerve Injury (SNI). 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 induces effects in several affective behavioral assays. Specifically, we have found cyanobacterial compounds that induce antidepressant and anxiolytic-like effects in male mice using the forced swim and elevated zero maze tests. These antidepressant and anxiolytic-like effects were found to be specific to males, as no behavioral effects were found in female mice. Our results suggest that cyanobacteria produce compounds with neuroactive properties that may be useful in understanding comorbid pain and depression.

62 Concomitant diagnosis of Noonan syndrome with aortic stenosis and situs inversus
Jacob Matter
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Noonan syndrome is a genetic disorder that affects many aspects of an individual’s anatomy and physiology. Common complications include facial feature abnormalities, heart defects and other skeletal deformities. The most common heart defect is pulmonary valve stenosis. These complications can heavily burden the lives of patients affected by the disorder. Additionally, situs inversus is an uncommon congenital condition that causes the shift of the internal organs from one side to the other on the sagittal plane. While this condition may not pose serious health complications on its own, a concomitant diagnosis of another serious condition may result in increased morbidity. We present a case of a 54-year-old male with significant past medical history of Noonan syndrome and situs inversus who presented for follow up after a recent emergency room visit for new onset chest pain and was found to have aortic stenosis. This case presents a concomitant diagnosis of Noonan syndrome with aortic stenosis and situs inversus.
**63 Pesticide-resistant Zooplankton Do Not Buffer the Effects of Chlorpyrifos on Amphibian Neurodevelopment**

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Biology | Bayer School of Natural and Environmental Sciences  
Faculty Advisor: Sarah Woodley, Ph.D.

Pesticide use affects aquatic communities directly and indirectly. Previous work showed morphological and neurodevelopmental changes in tadpoles exposed to the pesticide chlorpyrifos (CPF; 5 and 20 ppb) in mesocosms. It is unclear if effects resulted from direct CPF exposure or from trophic interactions due to a decline in zooplankton. This study aimed to determine if CPF affects brain anatomy when the trophic environment is not altered and to determine the extent of protection that pesticide-resistant zooplankton have on an aquatic community. Lithobates pipiens tadpoles were exposed to 0 ppb or 1 ppb CPF and then reared to metamorphs in mesocosms containing either CPF-resistant or CPF-sensitive Daphnia pulex zooplankton. In mesocosms with CPF-sensitive zooplankton, relative body length and head width of metamorphs was reduced; the reverse was found in metamorphs from mesocosms with CPF-resistant zooplankton. Exposure to CPF resulted in metamorphs with relatively wider optic tectum, medulla, and diencephalon compared to controls, regardless of whether zooplankton was CPF-resistant. Hence, survival of zooplankton in the presence of CPF stabilizes the food web and can have buffering effects on metamorph body shape, but protecting the food web did not mitigate the effects of CPF on metamorph brain morphology. This study provides evidence of the dangers of exposure to low, ecologically relevant doses of organophosphorous pesticides on neurodevelopment in vertebrates.

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**64 Prophylactic Appendectomy in a Patient with a Family History of Primary Appendiceal Cancer**

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Faculty Advisor: Kristin D'Acunto, MPA, PA-C

Primary cancer of the appendix is a rare diagnosis that is associated with poor prognosis. Carcinoid tumors comprise > 50% of primary appendiceal cancers. Generally, these are neuroendocrine tumors (NETs). Most NETs occur in the distal third of the appendix. Thus, patients tend to present asymptotically until the tumor becomes very large or metastases to distant lymph nodes. The familial risk involved is the same as other colorectal neoplasms – an increase 2-6 fold in patients with first degree relatives. Molecular testing can reveal BRAF and RAS oncogene mutations that block epidermal growth factor receptors (EGFR) that can be used for treatment. Consequently, BRAF or RAS mutations in any colorectal cancer have poorer prognosis. We present a case of a 37 year old female with a 42 year old sister who was diagnosed with metastatic appendiceal cancer of mucinous adenocarcinomatous etiology with RAS mutation. Following this diagnosis, colonoscopy was performed on the patient, revealing a 6 mm tubular adenomatous polyp that was resected from the sigmoid colon. Prophylactic appendectomy was performed due the patient’s high risk.
65 Length Change of the Short External Rotators of the Hip in Common Stretch Positions
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Stretching of the deep rotator muscles of the hip is commonly employed in patients with lumbosacral, sacroiliac, posterior hip, and buttock pain. There is limited research that demonstrates the effectiveness of common stretching techniques on the short external rotators of the hip. PURPOSE: To evaluate length change of the inferior (IP) and superior (SP) piriformis, superior gemellus (SG), obturator internus (OI), and inferior gemellus (IG) during several commonly used stretching positions. METHODS: Seventeen hip joints from 9 embalmed cadavers were skeletonized leaving only the short external rotators and joint capsule intact. Polypropylene strings were attached from the origin to insertion sites of each muscle to represent the musculotendinous fibers. The change of length (mm) from the anatomical position to 4 specific stretch positions: 1) 45° internal rotation from neutral flexion/extension, 2) 45° external rotation with 90° hip and knee flexion, 3) 30° adduction from 90° of hip and knee flexion, and 4) the supine piriformis stretch, were recorded. RESULTS: There was a significant effect on length change based on the stretch position, F (15,166) = 14.67, p < .0005; Wilk’s Λ = .097, partial n2 = .540. The greatest length change for the SP, IP, and the SG occurred when positioned in 30° adduction from 90° of hip and knee flexion, and 4) the supine piriformis stretch, were recorded. The OI and IG had the greatest length change with 45° internal rotation from neutral flexion/extension followed closely by 30° adduction from 90° of hip and knee flexion. CONCLUSION: The three stretch positions that caused the greatest length change were: 1) 30° adduction from 90° of hip and knee flexion, 2) 45° internal rotation from neutral flexion/extension, and 3) 45° external rotation with 90° hip and knee flexion.

66 The Use of the Holistic Representation Model in Juvenile Defense and Education Law Clinics to Improve Functioning, Lower Recidivism, and Improve Treatment Support
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According to the National Center for Juvenile Justice (2013), more than 31 million youth were under juvenile court jurisdiction in 2013. While the contributors to juvenile delinquency are varied and complex, mental health diagnoses (Kretschmar, Butcher, Kanaray, & Devens, 2015), substance abuse issues (Chassin, 2008), and school problems (Christle, Jolivette, & Nelson, 2005) are the most commonly cited contributors to adolescents’ involvement with the juvenile justice system. While these risk and protective factors have been identified, Teplin et al. (2005) found that few juvenile offenders receive assessment, evaluation, or intervention prior to their involvement with the courts. Therefore, many of these adolescents’ underlying and unaddressed needs are first identified when they come in contact with the juvenile justice system. One solution offered by scholars is the Holistic Representation Model (HRM), an individualized, strengths-based, family-centered, and culturally sensitive approach to treatment. Through the HRM, members of the multidisciplinary team are able to focus on the client’s strengths and protective factors, while addressing their underlying needs and risk factors that can
contribute to recidivism. McCarter (2016) found that when social work services were provided to clients in addition to traditional legal representation, adolescents’ functioning improved significantly. The current study compares the usefulness of holistic representation on longitudinal measures (i.e., school outcomes, delinquency outcomes), where the student attorney (from Duquesne University) is responsible for developing a plan for the client’s defense and the other members of the multidisciplinary team (i.e., social worker student from the University of Pittsburgh and school psychologist student from Duquesne University) are responsible for the individualized treatment development, such as collaboration with service providers, community members, schools, and families. The goal of this approach is to allow lawyers to gain a greater understanding of their client from a holistic perspective and gain a better understanding of the underlying factors related to their client’s difficulties (Steinberg, 2005) as well as developing tailored treatments for youth that we hypothesize will increase school variables and reduce recidivism and other delinquency outcomes.

67 Porphyria cutanea tarda (PCT) as an atypical, initial presentation of infection with hepatitis C virus (HCV)
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Porphyria cutanea tarda (PCT) is a rare condition that is chiefly characterized by the development of bullae on sun-exposed areas in response to hepatic deficiency of the enzyme uroporphyrinogen decarboxylase (UROD). It is most commonly acquired by a combination of factors, including infection with hepatitis C virus (HCV) or HIV, iron toxicity, alcoholism, or estrogen excess. Specifically, of those who are HCV positive, only 1-5% will develop clinical PCT, most of whom are middle-aged at initial diagnosis, while the remainder either present asymptptomatically or with non-specific complaints such as abdominal pain, nausea, or jaundice1. We present a case of a 26-year-old male with an 8-year history of IV drug abuse who solely exhibited asymptomatic bullae on the dorsal aspects of his hands that he developed one year prior to his initial, incidental diagnosis of infection with HCV. With IV drug abuse and alcohol consumption being his only two risk factors, he developed an exquisitely rare condition prematurely and extensively.

68 The Coexistence of Acute Intermittent Porphyria and Systemic Lupus Erythematosus
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Acute intermittent porphyria (AIP) is a hereditary syndrome caused by the disruption of heme production in the liver, causing effects on the visceral, peripheral, and central nervous systems. Systemic Lupus Erythematosus (SLE) is a similar autoimmune disorder in which autoantibodies attack organ systems throughout the body. Both of these conditions may present with non-specific symptoms making diagnosis challenging. The coexistence of these conditions is rare and the pathogenesis behind each makes co-management difficult. This report of a 45-year-old female with a history of AIP and SLE displays the difficulty of co-managing two similar genetic conditions. The patient’s symptoms of abdominal pain, photosensitivity, neuropathy, chronic pain, and anxiety are symptomatically managed
with Fentanyl TD daily and weekly Panhematin treatments via subclavian vein central port. These treatments regulate heme production to reduce the number of AIP attacks in which the trigger is unknown in her case. The underlying condition of SLE is hypothesized to elicit a response. Similar triggers in both conditions, physical exam findings, treatment, and the role of genetics will be explored and connected in effort to shed light on the coexistence of these two disorders.

69 Dose-dependent effect of walking exercise on pressure pain in female subjects
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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 with other conditions, such as cancer and obesity. Although numerous pharmacological interventions exist to treat chronic pain, few have proven to be effective. Exercise has been frequently touted as an effective treatment in reducing chronic pain. However, the most efficacious dose of exercise has yet to be established. The purpose of this study is to determine the most optimal dose of exercise required to reduce acute pain in healthy female subjects with the goal of translating these results to clinical trials. After screening, healthy participants were randomized into 1 of 4 groups: control (no exercise), low dose exercise (3x/wk), moderate dose exercise (5x/wk) and high dose exercise (10x/wk). Over a 5-day period, participants performed 30 minutes of moderate intensity walking on a treadmill during assigned exercise days. Sensitivity thresholds to painful pressure stimulation were examined at baseline and post-exercise intervention. Participants also rated the intensity and unpleasantness of a constant pressure stimulus. Significant results have been found in both the moderate and high dose exercise groups, with both groups demonstrating reduced sensitivity to pressure intensity and unpleasantness. The moderate dose group had the greatest reduction in ratings of pain. This suggests that our lowest dose of exercise is not enough to reduce pain and that the moderate dose of exercise may be optimal to translate to the clinic. Overall, the results of this study will have important implications for prescribing exercise to chronic pain patients.

70 Educational Disparities in Minority Youth with Autism Spectrum Disorders
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Several studies have focused on the relationships between access to behavioral health services and race for individuals with autism spectrum disorders (ASD). However, few studies have examined the relationship between race and access to services in schools. Considering that a large proportion of a student’s day is spent in school, the types of support a child receives is determined by their educational eligibility and the incomplete congruence between the two major documents used for psychiatric diagnosis (e.g., DSM-5 & IDEA), it is of paramount importance to understand how race, special education eligibility and school services are related.

Travers et al. (2014) found that while rates of ASD identification increased from 2000 to 2007, African American and Hispanic children were under-identified when compared to Whites. Another study found
American Indian and Hispanic students at a disadvantage in terms of eligibility when compared to their proportions in the general population (Morrier & Hess, 2012).

Using 2011 data from a nationally representative sample of children ages 6-17 years, we examined children diagnosed with ASD of different races (n=1725; White= 1368, Minority=347) to determine if there were differences in accessing and utilizing school-based services.

Results reveal a difference between race and access to early intervention services, $X^2 (2, n=1628)=14.337, p<0.01$. There were significant differences regarding the number of helping professionals working with a student. Specifically, minority families tended to work with two or less, while white families tended to work with three or more professionals. However, other multivariate results were insignificant for race and type of school-based services provided, (Pillai’s Trace=0.003, $F=0.160, df = (3), p=0.923$).

Results support literature highlighting ethnic disproportionality within the autism eligibility group for special education across the United States. New findings show disproportional access: Whites receiving more early intervention services. Once special education eligible, both groups received similar services in school, but from fewer professionals for minority students. Results underscore the need to further investigate how to ensure all students receive timely, adequate, and appropriate education.

71 22q11.2 deletion syndrome: the missing connection between tetralogy of fallot and psychosis
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The following report summarizes the case of a 17-year-old white male with a past psychiatric history significant for anxiety and depression who presented to the inpatient psychiatric unit on a 201 petition complaining of suicidal ideations and auditory hallucinations. He stated that for one month, he had been hearing disturbing voices that urge him to hurt himself and others, which was increasing his anxiety and depression. His medical history is significant for tetralogy of Fallot, which was corrected with two subsequent surgeries. The most recent corrective surgery was a pulmonary valve replacement in 2014. He reported that he has struggled with anxiety and depression for many years despite pharmacologic treatments including clonidine 0.2 mg daily and Wellbutrin 200 mg twice daily. After other causes of psychosis were ruled out, he was diagnosed with major depressive disorder with psychotic symptoms.

Among patients with a history of tetralogy of Fallot, it has been found that an association between this condition and psychiatric disorders that present with psychosis exists. The commonality between these two separate conditions has been linked to the 22q11.2 deletion syndrome, which is known to cause specific psychiatric and cardiovascular diseases, as well as physical and metabolic abnormalities, allowing for varying presentations among patients. This patient, who has both a history of tetralogy of Fallot and psychosis, presents classically for one who may have the 22q11.2 deletion syndrome. By exploring this possible presentation of the 22q11.2 deletion syndrome, it will allow for the further investigation of the genetic connection between tetralogy of Fallot and psychosis while also providing insight for health care providers to screen for the associated genetic mutation among this patient population.
72 Varicella Infection: a case of severe breakthrough disease following immunization
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Faculty Advisor: Kristin D’Acunto, MPA, PA-C

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Varicella-zoster is an alpha-herpesvirus that primarily infects children and adolescents. The incidence of varicella infections has decreased significantly since the 2-dose vaccine series was initiated in 2003. Breakthrough disease can occur in up to 15% of those that receive the complete vaccine series; these cases usually have milder symptoms and a shorter duration of illness. The case presented is that of a 7-year-old white female seen in the emergency department; she had a diffuse vesicular and maculopapular rash that was extremely pruritic, consistent with varicella infection. She also complained of constitutional symptoms including fever, cough, fatigue and myalgia. The patient received the 2-dose varicella immunization series at 13 months and 5 years old. She had no comorbid medical conditions and was meeting developmental milestones. The patient was treated with acetaminophen for pain/fever and Benadryl for pruritus as needed. She continued to develop new lesions for 14 days and recovered completely 30 days following initial symptom presentation. This patient represents the 5-7% of patients—receiving the two-dose vaccination series—who experience a severe course of illness during an episode of breakthrough disease. The incidence of moderate to severe breakthrough disease is 10-15% in patients who received only the one-dose vaccine. Currently, there are several theories as to why certain patients will not be completely immunized by the varicella vaccination series. This case illustrates the importance of furthering the research to better understand why the vaccine fails in some cases—with the goal of eliminating potentially dangerous outbreaks in the future.

73 Rare Manifestations of Charcot-Marie-Tooth disease
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Charcot-Marie-Tooth disease is one of the most common neuromuscular disorders seen throughout the world today. This disease often causes peripheral neuropathies of a patient’s extremities and atrophy of the distal muscles. Rare manifestations of CMT include vocal cord paralysis and progressive hearing loss which may lead to deafness. No diagnostic criteria exists for these rare side effects. Throughout the literature, there is not a recorded incidence of vocal cord paralysis or hearing loss, however, studies have shown that CMT can in fact cause these manifestations. Treatment for CMT involves a multidisciplinary approach including neurologists to help manage the disease and physical therapists to improve gait, strengthening, and discuss using the benefits of orthotics. Patients also see genetic counselors to see which gene mutation they may have and psychiatrists due to the emotional distress caused by the severely debilitating disease. We present a case of a 52-year old white female who displayed worsening bilateral progressive hearing loss and hoarseness of her voice over one year. She noticed that her hearing has been declining and she is unable to hear low-pitched sounds. Also, she noted that her hoarseness of voice had become more pronounced in this past year. A multidisciplinary
approach to treatment is critical to help improve the many different signs and symptoms this patient is experiencing from Charcot-Marie-Tooth disease. Using various strategies such as orthotics to improve gait, swimming and medications to help relieve the patient of pain, and psychiatrists to better the patient’s emotional state will overall help improve this patient’s quality of life.

74 Genetic Mutation of Cholesterol Metabolism Causes Congenital Hemidysplasia
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Cholesterol biogenesis intermediates (meiosis-activating sterols/MASs), if accumulated in the body, can cause serious dysmorphisms. Two rare genetic mutations are known to cause MAS accumulation: the NAD(P) Dependent Steroid Dehydrogenase-Like (NSDHL) gene on chromosome Xq28, and the Sterol C4-methylloxidase-like (SC4MOL) gene on chromosome 4q32.3. CHILD syndrome (Congenital Hemidysplasia with ichthyosiform nevus and Limb Defects) is an autosomal dominant NSDHL mutation disorder causing hemihypertrophy, agenesis of the cerebellum/corpus callosum, psoriasiform dermatitis, and seizures in patients. The SC4MOL gene mutation can also cause congenital cataracts, developmental delays, and microcephaly. Although these defects cannot be cured, screenings for co-morbidities (inflammatory joint disease, worsening scoliosis/kyphosis, intractable seizures, etc.) are necessary. We present the case of a 16-year-old female with hemihypertrophy, corpus callosum agenesis, psoriasiform dermatitis, seizures, optic nerve hypoplasia, and microcephaly. Despite no official genetic testing, the patient displays characteristics of an MAS accumulation which will help direct further health management and possible therapies.

75 Phototherapy: A New Treatment for Lung Cancer
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Lung cancer is the leading cause of cancer death in the United States, taking more than 160,000 lives each year. We present a case of a 59-year-old white female with past medical history of severe chronic obstructive pulmonary disease, who presented with shortness of breath, cough, and dyspnea on exertion which she attributed to her underlying lung disease. She was following an extensive pharmacological regimen to treat her COPD, which consisted of: Advair, Daliresp, DuoNeb, Singular, and Spiriva. The chest x-ray revealed a large mass in the left lower lobe consistent with lung cancer. The mass was causing endobronchial obstruction contributing to her worsening shortness of breath. After the medical team discussed with her the options for treatment, the final decision lead to photodynamic therapy. Photodynamic therapy was chosen for this patient because she was not a surgical candidate due to her underlying lung disease. She had undergone three separate rounds of treatment with Photofrin as an outpatient. Photofrin is the first FDA approved medication for the treatment of non-small cell lung cancer. After this medication is injected into the bloodstream, it is absorbed by the tumor. Then, a light source is emitted via endoscopic fiber optic scope, which causes the Photofrin to activate and kill of the tumor cells. Its greatest advantage is that it does not harm any of the healthy lung
issue, which is important since this patient has severe underlying lung disease. After each round of therapy the patients breathing significantly improved. After all three sessions, the patient had a CT scan of the chest which revealed that the mass was gone, suggesting that the photodynamic therapy resolved the mass in the left lower lobe of her lung.

76 Mycobacterium fortuitum Bacteremia in an Immunocompetent Patient
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Mycobacterium fortuitum is a rapidly growing mycobacterium and a non-tuberculosis mycobacterium. M fortuitum is known to cause bacteremia in patients with a central line inserted and in patients who are considered immunocompromised. An 84-year-old immunocompetent male who presented with complaints of left wrist induration, erythema, and pain after his left wrist was punctured with a fish spine while fishing. He was diagnosed with cellulitis and treated with Bactrim pending blood culture results. M fortuitum grew on the blood culture after 7 days. The patient was treated for M fortuitum bacteremia with Bactrim and ciprofloxacin for 4 weeks. This is a rare presentation in that M fortuitum bacteremia almost exclusively occurs in immunocompromised individuals or those with central lines inserted. This case highlights that M fortuitum can cause bacteremia in immunocompetent individuals and demonstrates an effective treatment regimen for a condition where no standard treatment regimen is described.

77 Comparison of Differex™ and Organic Differential DNA Extractions for the Acquisition of a Male Profile from Samples that Exhibit Mold Growth
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Backlogged sexual assault cases in crime laboratories have increased dramatically since 2005. These backlogs can range from months to years since collected and stored. The most commonly tested piece of evidence in sexual assault evidence kits is a vaginal swab. If not collected and stored properly, vaginal swabs can develop mold over time. It has become common practice to dispose of samples with excess of mold growth because it is believed that no accurate human DNA profile can be obtained. While this practice may seem rash, it has been determined that the mold slowly degrades the DNA, causing it to become more fragmented. Additionally, mold acts as an inhibitor for polymerase chain reaction (PCR), a crucial step in DNA analysis. PCR inhibition can cause loss of signal, peak imbalance, and/ or allelic dropout. Traditionally, a differential DNA extraction procedure is performed on these samples. This extraction involves wash steps, which aim to reduce the amount of contaminants. While the organic differential extraction technique is regarded as the gold standard, the Differex™ System uses the same principle and is less time consuming. The Differex™ System employs the use of DNA IQ™ magnetic resin to bind the DNA, effectively reducing the sperm loss that is common to other differential techniques. This could allow for a partial or complete male profile to be obtained from samples contaminated by mold growth. This research attempts to compare the effectiveness of the standard organic differential
extraction protocol to the Differex™ System on vaginal swab samples that exhibit varying degrees of mold growth.

**78 Comorbid pain and depression drug discovery from marine cyanobacteria**

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Depression and chronic pain are two common disorders in the US, with 30% of adults reporting chronic pain symptoms (lower back pain, migraines, fibromyalgia, etc.) and between 5% and 10% of adults showing symptoms of major depressive disorder (MDD). Depression and pain symptoms are often concurrent, where up to 40% of patients with MDD report some type of chronic pain. While the connection between pain and depression is not fully understood, there is research that indicates genetic and biological connections between the two conditions. Recent studies have indicated that ligands for 5-HT2C receptors are important in the modulation of depression and pain-like behaviors in rodent models. For this reason, the 5-HT2C receptor could be an important target for comorbid pain and depression therapies.

Our lab has collected several cyanobacterial samples whose extracts were screened for affinity against a panel of G-protein coupled receptors including the serotonin receptors. A green and grey filamentous cyanobacterium was collected off the coast of Isla Mina, on the pacific side of Panama. Crude fractionation of this extract (DUQ0008) yielded two fractions which were active at the 5-HT2C receptor: DUQ0008C (IC50 = 191 ng/mL) and DUQ0008G (IC50 = 98 ng/mL). DUQ0008G has been further fractionated in order to isolate the compounds responsible for this activity. Isolated compounds will be subjected to spectroscopic analysis to elucidate their structure, then tested for their activity in 5-HT receptor binding assays, as well as pain and depression assays. Active compounds will provide knowledge about this receptor that may aid in the development of single drugs to treat both pain and depression.

**79 The Lived Experience of a Person with a Subcutaneous Vascular Access Port: A Mini-Study**

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Purpose: The purpose of this mini-study was to explore and understand the meaning of the patient perspective of living with a subcutaneous vascular access port. By understanding patient experiences, information obtained may be utilized in developing procedures for nursing care of the port that may be beneficial to the patient. Additionally, insight into the topic of interest may be discovered and used in evaluating future work.  
Background: Authors research has shown that pain and anxiety is related to port access; however, a paucity remains in exploring the patient perspective of feelings, emotions and daily experiences related to living with an implanted port and nursing interventions to address patient experiences.  
Methods: An interpretive phenomenological qualitative method of analysis was used to conduct this mini-study. Inclusion criteria included age 18 or older, fluent in English, implanted subcutaneous vascular access port in place greater than six months and accessed with a Huber needle minimally on a monthly basis. Two informants were recruited from an outpatient cancer infusion center.
one informant was interviewed as the result of a referring hospital infusion nurse. Semi-structured interviews were conducted, recorded and transcribed. The interviews were analyzed using content analysis of common topics and categories. Results: Three participants were interviewed for the study. Initially, 16 common topics emerged from the three interviews. When combining the common topics, nine categories were identified: advantages of the port; complications; disadvantages of port; discomfort; emotion; human contact; nurse knowledge of port care; strategies used by patient to make life easier; trust of care provider. Implications: The category, trust of care provider, and nurse knowledge of port care, were topics that surfaced with each informant. Further research should examine nurses’ perspective in caring for ports to explore the potential relationship of nursing knowledge and lack of trust between patients and healthcare providers.

80 Characterization of a Conserved Multi-Gene System Regulating Developmentally-Associated Gene Expression in Streptomyces coelicolor
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Streptomyces coelicolor is a Gram positive, filamentous soil dwelling bacterium that exhibits a complex life cycle including the transition from a vegetative mycelium to a sporulating, aerial mycelium. 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. White (whi) colonies exhibit incomplete sporulation and/or loss of production of the concurrently produced grey pigment. While some of the original mutants have been explored, the developmental functions of many of the identified genes are not well understood. Of particular interest is a three gene regulatory system, with multiple paralogs of each gene present in S. coelicolor chromosome, which are well conserved among other streptomycetes and morphologically complex actinomycetes. In order to explore the roles of these genes in development, one such gene system (comprised of sapR, sapS, and sasA) involved in the regulation of the spore-associated protein (sap) operon, sapCED, was analyzed. In order to investigate the potential roles of this gene system in regulation of this operon, null mutants were isolated by recombineering. Single, double and triple null mutants were isolated and the effects on expression were analyzed by the extraction of spore-associated proteins using a nonlethal detergent wash and were fractionated on a Coomasie Blue stained SDS-PAGE. Analysis shows an increase in the production of the sapCED encoded spore-associated proteins in both single mutants and double mutants of sapR and sapS with no obvious effect on other Saps. Strikingly, in the absence of all three genes, there is no increase in production of the Sap proteins. In addition, data from Bacterial Two-Hybrid analysis and electrophoretic mobility shift assay data suggest a model for SapR and SapS in negatively regulating the development-associated sapCED operon, with SasA potentially having a positive autogenous regulatory role.
81 A Case of Isolated Penile Edema in a Patient with Henoch-Schonlein Purpura
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Henoch-Schonlein Purpura (HSP) is a systemic IgA-mediated vasculitis. Typical manifestations include non-thrombocytopenic palpable purpuric rash located on the bilateral lower extremities and buttocks, arthralgias, abdominal pain, and renal complications, such as nephritis. The pathogenesis involves accumulation of IgA-mediated immune complexes into the vessel walls of affected organs, including the skin, small bowel, kidneys, and major joints. Urologic manifestations of HSP, although rare, can potentially lead to acute urinary retention, obstructive uropathy from adhesions and edema of the prepuce, thrombosis and priapism if the patient’s genitalia are affected. Genitalia involvement seldom occupies more than 35% of cases in male patients, and, in those cases, scrotal edema is the typical presentation. However, our case describes a 9 year-old male, diagnosed with HSP, who presents with isolated penile edema in the absence of scrotal edema one day after the onset of the palpable purpura. The penis had multiple purpuric lesions, and was tender to palpation. Based on his unique presentation, urologic complications could have progressed if the HSP went undiagnosed.

82 Genetic Analyses of a Novel FtsK Homolog, HfkA in Streptomyces coelicolor Development-Associated Chromosome Segregation
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Streptomyces coelicolor is a gram-positive soil bacterium with a complex developmental cycle. During morphological differentiation, the multigenomic syncytial aerial hyphae synchronously divide into strings of unicellular compartments metamorphosing into chains of spores. This involves faithful simultaneous segregation of the replicated large linear genome into nascent prespores. Previously, it has been shown that spores of a parB, smc and ftsK triple mutant strain had a segregation defect of 10% annulate spores, out of which only 25% spores were viable. Another potential ftsK-like gene, hfkA, has not been examined for function during development-associated segregation in S. coelicolor. The purpose of this study was to construct mutant strains of hfkA for phenotypic analyses using DNA staining to analyze segregation. Double deletion mutant strains for hfkA and ftsK were isolated. Although, single deletions of hfkA and ftsK do not have a severe macroscopic or segregation phenotype, the double mutant showed a ≤8% annulate spores, and can be complemented by adding a copy of either hfkA or ftsK, suggesting that HfkA and FtsK are redundant in function.

The double mutant strains of hfkA parB and hfkA smc also showed a segregation defect of ≤ 16% and ≤ 8% respectively, similar to the segregation defects of parB (13%) and smc (7%) single mutant strains. Triple deletion strains for hfkA ftsK smc and hfkA ftsK parB are currently being isolated and will be analyzed for redundancy of function. Additionally, HfkA-EGFP protein localization patterns are also being investigated.

Finally, plasmid constructs were designed to express the C-terminal motor domain of FtsK in a bacterial two-hybrid (BACTH) system. Weak interactions of ‘FtsK with itself, and with two other segregation
proteins ParA and ParJ were observed. Further analyses of the roles of FtsK and FtsK-like proteins might help elucidate the complexities of linear chromosome segregation in this sporulating bacterium.

83 Inhibition of Plasmodium parasites using blood-induced antimalarial molecules from symbiotic microbes.
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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 influence 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, during a blood-meal. Possible conditional promoters were discovered through RNA-seq analysis and screening promoters from conditional homologous genes. These have been cloned into the promoterless GFP expression plasmid pGLFR1. These plasmids were then transformed into the lab strain Asaia sp.SF2.1 and plated on inducing media. GFP fluorescent colonies were collected and screened both in-vitro, in liquid and solid media, as well as in-vivo, inside the mosquito midgut to isolate the promoters that were only induced when blood meal conditions were present. To evaluate the conditionality of the isolates inside the mosquitoes, the transformed bacteria were introduced through a sugar meal. The mosquitoes were then separated for blood feeding and both blood-fed and sugar-fed mosquitoes were dissected and conditional fluorescence of their midguts was evaluated. Promoters from conditional isolates that showed strong expression in-vivo were cloned into an antimalarial construct plasmid, secreting scorpion, and transformed into Asaia. These isolates were fed to mosquitoes which were allowed to feed on Plasmodium infected mice. The number of oocysts per mosquito were counted and compared to control mosquitoes. The isolates that show the strongest malaria repression will be used in further field testing and fitness assessments.

84 Examining the Stability of Explosive Residues on Multiple Surfaces and Time Intervals.
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As a result of the increased terrorism occurring around the world, the attacks by Improvised Explosive Devices (IEDs) are rising, which leaves them as a constant threat. These devices are not produced for traditional uses and are synthesized with home-made components, which makes them unstable and unpredictable. Therefore, additional investigative and analytical efforts are required to identify the explosive elements in IEDs. Both pre- and post-blast residues can be used to identify the explosive element of the IED. Determining the explosive element can aid in the identification of a suspect. These residues can be found at both clandestine laboratories and explosion sites and various swabbing techniques are used to collect the residue. It is known that explosive residues will degrade over time;
however, it is unknown how the time before collection and surface compositions affect this
degradation. Understanding the degradation curve of explosive residues can be instrumental to an
investigation. Additionally, this information can allow analysts to prioritize the analysis of evidence that
is more likely to yield an identification. An alcohol wipe was used as a universal swabbing method to
collect explosive residues from multiple surfaces. Common explosive residues, RDX, TNT, and PETN were
deposited on surfaces of galvanized steel, poly vinyl chloride (PVC), and packing tape. Samples were
collected in triplicate at the following time intervals: immediately, 3 days, 1 week, 2 weeks, 3 weeks, and
4 weeks. Overall 63 samples per residue were analyzed which allowed a total of 210 samples. An
optimized method was developed for liquid chromatography with triple quadrupole mass spectrometry
(LC-QQQ-MS) to identify the explosive compounds. The results of this experiment show the degradation
effects of delayed collection and surface differences.

85 An association between Down syndrome and severe psoriasis potentiating the risk of
cardiovascular events
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Down syndrome is a genetic disorder known to cause numerous complications with lifelong effects. Less
commonly studied is a potential association between Down syndrome and high severity psoriasis. Both
Down syndrome and high severity psoriasis have a cytokine in common called interferon gamma (IFNγ).
IFNγ is produced in excess in those with Down syndrome due to an extra copy of chromosome 21.
Chromosome 21 codes for four different types of interferon receptors, and the activation of these
receptors leads to the production of interferon stimulated genes (ISGs). ISGs code for several interferons
including IFNγ. While the general population produces adequate amounts of IFNγ, those with an extra
copy of chromosome 21 produce an abundance. Similarly, IFNγ plays a big role in psoriasis. The
presumed mechanism of psoriasis, a chronic inflammatory condition, involves an increased production
in T helper cells 1 and 17 (Th1, Th17) that is driven by cytokine stimulation. In particular, increased IFNγ
levels correlate with increased Th1 levels and has demonstrated to be a major factor in psoriasis
severity. Studies have found a direct correlation between IFNγ levels and increasing severity of psoriasis.
The importance of such a link between Down syndrome and high severity psoriasis lies with
cardiovascular (CV) risk. CV events, such as stroke and myocardial infarction, are major complications of
both high severity psoriasis and Down syndrome. Therefore, the presence of both conditions
compounds one’s CV risk. Presented is the case of a 45 year old female with Down syndrome and plaque
psoriasis of increasing severity. One week after presentation of the worsening condition, the patient had
passed of an acute myocardial infarction (AMI).

86 Discovery Of Dopaminergic Ligands From Panamanian Cyanobacteria
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Cyanobacteria are a phylum of prokaryotic bacteria that can synthesize a multitude of natural products,
including peptides, polyketides, and mixed biosynthetic compounds. These products are structurally
similar to endogenous G-protein coupled receptor (GPCR) ligands, and can mimic their binding to GPCRs. Natural products that can interact with GPCRs could therefore be potential leads for new therapeutics.

The five dopamine receptors (D1-D5) are members of the GPCR family and play a key role in the brain and body. They have been implicated in different cognitive functions, such as memory, learning, reward, and addiction, and are involved in several neurological disorders, such as Parkinson’s, schizophrenia, depression, and attention deficit and hyperactive disorder (ADHD). Dopamine-related disorders are difficult to treat, as multiple receptors can influence the pathology. Also, a single ligand can have varying effects in the body acting via the dopaminergic receptors.

The goal of this project is to find cyanobacterial natural products that target dopamine receptors and could be potential leads for therapies for dopamine-related disorders. Cyanobacteria were collected from Panama, and extracted to yield extracts 2063 and DUQ0007. Fractions were obtained via silica gel chromatography, and assayed by radio-ligand competition binding at a panel of GPCRs. Fraction 2063i, eluted using 100% MeOH, was shown to have affinity for D1 and D3, with 50% inhibition of binding at D1 with an IC50 of 3 μg/mL, and 39% inhibition of binding at D3 with an IC50 of 3 μg/mL. Fraction 0007i, eluted using 100% MeOH, was shown to have affinity for D3, with 51.9% inhibition of binding with an IC50 of 23 ng/mL. Attempts to further separate and purify the compounds showing these activities are currently being made in the lab. Once isolated, novel compounds will be new leads as therapies for dopamine-related disorders.

87 Analysis of a Novel Gene for Development-Regulated Chromosome Segregation in Streptomyces coelicolor

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Streptomyces is a filamentous, spore-forming bacterium living largely in the soil. Chromosome segregation in bacteria plays a vital role during cell division. In Streptomyces coelicolor, in addition to commonly known proteins ParA (ATPase) and ParB (centromere-binding protein), another novel protein, ParJ, was reported to be involved in the chromosome segregation and cell division possibly by affecting depolymerization of ParA. SCO1997 is a paralogue of ParJ (25% identity and 43% similarity). Of interest, both proteins are actinobacterial signature proteins, which suggests that the two proteins are likely to have some novel functions that are unique to actinobacteria. In order to investigate the role of SCO1997 and the interplay between SCO1997 and ParJ, sco1997 single and sco1997parJ double mutants were constructed using recombineering. Preliminary results showed a slight chromosome segregation defect in the double mutant. Also, both SCO1997 and ParJ were expressed and purified and consistent with the reported result, ParJ exhibited a strong ATPase activity in vitro. However, no ATP hydrolysis was detected for SCO1997. To explore the potential interaction partners between SCO1997 and other known segregation proteins, a Bacterial Two-hybrid system (BACTH) was used to co-express the fusion proteins of interest. Preliminary analysis showed that SCO1997 can interact with itself, but cannot interact with ParJ.
88 Analysis of Blood Spatter Formation on Stain Resistant Fabrics
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Bloodstain patterns provide valuable information on the events that occur during a crime and assist investigators in the reconstruction of an incident. Bloodstain pattern analysts examine, categorize, and interpret bloodstains based on their shape, size, and patterns. However, the surface that bloodstains are on can affect the stain formation. The forensic science community understands the formation of stains on nonporous surfaces because only the roughness has an impact on the stain. However, many scenes involve bloodstains on porous surfaces, such as apparel, household textiles, and upholstery. Unfortunately, analysts cannot provide the same level of confidence in the analysis of bloodstains on these surfaces because of the complex structure of textiles. It is important to consider both the type and texture of the fabric and understand how these characteristics affect bloodstains.

The purpose of this research was to examine and compare impact bloodstain patterns on different fabrics that have been treated with stain repellent. Fabrics included khaki pants, denim, a dress shirt, a polo, pillowcases, and a tablecloth. For each fabric, a section of it was chemically treated with a stain repellent spray. A rat trap was utilized to create impact blood spatter stains. Comparisons were made between the fabric and control bloodstains on butcher paper, bloodstains on chemically treated and regular fabrics, and different compositions and textures of fabrics. The results show that the blood spatter does not absorb into the stain resistant fabrics, causing a difference in the shape and size of the stains. This could affect the analysis of the pattern causing the analyst to misinterpret the events of the crime scene. The documentation of the stain sizes, shapes, and characteristics on the different fabrics will aid bloodstain pattern analysts in understanding how stain resistant fabrics affect bloodstains.

89 Promoting healthy relationships in adolescents with autism spectrum disorders
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The current study examines the usefulness of a comprehensive educational and behaviorally based curriculum, Healthy Relationships, which is designed to assist school-based mental health professionals in the facilitation of appropriate personal hygiene self-care (Module 1), sexuality education (Module 2) and increasing appropriate social and interpersonal interactions (Module 3) in adolescents with ASDs. Four participants ultimately met all inclusion criteria: ages of 15-19, diagnosis of ASD from an independent evaluator, completed the intervention in its entirety, baseline data was established, follow-up data was collected, and parent report t-score on the Social Responsiveness Scale (SRS) were 76 or higher indicating social deficits are a significant impairment in daily functioning.

Module 1: Basic Hygiene includes lessons that include hand washing, showering and bathing, proper dental care, toileting, bedroom organization, and privacy. Module 2: Basic Biological Sex Education addresses puberty, male and female anatomy, intercourse, and pregnancy and childbirth. Module 3: Developing Relationships includes differentiating between friends, acquaintances, and bullies, small talk, private talk, showing appropriate affection, dating, and social media and internet safety.
Findings suggested that although these students have severe interferences in everyday social interactions, based on their SRS scores, they were able to gain and retain knowledge from the curriculum. Data indicates that retention of knowledge and skills was more consistent in Module 1, which could be due to the students having a pre-existing experiences and/or longer practice with skills given its primacy in the intervention. Module 2 skills were not assessed. For module 3, there was a slight decrease in initial demonstration of skills for all students when the first retention probe was administered. However, throughout the remainder of the retention probe administrations, all four students demonstrated a continued gain of knowledge and skill set.

90 Trashed Perception? A Socioecological Comparative Investigation
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Sustainability is the future. Each year, Duquesne University invests thousands in sustainable practices, from waste management to reducing our carbon footprint on campus grounds, in order to ensure that we are working towards a sustainable future. However, many students on campus are unaware of the lengths to which Duquesne Facilities Management and Groundskeeping go to provide opportunities for students to engage in recycling and sustainable practices. Preliminary research in this area suggests that students have a poor view of recycling and sustainability at Duquesne. In other words, individuals think that the university does not make an effort to promote sustainability or encourage recycling among members of the university community. These misperceptions, due perhaps to a lack of familiarity when interacting with the processes (misunderstanding a single-stream recycling receptacle, for example) may lead to reduced recycling and sustainability efforts on the part of the students who are not well-informed of a process and its effectiveness. This research aims to understand and describe the relationship between perceptions of sustainability efforts at Duquesne University and students’ individual recycling behaviors on campus in detail, so that future efforts may be made to improve community-wide sustainability education, and hopefully close the gap between knowledge and action.

91 A Seasonal Comparison of the Passive Abandoned Coal Mine Remediation System at Wingfield Pines
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Abandon mine drainage (AMD) in Pennsylvania results in a significant amount of mine pollution entering local watersheds. One solution used to lower the contaminant levels is passive remediation in which contaminants are removed through a series of settling ponds and a wetland. Wingfield Pines, in Bridgeville, PA, contains a passive remediation system. It consists of an aeration pond, four settling ponds and wetlands before water is diverted back into Chartier’s Creek, which is part of the Ohio River watershed.

Mixed water and soil samples were taken from the beginning of each pond, the end of the remediation system and just before the water flows back into Chartier’s Creek in April 2015, July 2015, October 2015,
and January 2016. The samples were centrifuged and separated, and the water was sent to an independent lab for water chemistry analysis of aluminum, barium, copper, lead, zinc, manganese, iron, strontium, nickel, arsenic, cadmium, and selenium levels by ICP-AES and sulfate levels by IC. DNA was extracted from the soil samples and was tagged with a unique 16S rRNA Illumina PCR tag (http://www.earthmicrobiome.org). The amplified 16S rRNA fragments of the chromosomal DNA were analyzed by high-throughput sequencing using MiSeq. The data (~2.7 million sequences) was quality filtered and analyzed using python and Qiime programs (Caporaso, 2010). The data show a variety of differences including spikes in different metal levels (1 site in summer, a different site in fall) as well as the type and relative abundance of bacteria communities present. Proteobacteria were most prevalent year round, though prevalence at the Class level varied. Cyanobacteria were only high in the summer. The bacterial communities at the beginning of the remediation change dramatically throughout the year, while the end of the remediation remains fairly constant. The results suggest that the remediation effectiveness and bacterial richness at Wingfield Pines changes, depending on the time of year and contaminate levels.

92 An abnormal presentation of drug induced hepatic encephalopathy
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Cryptogenic cirrhosis has been defined as cirrhosis of unknown etiology. Patients with this diagnosis have no known prior exposure to hepatitis, genetic predispositions, or alcohol consumption. The following report summarizes the case of a 72-year-old white female with a significant past medical history of cryptogenic cirrhosis diagnosed via ultrasound, type 2 diabetes mellitus, and atrial fibrillation who presented to the outpatient clinic with progressive confusion and altered mental status for two days. The patient was recently hospitalized three days prior for an episode of paroxysmal atrial fibrillation. During her stay, her cardiologist discontinued her sotalol and diltiazem, and initiated Rythmol 225mg PO TID, and metoprolol 50mg PO BID to control her atrial fibrillation. The patient was then discharged home with a diagnosis of paroxysmal atrial fibrillation. The patient presented to the clinic three days after discharge. She was unable to lift her legs or arms, and complained of generalized pain throughout her entire body. She was immediately sent to the emergency room. Upon admission, the patient’s ammonia level was 240 mcg/dL while liver enzymes, CBC, chest-x-ray, and troponin levels remained unremarkable. Although there are many case studies of drug induced hepatic encephalopathy and the rise of aminotransferases in response to hepatic injury, this case is a unique presentation of drug induced encephalopathy without abnormally elevated liver enzymes. This patient was given propafenone (Rythmol) for the treatment of atrial fibrillation, which resulted in the induction of hepatic encephalopathy, however, there was no increase in aminotransferase levels, only an elevated ammonia level of 240mcg/dL. The purpose of this case study is to further evaluate the correlation between cirrhosis, propafenone (Rythmol), and hepatic encephalopathy without abnormally elevated liver enzymes.
93 Pittsburgh's Crusaders: The Women's Temperance Crusade in Pittsburgh, 1874
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Faculty Advisor: Elaine Parsons, Ph.D.

Despite its position as one of the largest mobilization efforts by women for social reform in American history, surprisingly little attention is given in recent research to the Women’s Temperance Crusade of 1873-1874. Especially lacking are case studies of the crusades as they occurred in individual cities. These separate studies are crucial to establishing and understanding both local and national trends within the movement itself. The scholarship discussing the crusading organization within Pittsburgh is particularly sparse. This research uses first person accounts and period newspaper articles in order to piece together a comprehensive story of the Women’s Temperance Crusade that took place in the city during the spring and summer of 1874. Developing this history of the efforts to stop the liquor trade by the women of Pittsburgh enables that history to be evaluated both against and with other efforts nationwide, providing invaluable information about the crusades collectively. The city’s crusades illustrate many of the methodological patterns of crusaders elsewhere, while simultaneously demonstrating the uniqueness of its own concentrated effort. This history is also instrumental in clarifying the broader contributions that the Pittsburgh crusaders made to nationwide temperance activism in general, asserting their integral role within the history of that movement. This research includes a historic map replicating typical crusading routes within the downtown region of Pittsburgh. This map helps to pinpoint locations of importance or interest in regards to the women’s crusade. Recognizing that further research can and should be done to more fully develop the part played by Pittsburgh’s women during the temperance crusades, this projects provides the basis and firm groundwork for a more detailed local history which in turn provides for a richer understanding of a national history of social reform activism and women’s studies.

94 "The most obscure spot on the face of the Globe": The Coal Boom and Post-Industrial development in Uniontown, Pennsylvania
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Faculty Advisor: John Mitcham, Ph.D.

For many residents of western Pennsylvania, the story of the region’s post-World War II economic decay is neither new nor particularly dynamic. At the end of World War II, the coal and steel industries relocated away from the Midwest resulting in the wholesale dismantling of entire local economies. Thus the story of post-war Western Pennsylvania is very much the story of economic decimation. However, within this paradigm are a dearth of unique stories of small towns and cities trying to reckon with the upheaval of their economic lifeblood. This story is particularly pronounced in the history of Uniontown, Pennsylvania.

This paper will show that Uniontown maintained a unique approach to post-war decay stemming from a distinct and robust history. Throughout the post-War years, the people of Uniontown consistently illustrated a self-reflective and self-corrective spirit that was not necessarily a function of post-war hardship, but rather a shared value dating back to the city’s colonial origins. This paper will begin with
Uniontown’s founding at the hands of the Beeson family. It will then trace the history of Uniontown to the near-present, identifying major instances in which the city’s self-reflective agency was plainly expressed, including: Uniontown’s legal founding, The Civil War, Edward G. Roddy’s Genius of Liberty, The Nutt-Dukes Tragedy, and The Western Pennsylvania Coal Strike of 1927. The paper will conclude by arguing that a series of urban redevelopment plans released from the early 1950s to the present are not only indicative of a populace desperate to recapture its economic prosperity, but also part of a broader trend of self-help and city agency that saturates all of Uniontown’s history.

95 Throwing Like a Girl in Psychotherapy: A Practitioner's Reflections
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With the psychotherapy field dominated by female practitioners, it is important to maintain an awareness of how the feminine experience influences our ways of doing therapy. Using Iris Young's (1990/2005) "Throwing Like a Girl" as a point of departure in my own gendered reflection, I utilize Young's three modalities of feminine motility - ambiguous transcendence, inhibited intentionality and discontinuous unity. I write to understand how my female body experience has contributed to my developing position as a psychotherapist.

96 Urinary tract infections: Staphylococcus epidermidis takes advantage of anatomical defects
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Urinary tract infections in the pediatric population are more commonly found in females than in males. Because males have longer urethras than females, their anatomy makes the colonization of bacteria in the urinary tract less likely. The following report summarizes a case of an 8-year-old boy who presented to his general pediatrics office complaining of a fever, as high as 101.2°F orally, for three days. The patient denied all other symptoms including cough, nausea, vomiting, dysuria, and hematuria. The patient was sent home without treatment under the assumption that his symptoms were the result of a viral illness. He and his parents were instructed to return with development of further symptoms. The patient returned to the office the following week complaining of dysuria and 4/10 bilateral flank pain for 2 days, along with the recurrence of fever overnight reaching 101°F orally. The patient denied urinary frequency, urgency, hematuria, muscle pain, and weakness. Examination revealed a nontender, nondistended abdomen and no CVA tenderness. Urinalysis (UA) at this visit was positive for leukocytes, blood, protein, and epithelial cells. Urine culture (UC) was positive for Staphylococcus epidermidis. After repeating the UA and UC four times due to suspicion of contamination and persistence of the patient’s symptoms, a definitive diagnosis of a urinary tract infection (UTI) due to Staphylococcus epidermidis was made. The patient underwent renal ultrasound and voiding cystourethrogram (VCUG), which relieved grade 3 out of 4 vesicoureteral reflux (VUR). The patient was successfully treated with antibiotics for the acute infection and was referred to urology for further treatment. This case demonstrates the importance of considering Staphylococcus epidermidis as an agent capable of causing UTI and not simply a contaminant. Although uncommon, UTIs in the male pediatric population often occur in the
presence of anatomical abnormalities such as VUR and therefore warrant investigation.

*97 Contraceptive Therapy in a Patient with Tuberous Sclerosis and Schizophrenia

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This case follows a 35 year-old female with a history of tuberous sclerosis, mild intellectual disability, and paranoid schizophrenia who presented to inpatient psychiatric unit with acute psychosis. The patient was rambling and incoherent with auditory hallucinations, sexualized delusions, and the belief that she was pregnant for 2 months. She was prescribed five antipsychotics at the time of admission to control the symptoms including Vraylar 3mg BID, Haldol 15mg BID, Latuda 80mg QD, Invega Sustenna 117mg monthly, and Seroquel XR 400mg HS. Over the course of 19 days in the hospital, medication adjustments were attempted including increasing Latuda, Haldol, and Trazodone to multiple different doses, discontinuing Vraylar and Seroquel, and adding Lamictal 200 mg QD.

After exploring the patient’s history further, we found she started to decompensate 1 month prior to her admission. This was the same time she discontinued monthly Depo Provera injections she received for the previous six years. After meeting with the patient and her mother, it was decided to restart the Depo Provera injections. Over the course of one week, her thought perception, judgment, and insight began to noticeably improve and were nearing her baseline. The patient was discharged home with Vraylar 4.5mg BID, Haldol 10mg BID, Lamictal 200mg HS, Invega Sustenna 234mg qMO, Trazodone 200mg HS, and Depo-Provera 1 mL q3 months and instructed follow up with outpatient psychiatry.

This case discusses the evaluation of a lack of antipsychotic therapy in those with a loss of healthy brain tissue, such as those with tuberous sclerosis. It uses the understanding of how the menstrual cycle can exacerbate the symptoms of schizophrenia in conceiving a distinctive treatment plan. It examines the importance of establishing alternative therapy for those who do not respond to aggressive, standard treatments to help reestablish quality of life and achieve hospital discharge.

98 Delayed Combination Treatment in Paget-Schroetter Syndrome

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Paget-Schroetter Syndrome, or effort-induced thrombosis, is a rare disorder of upper extremity deep vein thrombosis (DVT) caused by compression of the subclavian vein, usually from muscle hypertrophy or anatomical abnormalities. It affects 1-2 people per 100,000 every year, typically occurring in the non-dominant extremity of males more often than females. Thoracic outlet syndrome is usually the underlying cause of PSS, which results in a narrowing of space where the subclavian vein travels under the costovertebral arch. Patients typically present with pain, ecchymosis, edema, and/or weakness of the affected upper extremity. Venous angiography remains the diagnostic imaging of choice. Research is limited regarding treatment modalities of upper extremity DVTs, so treatment approaches are often based on treatment plans created for lower extremity DVTs which are more common. Treatment approaches to these proximal upper extremity DVTs is controversial and can take one of three
approaches. Catheter-directed thrombolysis (CDT) involves aiming an antithrombolytic such as tissue plasminogen activator (tPA) directly at the clot through a venous catheter. A second option is mechanical thrombectomy, which involves entering the vein directly to mechanically retrieve the clot. Lastly, pharmacomechanical thrombectomy (PMT) can be chosen, which is a combination of mechanical clot removal with pharmacologic therapy. This case involves an original plan of only CDT, but was advanced to include mechanical removal after several rounds of anticoagulant were not completely effective in clot lysis. This case brings up the debate as to whether PMT should have been the original treatment plan in order to decrease exposure to antithrombolytic and the amount of time the patient had to be in the Intensive Care Unit for observation.

99 Recurrent Urinary Tract Infections Following the Rezūm Procedure for BPH
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Benign prostatic hyperplasia (BPH) is a common condition in men. Transurethral resection of the prostate is the most common surgical treatment for BPH which is associated with high rates of post-operative complications. These complications include ejaculatory dysfunction in 65% of patients, erectile dysfunction in 10% of patients, urethral strictures in 7% of patients, and urinary incontinence in 3% of patients. The Rezūm procedure is a new, minimally invasive procedure approved by the FDA in late 2015 for the treatment of BPH. The procedure uses transurethral convective water vapor to ablate the dysplastic tissue of the prostate. A major benefit of this procedure is the absence of sexual dysfunction following the procedure. The following case reviews a 70 year old male presenting to an urgent care setting in two separate visits with complaints of dysuria, polyuria, and increased sediment in his urine following the Rezūm procedure one month prior. The patient was diagnosed with recurrent urinary tract infections due to Escherichia coli with the same susceptibility pattern. He was treated with Ceftin following the first presentation with resolution of symptoms, and Macrobid following the second presentation. This may suggest that recurrent urinary tract infections may be a potential complication of the Rezūm procedure.

100 Small bowel obstruction due to congenital bands in 59 year-old
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Small bowel obstructions are commonly caused by adhesive bands, which are most often due to previous surgery, trauma or infection. Rarely, an obstruction may be found due to a congenital band, which is present from birth. The case reported determines an obstruction due to the presence of two congenital bands.

A 59 year-old white female presented to the emergency department with complaints of severe abdominal pain for 2 days with associated abdominal distension, constipation, nausea, and vomiting. The patient denied history of any medical diagnoses or surgeries. Abdominal x-ray series reveal small bowel distension with numerous air-fluid levels suggestive of a high-grade small bowel obstruction. The
patient underwent an exploratory laparotomy, which revealed the presence of two well-vascularized congenital bands: one spanning between the right colon and terminal ileum and the other spanning between the jejunum. Enterolysis was performed, and the bowel was decompressed without need for resection. The patient was stable and able to leave the hospital on post-op day 5.

The case presented here showed the classic presentation of a small bowel obstruction but caused by an unusual source, a congenital band. It is important to note that congenital bands are a possible source of obstruction when medical and surgical history is negative. Congenital bands can also be overlooked as a possible reason for pathology due to their lack of defining signs and symptoms. Thus, it is important to keep congenital adhesions on a differential list when evaluating a patient with a possible small bowel obstruction so as to not delay diagnosis and treatment.

101 Ovarian hyperstimulation syndrome in the emergency department
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Ovarian hyperstimulation syndrome (OHSS) is a rare but potentially life-threatening complication of in vitro fertilization (IVF). It is the result of exogenous human chorionic gonadotropin’s (hCG) vasodilatory effects, causing third-spacing of free fluid and subsequent intravascular depletion. Severe cases may result in dangerous complications such as thromboembolism and respiratory distress. While OHSS is well-recognized within the specialty of reproductive health, many clinicians in the broader medical community are not familiar with the condition. This report summarizes the case of a 31 year old G0 female who presented to the emergency department (ED) complaining of nausea, emesis, abdominal pain and distention, and orthopnea. She had a history of polycystic ovarian syndrome and had completed her first cycle of IVF (during which hCG was used to trigger oocyte maturation) one week prior. Over the ensuing week, she noticed an increase in abdominal girth along with epigastric pain and increasing orthopnea; two episodes of non-bloody emesis occurred the night prior to her ED visit. Initial physical exam revealed a pulse of 111/min and blood pressure of 106/63 mmHg. The patient’s abdomen was visibly distended and distinctly tender in the epigastric region. A complete blood count showed hemoconcentration with a hemoglobin of 16.8 g/dL and hematocrit of 47.6%, and abdominal and pelvic ultrasounds revealed large volumes of free fluid. Phone communication with the patient’s fertility specialist led to the diagnosis of moderate OHSS. The patient was observed for several hours with supportive treatment and then discharged with instructions for close outpatient follow up. Serial hCG levels over the next week showed that the patient was not pregnant, and her symptoms resolved spontaneously over two weeks. As the field of reproductive technology quickly expands, this case illustrates the importance of expanding awareness of OHSS in order to provide appropriate care.
**102 Diversity and Trauma Therapy: Exploring the Intersection of Culture and Practice**

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Similar to the research-to-practice gap that many psychologists face throughout their careers (Courtois & Gold, 2009), disparities also exist between training programs and the need for cultural variations in psychological trauma counseling in the field. While psychologists explore diversity- and psychotherapy-based literature as independent curriculums, training designed to address the intersection of culture and cognitive and emotional responses to trauma is often lacking (Mattar, 2011). This deficiency becomes increasingly important as professionals are forced to rely on their general knowledge of diversity and trauma literature to effectively serve populations in need of culture-specific therapies. This ultimately creates complex difficulties for both professionals and educators, as some have begun to question whether standard mental health practices are applicable to diverse client populations (Mattar, 2011). This paper provides an overview of cultural factors illustrated across psychological domains; including assessment, treatment selection, and counseling (e.g., individual, group). Authors will also discuss why the training and practice of culturally-informed trauma psychology should be of increased importance to existing training programs.

**103 A Community Built in Dirt: The Growth and Decline of Duquesne, Pennsylvania**

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Pittsburgh, Pennsylvania promotes itself as a city that emerged from economic depression following the end of the steel industry that made the city famous. However, visitors to Pittsburgh don’t need to travel far to discover that many of surrounding towns, that were truly dependent on the steel industry, have not had a renaissance. Collapsing churches, shuttered businesses, and failing schools are common problems in many steel towns, especially in Duquesne, Pennsylvania. Like many towns in the Mon Valley, Duquesne was dependent on the local steel mill. The success and failures of Duquesne follow the path of the Duquesne Works steel mill so closely, that it looks like the residents of the city only cared about working in the steel mill. The reality is that the residents of Duquesne were preparing future generations for success beyond the mills. The history of Duquesne does not get the attention that its neighbors, like Homestead and McKeesport, do, but it offers an example of how steel towns built their communities.

This presentation demonstrates how the residents of Duquesne built a community that would give future generations opportunities for growth. It describes how churches, businesses, and schools were built to serve the growing community. However, these institutions would not help the city prosper after the Duquesne Works steel mill closed in 1984. Duquesne still has not found a way to recover. Yearbooks, collected from two generations of the family of the author, are used to collect data on graduation rates, extracurricular opportunities offered to students, and to demonstrate how much faith students had in the quality of their education. Census data is also used to show the growth and decline of the population, as well as several newspaper and magazine stories to document the growth and decline of the city.
Knowledge is Power: Selma Burke and Her Educational Legacy in Pittsburgh

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On July 20, 1975, Selma Burke offered what was billed as her last official contribution to the world of sculpture. She would continue to sculpt for years after, as was her interminable nature, but this offering served as a last farewell to the city of Pittsburgh. With its presentation, she announced her retirement from her professional capacity as educator in the city with the Selma Burke Art Center. This was the final representation of her legacy to the city she had made a home in; not just personally but within the art world as well. This piece was the way in which she wanted to be remembered. Inspired by this work, a sculpture called “Together,” this study explores her work within the community in Pittsburgh. Selma Burke found her voice within the art community through the role as mentor to the next generation of artists. If an individual, regardless of skill level, wanted to participate creatively she was going to do all she could to encourage that spark. Burke prided herself on her ability to educate and inspire the next generation of artists and believed that a love of art was for everyone. She was so dedicated to education that she opened three art schools in her lifetime. Utilizing extensive archival evidence focusing on just one of these schools, the Selma Burke Art Center, this research uncovered just how influential Burke was in Pittsburgh. In studying what education meant to Selma Burke, we can begin to uncover the deeper complexities of what it means to be a female artist.

A Molecular Descriptor to Predict Dispersability of Amorphous Solid Dispersions

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A significant portion of newly discovered active pharmaceutical ingredients (API) suffer from poor aqueous solubility, presenting a barrier to effective delivery in humans. The amorphous form frequently increases the effective solubility, but is less physically stable than the crystalline form. Amorphous solid dispersions (ASDs) are a formulation strategy for overcoming this issue, where a polymer is co-solidified with an API in an attempt to maintain the API in the amorphous state. Unfortunately, identifying an appropriate polymer:API pair is difficult, and often requires a costly trial-and-error approach. It is hypothesized that the propensity of an API to form an ASD with a given polymer (a.k.a. dispersability) depends on a combination of molecular attributes that are determined by the API structure. Molecular descriptors are mathematical representations of molecular properties derived directly from the molecular structure. This work investigates molecular descriptors as predictors of dispersability. Ultimately, a useful molecular descriptor may help to elucidate the physical and chemical properties most important for dispersability.

Co-solidification of API with the polymer copovidone was attempted in triplicate using two methods (melt-quenching and solvent evaporation) at two API concentrations (15% and 75%), resulting in approximately 192 samples. Dispersability classification was based on powder X-ray diffraction, differential scanning calorimetry, polarized light microscopy, hot-stage microscopy, and pair distribution function analyses. Logistic regression was used to model the probability of forming a dispersion as a
function of each molecular descriptor. Results indicate that a single molecular descriptor (R3m) is predictive of dispersability under the conditions studied. R3m has an overall prediction accuracy of approximately 91%, demonstrating its potential usefulness as a rapid screening method to identify promising ASD formulations. The application of this tool has the potential to reduce development costs, and could reduce the time to market for poorly soluble drugs.

*106 “It is my mother—she beckons me to her embrace—I come”: Mother and Daughter Bodies in Mary Robinson’s Vancenza; or the dangers of credulity
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Bodies of work and bodies of women cement matriarchal lineage within Robinson’s Vancenza; or the dangers of credulity (1792), which permit the enlightened orphan, Elvira, to discover her womanhood as she grapples with an impending incestuous marriage. While Vancenza is one of Robinson’s most underappreciated texts and contemporaries often dismiss it as a poorly executed early Gothic romance, I find that the novel successfully disrupts paradigms that limit female agency by providing alternatives to domestic life. I examine the ways bodies of written work alter traditional womanhood in Vancenza; the traditional womanhood presented mimics societal expectations imposed upon women during the 1790s despite the novel being set in the 1400s. Particularly, this paper focuses on the mother’s written bodies of work, which reveal female narratives that alter the course of the daughter’s future. Through this revelation, the daughter establishes a literary tradition through self-authorship, which leads Elvira to promote “self-learning through liberal education and challenge men’s right to the intellectual world” (198). Self-learning establishes these bodies of work as permanent and accessible to future women (Robinson 97). The paper also examines the methods that these women employ to challenge male dominion over intellectual pursuits, which establishes the innate intelligence of the female sex. I argue that the forms of these written bodies establish permanence and a source of female intelligence within the text as the women use them as resources for generational lessons passed on from mother to daughter, creating a matriarchal touchstone that enables a formation of female identity outside of patriarchal control and creates a body of knowledge accessible only to women that works in tandem with the female physical bodies that move throughout the novel in different societies, countries, and cultures to secure female presence, sexuality, and authority as a permanent fixture in public and private spaces.

*107 Christianity, Islam, and African Traditional Religion: A Christology of Mature Differentiation for Inter-religious Trialogue in the Nigerian Context
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The problem of inter-religious dialogue remains a theological perennial, provoking diverse theories, and sometimes, irrelevant detours. In Nigeria, where a particular form of pluralism that seeks to elevate commonalities over particularities prevail, Christology is seen as one of those unitive factors among the three major religious traditions, hence appropriate to promote dialogue (or as it were, trialogue). With
regards to Christianity and Islam, the model advances the positive consideration of Jesus in both the bible and the Qur’an, and as regards the interaction between Christianity and the indigenous religion, this model quickly translates into inculturation anchored on the incarnation. This paper explores the inadequacy of the above framework in the Nigerian context, pointing out that the Christological common ground as applied to the former is weak, and to the later, non-existent, hence its application has either failed or remained superficial. The paper thus advances a Christology of mature differentiation which values the authenticity and uniqueness of otherness, rejects extratextual categories in religious explanation, and remains contextual. It argues that religious differences must not be harmonized as a prerequisite for authentic dialogue. Religions are different, but each capable of fostering relationships. In this proposal, the ideas of George Lindbeck is partially utilized, and the lived experience of the Yoruba people of Southwest Nigeria is explored to demonstrate the practicability of the model. The level of natural and happy admixture of religious faiths in Yorubaland is not a sign of mere conformity for the sake of getting along, neither is it derived from the evaluation of religious traditions as abstract systems, nor the establishment of common grounds, instead it is the acceptance of the presence and legitimacy of other religions as adequate mediators of sacred encounter. The Nigerian proverb: let the eagle perch, and let the kite perch is instructive.

*108 The Story of a Schism: 500 Years of Reformation and Repair*

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This year, on October 31, Roman Catholics and Lutherans will celebrate together the quincentenary of Martin Luther’s posting his Ninety-Five Theses on the Power and Efficacy of Indulgences to the door of All Saints Church in Wittenberg—the unofficial commencement of the Protestant Reformation. This shared celebration will be an ecumenical achievement unimaginable just a few decades ago.

In this essay we will explore why such a simple act of hospitality and Christian charity shared between two Churches was ever taboo—why, that is, there was such a deep and abiding rift between Lutherans and Catholics—and how it has now come to be not only imaginable but actually penciled into the calendars of both Churches. Our enquiry will focus on one of, if not the central issue that lead the the schism: the doctrine of justification.

Our exploration will proceed in two parts: First, we will briefly trace the history of the doctrine of justification, from the Apostle Paul, through the most important Catholic statements of the doctrine in the patristic and medieval periods and Luther’s reformulation of it, to the sixteenth century positions as recorded in the Council of Trent and the Lutheran confessional writings. Then, in the second part, we will turn to the ecumenical movement, beginning with the Second Vatican Council. We will survey the dialogue between Lutherans and Roman Catholics in America and Germany, culminating in the Joint Declaration on the Doctrine of Justification (1999) and the recent Declaration on the Way (2015). Methodologically, will interpret these historical reflections through the lens of what the Lutheran systematic theologian and ecumenist, Robert Jenson calls “the basic flaw in ecumenical theology.”
*Non-Symbolic Exact Quantity Representation in a Language-Impaired Population*

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Both English-speakers whose access to number language is artificially compromised by verbal interference and the Pirahã (an Amazonian tribe without exact number words) appear to rely on analog magnitude estimation for representing non-symbolic exact quantities greater than 3. Here, participants with left-hemisphere damage from stroke and resulting aphasia performed the same 5 nonverbal matching tasks from previous studies. Nonverbal matching performance was poorest when targets were not visible during response (71% correct) and best when targets were presented as subitizable groups of 2 and 3 (98% correct). Coefficients of variation for particular tasks, and significant correlations between target magnitude with both error rate and size across tasks, suggest use of analog magnitude estimation for verbally impaired participants. Western Aphasia Battery-Revised subtest scores were reliably correlated with performance across counting tasks suggesting ways that diverse forms of language impairment may contribute to errors on nonverbal counting tasks. A subset of participants completed additional numeric tests (numeral elicitation, confrontation naming with Arabic numerals, and free counting tests) and tests of nonverbal semantic processing and short-term memory (pyramid and palm trees, and semantic category probe tests) in order to better understand errors on nonverbal matching tasks. Results indicate that deficits reflected by major impairments on verbal counting tests and more general semantic impairments can both contribute to errors in the representation of nonverbal exact-quantity. This study suggests ways that investigations of neurological populations may help us to better understand the bases for language-related effects on nonverbal processing across diverse neurotypical populations.

*Standards of Medicine and the Human Right to Healthcare*

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The right to healthcare is seemingly universal, but in practice, it may not manifest itself in the same way for everyone. There are areas in our worldwide community in which citizens do not fully ‘experience’ their right to healthcare, nor is that right valued or upheld. If it is internationally agreed upon that a right to healthcare exists, what is the solution if a country as a whole is unable to uphold this right? Factors such as poverty, economic distress, or environmental concerns can all have an effect on a country’s healthcare system and its implementation. Each country may have to determine its own priorities and decide which methods are most appropriate for reaching its most critical healthcare goals. The provision of medical care for all will be altered by the amount of available access to resources and technology a country has, and a state’s economic resources will influence how much money is available to spend on healthcare, as well as how many people are able to be served. This may result in a lower standard of healthcare for its citizens; some procedures and basic treatments may be available, but the “highest attainable standard of physical and mental health,” as defined by the World Health Organization, will not be as high as preferred. It may be argued that once a person’s right to appropriate healthcare is at
risk, the universality of that human right is compromised. An acceptable standard of healthcare becomes a privilege possessed only by those who can afford it.

*111 Explaining ISIS’ Methodology to Recruit American Women as Foreign Fighters: An Investigative Analysis
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Media in the United States and indeed around the world work hard to capture their consumers’ attention with reports of terrorism and violence attributed to or claimed by the Islamic State, also known as ISIS. After all, we do have prurient interests.

Much of the available research, past and present, traditionally focuses on men because of the common belief that women hold passive, inherently less interesting roles in extremist groups. This perspective is changing. Women increasingly engage in acts of terrorism and violence. As a result, there is a concomitant increase in the number of publications inside and outside the academic community devoted to the subject.

This research project is about women attracted, recruited, and convinced by ISIS to become foreign fighters. Specifically, this project is a critical, evidence-based investigative analysis of the Islamic State’s methodology used to attract, recruit, and/or convince women, particularly American women, to serve as foreign fighters (once called mercenaries, now more commonly known as “migrants”).

My research and analysis of how and why the Islamic State recruits women, particularly American women, as foreign fighters will contribute to our better understanding an important shortcoming in our body of knowledge regarding terrorism as practiced by militant Islamists. The ultimate goal of my research is to yield clues about how to address and perhaps resolve this sensitive and potentially volatile issue.

*112 Globalization, Ethical Diversity, and the Importance of Integrating Global Bioethics in Healthcare Ethics Education
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We focus on a variety of skills, subjects, and extra-curricular activities at educational institutes, but what we rarely receive is education in ethics. Lack of attention to education in ethics leads to serious implications in a variety of fields. This essay focuses on the global implications in the healthcare sector. Globalization is certainly not new, but with its proliferation, it has made the situation miserable for the vulnerable on a global level, making them susceptible to exploitation. Many bioethical problems today are no longer domestic, but are global bioethical problems. Additionally, there are similarities and differences in ethical values and principles found in the practice of organizations conducting business around the world.
The challenges posed by globalization and ethical diversity can undermine ethical decision making among professionals in transnational practices. Several healthcare organizations have faced devastating effects due to the lack of knowledge and skills in handling these ethical issues. Nevertheless, ethics education is often seen as merely a remedy or a form of restorative justice, but in reality it is a prerequisite and involves continuous reflection. It is important to recognize the ethical challenges, but it is also important to learn to respond to them properly in order to make better ethical decisions.

The need for integrating global bioethics in healthcare ethics education is, therefore, apparent and crucial, as it can cultivate ethical awareness and understanding, develop reasoning and empathic skills that are needed to act ethically, and provide greater motivation to act ethically from a global perspective. Engaging in effective ethics education opportunities in interdisciplinary settings can raise ethical professionals at all levels in the healthcare sector, create organizations that are ethically transformed rather than ethically decoupled, and render optimal patient centered care in all healthcare.
INDEX

Bayer School of Natural & Environmental Sciences
Amery, Liana 25
Benczewicz, Patrick 53
Borga, Natalie 29
Bowman, Ray W. 27
Broderick, Jennifer 30
Goodwin, Olivia 42
Grogan, Christina 39
Hao, Weier 53
Henderson, James 53
Jeganathar Kanmanii, Narthana 56
Lax, Neil 61
*Manley, Linnea 15
McClelland, Sara 63
Miller, Logan 53
Polaski, Anna 69
Pujols, Beatriz 77
Sallmen, Joseph 80
Sethi, Sumedha 82
Shane, Jackie 83
Shiffert, Jessica 84
Sun, Ning 87
Taddeo, Lauren 88
Trevelline, Brian 60
Valkanas, Michelle 91

McAnulty College & Graduate School of Liberal
Atalay, Hande 26
*Chmill, Daniel 3
Coleman, Jamie 33
*Córdoba Montoya, Priscila 4
*Csomay, Bethany 106
*Davenport, Lindsay 104
Deli, Haley 35
Dick, Natalie 5
Fisanick, Alec 37
Horne, Mackenzie 54
*Kanu, Clement 107
*Lukich, Nikolija 110
*Metcaif, Charles 111
*Naumann, Persis 112
Ngijoi-Yogo, Tah 14
*Salwar, Evangel 12
*Siniora, Dina 19
*Smith, Joseph 108
Urban, Brittany 90
VanGorder, Jessica 93
Vargas, Andrew 94
*Verbos, John 109
Wang, Tricia 95
Westerlund, Kelly 103
*Zaremba, Alexandra 23

Mylan School of Pharmacy
Dancsecs, Karly 34
*DeBoyace, Kevin 105
*Dunn, Tyler 6
Florez, Paula 16
Heidari, Elham 52
Herneisey, Michele 7
*Lambert, Eric 9
LIU, LU 16
Liu, Simai 16
Rague, Andrea 78
Solomon, Keren 86
Termine, Jennifer 34
*Wright, Thomas 22

Rangos School of Health Sciences
Brasile, Celeste 28
*Browne, Ashley 2
Casey, Brian 31
Devitt, Megan 36
Diamond, Patrick 38
DiCello, Domenique 40
Dusch, Tim 41
Edmonds, Mike 43
Everett, Corey 44
Fellows, Julia 45
Foley, Elizabeth 49
Fremer, Ashton 46
Fuschner, Kiana 48
Giel, Lauren 101
Gilbert, Jennifer 8
Grasley, Laura 49
Grom, Christine 50
Grunebach, Julia 51
Haggerty, Kristine 47
Hagl, Amanda 11
Hayes, Qwan 18
Hiltz, Rachel 10
Isaac, Kristi 55
Jones, Richard-Tyler 57
Kinney, Joanne 58
Kistner, Rachel 59
Matter, Jacob 62
Matthews, Lauren 58
McGinley, Sally 64
McGovern, Ryan 65
Mead, Katherine 71
Melendez, Alexandra 72
Miller, Alexa 73
Nicol, Molly 74
Oertel, Stephanie 75
Pelini, Michael 76
Peltz, Lauren 68
Peterson, Shelby 67
*Potchak, Carly 97
*Rechner, Gregory 13
Schott, Ryan 81
Sismour, Brittany 85
*Stark, Rebecca 20
*Stettner, Hayley 21
Stone, Hannah 24
Sweetnich, Rachel 41
Vandrak, Julia 92
Wasserman, Talya 96
Wood, Lisa 98
Yesconis, Lydia 99
Zielinski, Erin 100

School of Education
Ahmed, Saddiq 32
Alkhudhayri, Maryam 32
Alkhudhayri, Marwan 32
*Allen, Eva 1
Alshikhi, Omar 32
Chen, Xiaohan 32
Chitiyo, Morgan 32
Drozda, Natalie 70
Fritsch, Rebecca 66, 89
Hilts, Derron 17
Kratsa, Kristi 17
Phillips, Taylor 66
Phillips, Taylor 70
Pugliesi, Krista Lee 70
Tamm, Keenan 66
Tamm, Keenan 89
Tiberi, Amy 70, 89
Tokich, Ashley 70
Zill, Rebecca 102

School of Law
DiVito, Maggie 66
Giglio, Angela 66
Logue, Christy 66

School of Nursing
Rajcan, Lois 79