6th Annual Graduate Research Symposium

Friday, March 15, 2019

Charles J. Dougherty Ballroom
Power Center, Duquesne University

SPONSORED BY
Office of Research and Office of the Provost

Artwork by Carissa Kotyuha
The 6th Annual

GRADUATE STUDENT Research Symposium

March 15, 2019
Charles J Dougherty Ballroom
Duquesne University
<table>
<thead>
<tr>
<th>Acknowledgements</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule</td>
<td>4</td>
</tr>
<tr>
<td>Oral Presentations</td>
<td>5</td>
</tr>
<tr>
<td>Awards</td>
<td>8</td>
</tr>
<tr>
<td>Abstracts</td>
<td>10</td>
</tr>
<tr>
<td>Index by School</td>
<td>80</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

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 Faith & Culture
- Center for Community-Engaged Teaching & Research
- Center for Healthcare Ethics
- Gumberg Library
- Enrollment Management Group
- McAnulty College and Graduate School of Liberal Art
- School of Nursing
- Office of the Provost
- Office of Research, Christine Pollock & Mary McConnell-Krepps
- Rangos School of Health Sciences
- Peer Selection Committee

**Co-Chair:** Zachary Dehm (Theology) **Co-Chair:** Sara McClelland (Biology), Tell Lovelace (Chemistry), Kayce Tomcho (Chemistry), Eric Lambert (Pharmacy), Brandon Hoenig (Biology), Lindsay Carroll (Physical Therapy), Mordechai Barron (Special Education), Angela Gallagher (History), Mihiri Meepegama (Instructional Technology)
## SCHEDULE

### Thursday, March 14, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>9:30 a.m. to 2:00 p.m.</td>
<td>Participant Set up</td>
</tr>
<tr>
<td>2:00 p.m. to 4:00 p.m.</td>
<td>Reception for Students &amp; Judges</td>
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### Friday, March 15, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:30 a.m. to 9:00 a.m.</td>
<td>Welcome</td>
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<tr>
<td>9:00 a.m. to 10:00 a.m.</td>
<td>Oral Presentation Session 1</td>
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<td>Concurrent Sessions – Section A &amp; Section B</td>
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<td></td>
<td>Poster Session is closed at this time</td>
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<tr>
<td>10:00 a.m. to 11:00 a.m.</td>
<td>Poster Session – Power Center Section C &amp; Shepperson Suite</td>
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<tr>
<td>11:00 a.m. to 12:00 p.m.</td>
<td>Oral Presentation Session 2</td>
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<td>Concurrent Sessions – Section A &amp; Section B</td>
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<tr>
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<td>Poster Session is closed at this time</td>
</tr>
<tr>
<td>12:00 p.m. to 1:00 p.m.</td>
<td>Poster Session – Power Center Section C and Shepperson Suite</td>
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<td></td>
<td>Boxed lunches provided for participants</td>
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<tr>
<td>1:00 p.m. to 2:00 p.m.</td>
<td>Oral Presentation Session 3</td>
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<td>Concurrent Sessions – Section A &amp; Section B</td>
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<td>Poster Session is closed at this time</td>
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<tr>
<td>2:00 p.m. to 3:00 p.m.</td>
<td>Poster Session – Power Center Section C and Shepperson Suite</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>Awards and Closing Remarks</td>
</tr>
</tbody>
</table>
## ORAL PRESENTATIONS – SESSION 1

<table>
<thead>
<tr>
<th>SECTION A</th>
<th>Moderator: Harley Bobnar</th>
<th>SECTION B</th>
<th>Moderator: Odeese Khalil</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Samantha Duhe</td>
<td>9:00</td>
<td>Madeleine Wood</td>
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<tr>
<td></td>
<td>Musicianship</td>
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<td>Forensic Science &amp; Law Program</td>
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<tr>
<td></td>
<td>Mary Pappert School of Music</td>
<td></td>
<td>Bayer School of Natural and Environmental Sciences</td>
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<tr>
<td></td>
<td>Faculty Advisor: Benjamin Binder, Ph.D.</td>
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<td>Faculty Advisor: Michael Van Stipdonk, Ph.D.</td>
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<tr>
<td></td>
<td>Abstract: 136</td>
<td></td>
<td>Abstract: 40</td>
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<tr>
<td></td>
<td><em>The Poetic Horn: Rethinking expressive intent in Schumann’s Adagio und Allegro</em></td>
<td></td>
<td><em>Detection and Identification of Model Peroxide Explosives Using Paper Spray Ionization Combined With Tandem Mass Spectrometry</em></td>
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<tr>
<td>9:15</td>
<td>Besem Etchi</td>
<td>9:15</td>
<td>Hillary Villarreal</td>
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<tr>
<td></td>
<td>Theology</td>
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<td>Center for Healthcare Ethics</td>
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<td>McAnulty College and Graduate School of Liberal Arts</td>
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<td>McAnulty College and Graduate School of Liberal Arts</td>
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<tr>
<td></td>
<td>Faculty Advisor: Elizabeth Cochran, Ph.D.</td>
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<td>Faculty Advisor: Gerard Magill, Ph.D.</td>
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<tr>
<td></td>
<td>Abstract: 135</td>
<td></td>
<td>Abstract: 111</td>
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<tr>
<td></td>
<td><em>“Returning to My Father”: A Decolonial Reading of Lk 15:11-32 Towards a Reconstruction of African Theological Anthropology for Authentic Sacramental Ethics via Indigenous Divinity Graduate Schools</em></td>
<td></td>
<td><em>The Ethical Implications of Using Living Kidney Donation to Address the Kidney Shortage</em></td>
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<tr>
<td>9:30</td>
<td>Jennifer Stephen</td>
<td>9:30</td>
<td>Brielle Corrente</td>
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<tr>
<td></td>
<td>Nursing</td>
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<td>Physician Assistant</td>
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<td></td>
<td>School of Nursing</td>
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<td>Rangos School of Health Sciences</td>
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<tr>
<td></td>
<td>Faculty Advisor: Rick Zoucha, Ph.D.</td>
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<td>Faculty Advisor: Brenda Swanson-Biearman, DNP, MPH, RN</td>
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<tr>
<td></td>
<td>Abstract: 112</td>
<td></td>
<td>Abstract: 19</td>
</tr>
<tr>
<td></td>
<td><em>The Feasibility of a Mini-Study Using Ethnonursing Methodology to Understand the Experiences, Values, and Beliefs of Spanish Speaking Parents Whose Children Are Hospitalized</em></td>
<td></td>
<td><em>Aortoduodenal Fistula Forms From Primary Aortic Stump Graft in a Two-Time Multi-Visceral Transplant Patient with Presentation of Gastrointestinal Bleed and Bowel Perforation: A Case Report</em></td>
</tr>
<tr>
<td>9:45</td>
<td>Sophia Vayansky</td>
<td>9:45</td>
<td>Adele Flaherty</td>
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<tr>
<td></td>
<td>History</td>
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<td>Center for Healthcare Ethics</td>
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<td>McAnulty College and Graduate School of Liberal Arts</td>
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<td>Faculty Advisor: John Mitcham, Ph.D.</td>
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<td>Faculty Advisor: Henk ten Have, PhD, MD</td>
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<td></td>
<td>Abstract: 126</td>
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<td>Abstract: 134</td>
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<td></td>
<td><em>Back on the Map: Digitally Mapping Native American Presence in Pennsylvania and the Middle Colonies</em></td>
<td></td>
<td><em>Unintended Consequences: The Treatment of Chronic Pain as a Global Bioethical Issue</em></td>
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</tbody>
</table>
### ORAL PRESENTATIONS – SESSION 2

#### SECTION A | Moderator: Michelle Valkanas

<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Department &amp; School</th>
<th>Faculty Advisor:</th>
<th>Abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00</td>
<td>Emma-Rae Ranger</td>
<td>Forensic Science and Law</td>
<td>Micheal Van Stipdonk, Ph.D</td>
<td>Development of a Metal Ion Extraction Protocol for GSR in Blood Matrices with Analysis on SEM-EDX</td>
</tr>
<tr>
<td>11:15</td>
<td>Kandarp Dave</td>
<td>Pharmaceutics</td>
<td>Devika Manickam, Ph.D</td>
<td>Screening and in vitro transfection parameter optimization of BDNF siRNA loaded lipidoid-nanoparticles for the treatment of chronic neuropathic pain</td>
</tr>
<tr>
<td>11:30</td>
<td>Megan Crutcher</td>
<td>History</td>
<td>Alima Bucciantini, Ph.D</td>
<td>Engaging Visitors with Conservation: The Key to Museum Sustainability</td>
</tr>
<tr>
<td>11:45</td>
<td>Diana Delgadillo</td>
<td>Biology</td>
<td>Becky Morrow, Ph.D</td>
<td>Feline Infectious Keratitis Leading to Eye Rupture - Molecular Determination of Possible Pathogens</td>
</tr>
</tbody>
</table>

#### SECTION B | Moderator: Kate Abram

<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Department &amp; School</th>
<th>Faculty Advisor:</th>
<th>Abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00</td>
<td>Asmat Islam</td>
<td>Center for Healthcare Ethics</td>
<td>Gerard Magill, Ph.D</td>
<td>Moral Obligation of Buying the Best Baby: Revisiting Arguments for Non-Medical Sex Selection in Global Commercial Surrogacy</td>
</tr>
<tr>
<td>11:15</td>
<td>Michele Herneisey</td>
<td>Pharmaceutics</td>
<td>Jelena Janjic, Ph.D</td>
<td>Resveratrol loaded nanoemulsions and microemulsions designed as safe, natural alternatives to opioids for the treatment of surgically induced chronic pain</td>
</tr>
<tr>
<td>11:30</td>
<td>Chelsea Abdullah</td>
<td>English</td>
<td>James Purdy, Ph.D</td>
<td>The Liar’s Gambit: An Online, Collaborative Novel</td>
</tr>
<tr>
<td>11:45</td>
<td>Bethany Kaser</td>
<td>English</td>
<td>Laura Engel, Ph.D</td>
<td>&quot;Dolls to Duchesses: The Doll’s Influence on Queen Victoria's Monarchy&quot;</td>
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</table>
## ORAL PRESENTATIONS – SESSION 3

### SECTION A
Moderator: Narthana Jeganathar Kanmanii

<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Major/Program</th>
<th>College/Program</th>
<th>Advisor</th>
<th>Abstract</th>
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<tbody>
<tr>
<td>1:00</td>
<td>Michelle Valkanas</td>
<td>Biological Sciences</td>
<td>Bayer School of Natural and Environmental Sciences</td>
<td>Nancy Trun, Ph.D.</td>
<td>132</td>
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<td>Do Bacteria Effect the Efficiency of Abandoned Mine Drainage Passive Remediation Systems?</td>
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<tr>
<td>1:15</td>
<td>Autumn Marie Chilcote</td>
<td>Psychology</td>
<td>McAnulty College and Graduate School of Liberal Arts</td>
<td>Alexander Kranjec, Ph.D.</td>
<td>76</td>
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<tr>
<td></td>
<td>Without Words: Relational Neuropsychology and Creative Arts Therapies with People Managing Aphasia</td>
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<tr>
<td>1:30</td>
<td>Emmanuel Abbeye-Quaye</td>
<td>Theology</td>
<td>McAnulty College and Graduate School of Liberal Arts</td>
<td>Daniel Scheid, Ph.D.</td>
<td>138</td>
</tr>
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<td></td>
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<td></td>
<td>The Role Of Religious Leaders In Countering Religious Extremism And Violence In Africa</td>
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<tr>
<td>1:45</td>
<td>Suyang Wu</td>
<td>Pharmaceutics</td>
<td>School of Pharmacy and the Graduate School of Pharmaceutical Sciences</td>
<td>Carl Anderson, PhD</td>
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<td>Accelerated Cell Line Serum-Free/Suspension Adaptation with Culture Medium Improvement using Definitively Screening Design</td>
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### SECTION B
Moderator: Kayla Acklin

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<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Major/Program</th>
<th>College/Program</th>
<th>Advisor</th>
<th>Abstract</th>
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<tbody>
<tr>
<td>1:00</td>
<td>McKenna Lohr</td>
<td>Forensic Science and Law Program</td>
<td>Bayer School of Natural and Environmental Sciences</td>
<td>Lisa Ludvico, Ph.D.</td>
<td>107</td>
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<tr>
<td></td>
<td>The Comparison of MtDNA Control Region Haplotypes between Individuals of Known Maternal Lineage and Ancient Skeletal Remains from the Flevaeis Plot Archaeological Site in Rhodes</td>
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<tr>
<td>1:15</td>
<td>Kurt Halligan</td>
<td>Department of History</td>
<td>McAnulty College and Graduate School of Liberal Arts</td>
<td>Andrew Simpson, Ph.D.</td>
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<td>Chemical Chaos in World War I: United States Failure and Success in Responding to the Poison Gas Threat in Europe.</td>
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<tr>
<td>1:30</td>
<td>Mohammed Aljaffal</td>
<td>Special education</td>
<td>School of Education</td>
<td>Temple S. Lovelace, Ph.D., BCBA-D Lovelace, Ph.D.</td>
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<td></td>
<td>The Attitudes Of Secondary School Teachers Regarding Inclusion Of Students With Autism In Saudi Arabia</td>
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<tr>
<td>1:45</td>
<td>Paul Weinbaum</td>
<td>History</td>
<td>McAnulty College and Graduate School of Liberal Arts</td>
<td>John Mitcham, Ph.D.</td>
<td>47</td>
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BAYER SCHOOL FOR NATURAL AND ENVIRONMENTAL SCIENCES  
Award for Graduate Research-Excellence in Graduate Research: Two awards, $300 each  
Students whose projects fall within the realm of the basic sciences are considered for this award. Projects are evaluated based upon organization, creativity, clarity, and technical content.

CENTER FOR AFRICAN STUDIES  
Award for Graduate Student Research in African Studies: $400  
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.

Award for Graduate Student Research in Global Health: $400  
This award is intended to encourage and reward graduate research in Global Studies. Evaluations are based upon visual presentation, organization, creativity, and clarity.

CENTER FOR CATHOLIC FAITH & CULTURE  
Common Good Research Award: $500  
The Centers recognize and reward research from any discipline that aligns with Duquesne's Catholic, Spiritan mission, particularly our commitments to: the dignity and equality of all persons, working with vulnerable populations for systemic change, and preserving justice, peace, and integrity of creation.

CENTER FOR COMMUNITY-ENGAGED TEACHING & RESEARCH  
CETR Award for Graduate Research: $250  
The aim of this award is to recognize and celebrate research that contributes to authentic partnerships between scholars and community that generates knowledge that is relevant to disciplinary discovery as well as application to community concerns. The award will include a prize of $250 as well as a gift to the researcher’s community partner.

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 price 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: $500
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.

Oral History Initiative Award for Graduate Research: $300
The Oral History Initiative Award for Graduate Research rewards research methods that demonstrate excellence in the application of oral history resources and methodology. Exceptional projects in any field of study that incorporate significant use of original or archival oral history resources or collections are eligible.

MARY PAPPERT SCHOOL OF MUSIC
Mary Pappert School of Music Graduate Award: $250
The aim of this award is to recognize excellence in Music.

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.

OFFICE OF THE PROVOST
Provost’s Award for Outstanding Scholarship, 3 awards, $150 each
Students from all disciplines who are participating in the GSRS are 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.

SCHOOL OF NURSING
Award for Graduate Research: $250
Student from the School of Nursing are considered for this award.
1 Cholangitis, Liver Abscesses, and Acute Pancreatitis Associated with Hameophilus parainfluenza: A Case Report
Trong Do
Physician Assistant | Rangos School of Health Sciences
Faculty Advisor: Brenda Swanson-Biearman, DNP, MPH, RN

Cholangitis is a well known biliary tree infection. The condition is typically caused by the obstruction of a stone in the bile duct which leads to infection. The classic symptomatic triad is fever, abdominal pain, and jaundice. Along with these symptoms, many complications may accompany the condition. Typically, the infection is caused by gram negative bacteria or anaerobes, in particular Escherichia coli. In this case, an 85 year old female presents with cholangitis and the complications of liver abscesses, acute pancreatitis, and polymicrobial bacteremia. Cultures revealed that the infection was caused by Hameophilus parainfluenza and Streptococcus viridans. The combination of these two organisms are unusual, and in particular the presence of H. parainfluenza is extremely rare. The patient was treated with ceftriaxone, and the infection resolved. There is limited literature concerning this organism's relationship to cholangitis and suggests that further research must be done on its etiology.

2 An Examination of Nickel Catalyzed Reactions of Propargyl Compounds with Soft Nucleophiles
Sarah Hejnosz
Chemistry and Biochemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Thomas Montgomery, Ph.D
Additional Authors: Marianne Hanna, Paige Aley, Thomas Montgomery

There is growing interest in transition metal catalysis to remedy the over utilization of precious second and third row transition metals by investigating the far more sustainable and naturally abundant first row transition metals. We are particularly interested in looking into how palladium, a precious metal, can be replaced with nickel, its first row counterpart. This research examines allene formation via nickel catalyzed reactions of propargyl systems, a field dominated by palladium catalysis. Allenes are high value products, particularly in the medicinal chemistry community as they play key roles in the biological activity of many natural products. Specifically, the reactions of in-situ formed metallo-allenes, with various nucleophilic compounds will be studied. Overall, this research will aid in exploring chemical reactions catalyzed by earth abundant nickel and determining their relationships to their palladium counterparts.

*3 The Attitudes of Secondary School Teachers Regarding Inclusion of Students With Autism in Saudi Arabia
Mohammed Aljaffal
Special education | School of Education
The purpose of this study was to examine secondary school teachers' attitudes regarding the inclusion of students with autism spectrum disorders (ASD) in Riyadh, Saudi Arabia. In Saudi Arabia, students with ASD can attend regular education classrooms, especially in elementary and middle schools. In addition, the Ministry of Education in Saudi Arabia is interested in the implementation of the inclusion of students with ASD at secondary schools. Since the attitudes of secondary school teachers toward inclusion of students with ASD have not been examined, it was important to look at the attitudes of these teachers regarding the inclusion of students with ASD so that the inclusion of students with ASD is implemented successfully. Research questions that guided this study were: "What are the attitudes of secondary school teachers toward inclusion of students with autism in general education classrooms?"; "What placement options do secondary school teachers think are appropriate for educating students with ASD?"; and Do secondary school teachers' attitudes toward inclusion of students with autism differ based upon variables such as years of teaching experience, gender, level of education, and type of school? Over 2000 secondary school teachers completed an online survey. The results of the study indicated that secondary school teachers in Riyadh had slightly positive attitudes toward inclusion of students with ASD. Furthermore, a majority of teachers participating in this study indicated that the placement of students with ASD should be determined based on the severity of symptoms. In addition, statistically significant differences were found between the attitudes of secondary school teachers and the following variables: years of teaching experience, gender, level of education, and type of school. More details regarding the results of this study are contained in Chapter 4. Furthermore, secondary school teachers' implications are discussed. Limitations of the research and future research questions are provided.

4 "Puff of Smoke": An Atypical Presentation of Moyamoya Disease
Alexxis Langton
Physician Assistant Department | Rangos School of Health Sciences
Faculty Advisor: Kristin D'Acunto, MPA, PA-C

Moyamoya disease (MMD) is a rare, progressive cerebrovascular disorder that is most commonly found in the Asian race. This disease involves steno-occlusion of arteries within the circle of Willis as well as the development of abnormal collateral vessels at the base of the brain. These collateral vessels resemble a "puff of smoke" on imaging. The typical presentation of MMD includes stroke, TIA, seizures, headache, and cognitive impairment. We present a case of a 35 year-old white female, with a past medial history of type 2 diabetes, who presented in a catatonic state after experiencing a syncopal episode. After one hour, the patient was back to her baseline status and the catatonic state was completely resolved. Since the typical presentation of MMD does not generally include catatonia, it is unusual for a patient with MMD to present with this manifestation. Based on her history and physical exam, an acute stroke and MMD were not suspected. However, CT/CTA of the head ruled out an acute stroke, but CTA of the head/neck confirmed MMD due to the occlusion of the right middle cerebral artery and presence of a collateral vascular supply. Our patient was discharged two days later on 81 mg of aspirin that was to be continued until her neurologic follow-up appointment for consideration of revascularization.
Multiple primary lung cancer (MPLC), having a minimum of two histologically different types of lung masses, is divided into two subtypes. Synchronous MPLC and metachronous MPLC are differentiated by the timing of the emergence of the second mass. The diagnosis of MPLC is important in guiding the treatment for these patients because MPLC is treated differently than other lung cancers. There are no established treatment guidelines, but research has shown resection or individualized chemotherapy to have promising results. We present a case of a 66-year-old female being treated with radiation therapy for squamous cell lung cancer over the past year. A recent CT of the chest incidentally showed growth in the right upper lobe mass in comparison to prior studies. A repeat bronchoscopy with biopsy revealed synchronous small cell lung cancer in the right upper lobe. The patient was then referred to oncology for adjustments to her treatment plan.

Adenovirus is a common respiratory and gastrointestinal virus in children, but its manifestations in the central nervous system are uncommon. Isolated central nervous system involvement caused by adenovirus is very rare. This presentation is a 16-year-old with encephalitis with no prior respiratory, gastrointestinal, or conjunctival illness. Encephalitis, or inflammation of the brain, is commonly viral in origin and caused by viruses such as herpes simplex virus, varicella zoster, coxsackievirus, enterovirus, influenza, and Epstein Barr virus but not adenovirus. This patient had no past medical history prior to waking up with a headache, blindness, and altered mental status. Adenovirus was cultured from his cerebrospinal fluid and respiratory tract secretions and changes consistent with encephalitis were seen on his MRI of his brain. All other common causes of encephalitis were excluded leading to the conclusion that this was a rare case of adenovirus encephalitis. The patient suffered significant neurologic damage from the infection proving that adenovirus in the central nervous system can be very serious. Only a few cases adenovirus causing encephalitis in immunocompetent children have been reported. This case provides evidence that adenovirus should be considered as a cause of encephalitis once the common causes are excluded, even if no prior symptoms of adenovirus infection were exhibited.

West Nile Virus (WNV) is flavavirus transmitted to humans via mosquito bites. Approximately 80% of the time infected people are asymptomatic. However, 1 out of every 150 infected people will develop a
neuroinvasive form of the disease. This can manifest as meningitis or encephalitis. There are multiple risk factors for developing a more severe, neuroinvasive form of the disease such as immunocompromised states, age, history of alcohol abuse and male gender. WNV was first introduced to the United States in 1999, but the incidence of neuroinvasive WNV in Western PA has remained low. The mortality of neuroinvasive WNV is 15% in the United States. This is a case of a 77 year-old male with a recent history of camping in Western, PA who developed encephalitis due to WNV. Because there is no treatment for this viral illness, he was given supportive treatment as his condition began to deteriorate, and he progressed into respiratory failure.

8 A Systematic Literature Review of Patient Reported Outcome Measures in Shared Decision Making for Parkinson's Disease
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Background: Parkinson's disease (PD) is a progressive CNS disorder resulting in altered nerve cell function. Patients with PD experience cognitive and physical difficulties which negatively affect patients' quality of life and their ability to make decisions. Shared Decision Making (SDM) through the use of patient reported outcomes (PROs) measures helps bridge the gap between patient preferences and treatment decisions.

Objective: To conduct a systematic review to assess the use of PROs in SDM in the treatment of patients with PD.

Methods: Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), PubMed, PsycINFO and CINAHL databases were used to identify English language articles published till October 2018. The search strategy utilized search terms (alone or in combination) related to PD, SDM and PROs. Review articles, theses/dissertations, conference abstracts, commentaries, editorials or summary reports were excluded from the study.

Results: A total of six articles were included in the qualitative synthesis. Study objective, patient population, setting, description of the PRO measures, method of PRO administration, and key findings were extracted from the studies. PRO measures such as PDQ-39, MacCAT-T, and those comprising of discrete choice experiments were used to measure patients' quality of life, medical decision making and willingness to accept tradeoffs among various PD-related treatment attributes. Majority of the PROs were administered as surveys using mail, telephone or the internet. The studies showed that patients with PD benefited from their engagement in the treatment decisions. Being involved in the decision-making process was also associated with improvement in patient's well-being and overall satisfaction.

Conclusion: Although there were limited number of studies evaluating the use of PROs in SDM in the PD population, the results demonstrate the importance of generating valuable information that can inform the patients of their treatment choices. There is a need to seamlessly integrate PRO assessment in the clinical practice.

9 Well Child Care in a Patient with a COL2A1 Gene Mutation
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COL2A1 gene mutations affect type II collagen that is present in multiple organ systems. Each patient affected by COL2A1 presents differently based on the defects in the type II collagen; however, the condition has nine major phenotypes. Caring for these patients can be difficult as initially the magnitude of the effects is often unknown, and the condition itself is impossible to diagnose without a genetic analysis. Primary care providers must quickly refer patients with abnormal signs and symptoms at birth to a genetic specialist quickly to ensure proper diagnosis and timely treatment of signs and symptoms associated with the mutation. This case focuses on the well child care of a 10 month-old-male with a COL2A1 genetic mutation as well as a Pierre Robin Sequence, with an associated non-contributory genetic mutation. Patients with similar diagnosis will require close monitoring and individualized care. Providers must take their mutations into special consideration when conducting routine care as it will include skeletal surveys, as well as detailed history, to ensure proper follow up with subspecialties tailored to the patient’s symptoms and needs.

In biopharmaceutical industry, suspension cell culture is commonly preferred due to higher cell density and productivity. To successfully culture the anchorage-dependent mammalian cells in suspension, cells need to be adapted to serum depleted culture medium. However, this process is time-consuming and largely based on trial-and-error. An adaptation study was performed on Chinese Hamster Ovarian (CHO) cell (DP-12), using the gradual serum reduction approach. This study revealed medium composition was critical to the adaptation process, in comparison to the number of repetitive passages performed at each serum level. Additionally, medium composition improvement prevented undesired clone selection caused by major death events. The medium composition improvement was efficiently performed with rational Design of Experiment (DOE), which eventually accelerated adaptation. In total, the adaptation process took as short as 22 days. The adaptation process in this study was divided into two stages: adherence-culture stage and suspension culture stage. At the adherence-culture stage (7.5% and 5% serum), each passage took up to 9 days to reach 90% confluence, and minimal improvement was observed on the growth rate even after five consecutive passages. But this duration shrank to 3 days if the calcium and magnesium ion concentration increased to 2.27mM and 1.08mM respectively. This enhancement significantly reduced the time required for adaptation process. At the suspension culture stage, (serum level lower than 2.5%), the CHO cells could be cultured in suspension at the serum level of 2.5% and 1%. However, cells failed to grow consistently when the serum level reduced to 0.5%. A definitive screening design was conducted to select the essential nutrients facilitating suspension adaptation. Independent validation batch were performed and their result aligned well with the prediction. Cells were readily adapted to the optimized media determined by DOE result.
Acculturation Behavior Among the Syrian Refugee Youths in the United States
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Acculturation has a significant influence on the youths' psychological wellbeing, educational needs, and social adaptation. The purpose of this study is to highlight the acculturation behavior among the Syrian youths, who resettled in the United States after the Syrian refugees' crisis. This study focuses on the lived experience of Syrian youths coming from a different culture to another, and what challenges the youths might have. The lived experience phenomenal approach was utilized in this study to gain a deeper understanding of the Syrian youths lived experiences. Few studies have focused on the Syrian refugee youths acculturating in the US. There are several considerations that the youths need to acculturate in their new home.

Accuracy of text-to-speech assistive technology
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Text-to-speech assistive technology (AT) applications, which use a synthesized voice to read text aloud, are frequently used classroom aids to accommodate for reading problems, and in turn promote effective reading comprehension(1,2). Studies have evaluated the efficacy of text-to-speech AT across students with learning(3), emotional(1), and other chronic disabilities(4-6). These studies suggest that AT is more effective for some students than others, and that use of AT may not normalize academic performance. One reason for this may be that text-to-speech AT does not read text aloud as accurately as one might expect. This study will explore how accurately three commonly employed text-to-speech applications decode words. The accuracy of AT has serious implications regarding treatment integrity of interventions, as well as methodological implications for AT research.

Method: This study will measure the accuracy of text-to-speech applications using a 2nd generation iPad and three text-to-speech applications found in the app store (e.g., Voice Dream, Speechify, and Natural Read). A researcher trained in curriculum-based measurement (CBM) techniques will listen to and score three, grade 4, 5, 6, 7, 8, and 9 reading passages from the Timed Readings in Literature series (Spargo, 1989). Each passage contains 400 words and the percentage of words correctly read will be obtained. Standard CBM rules (e.g., AIMSweb R-CBM) will be used to identify misread words. A second researcher will perform a treatment integrity check on 20% of the reading passages, and inter-scorer agreement will be reported. Commonly misread words will be reported, and patterns of miscued words across applications will be identified.

Discussion: Implications of the findings for the use of text-to-speech assistive technologies, what accuracy we might expect of them, methodological implications, limitations, and future directions of inquire will be further discussed.

References:
Adult idiopathic hypertrophic pyloric stenosis has less than 300 documented cases. It commonly manifests itself with generalized abdominal pain, early satiety, and nausea. Established risk factors include nonsteroidal anti-inflammatory drug use, peptic ulcer disease, and smoking. It is not normally diagnosed via radiographic imaging but is diagnosed during an esophagastroduodenoscopy or surgery. We present a case of a 68-year-old white female who presented to the surgical clinic with a main complaint of abdominal pain. A mass was discovered at her pylorus during an EGD scope, and an exploratory laparotomy was scheduled. The patient underwent a subtotal gastrectomy at which point she was diagnosed with hypertrophic pyloric stenosis. Her pathology report also confirmed this. Upon follow up, the patient's symptoms had improved without any complications.

Border issues plague history as a transnational concern as societies transition from the governed to governing. Societies, sovereign nations, and cultural centers obsess over physical and imaginary lines separating ours from theirs. In my paper, I analyze how different people from the US and Mexico viewed 'security' during the Pancho Villa Raid and Punitive Expedition from 1916 to 1917. Government officials, military leaders, and border citizens interpreted 'security' differently during the raid and expedition, which defined tensions between the governments, the people, and the cultures of both nations.

This argument introduces the topic of human agency to border conflicts and presents a transnational theme across borders: humans, and their actions, matter. It also deconstructs the concept of fear and how fear is weaponized to separate groups of people. The use of local and national newspapers, the personal papers from military officers like General John Pershing and Lieutenant George Patton, and diplomatic correspondence from the Foreign Relations of the United States collection contribute compelling evidence that supports my argument.
The diplomatic, transnational, and border history presented in my paper serves as a case study for research in border security and border studies. My work contributes to the literature because I use existing source material to present a local, regional, and national history that resonates in the twenty-first century. My paper transcends American border regions as the issues of human agency, security, and use of fear influence border relations globally.

15 An Atypical Presentation of Myasthenia Gravis
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Myasthenia gravis is an autoimmune disorder affecting the neuromuscular junction. Typically, patients affected by this disorder present with generalized weakness and fatigue. Majority of patients with myasthenia gravis are seropositive, meaning that they have antibodies attacking the acetylcholine receptors at the neuromuscular junction. However, there is a small percentage of patients that are seronegative for these antibodies. Instead, they have antibodies that attack the muscle specific tyrosine kinase glycoprotein. This subtype is more common in women, and typically presents with oculobulbar symptoms. We present a case of a 28-year old otherwise healthy female, with complaints of a two month history of dysphagia to liquids and solids. She developed progressive weakness on admission which prompted screening for an underlying neuromuscular cause of her symptoms. The results were positive for antibodies to the muscle specific tyrosine kinase glycoprotein, attributing to her atypical presentation of myasthenia gravis.

16 Analysis of Blood Spatter on Stain Resistant and Non-Stain Resistant Interior Paints
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The purpose of this research was to determine if there was a difference in the size and shape of impact bloodstains on interior walls painted with stain resistant paints and non-stain resistant paints. Due to the vast number of interior paints available today it is important to determine if the type of paint needs to be considered when analyzing a crime scene. Five stain resistant paints and five non-stain resistant paints on primed drywall samples were tested using a rat-trap to simulate a reproducible impact spatter. Five replicate blood spatter samples were created for each of the different paint types. Then five representative stains were chosen from varying areas on each sample. The length and width of the representative stains were measured and the area of ellipse was calculated. The results indicate a negligible difference between the stain resistant and non-stain resistant paints. This research demonstrates that the type of interior paint on walls has minimal effect on blood spatter analysis.

17 Anti-colonialism and Eisenhower's Foreign Policy
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The Eisenhower Administration's active participation in the Iranian coup of 1953 can be viewed as a
dichotomous moment in Eisenhower's foreign policy approach. Eisenhower held strong views against colonialism, and as the newly elected president, he entered office with significant international issues that required his focused attention.

As the leader of the free world, he would be expected to support other western nations as they dealt with various cold war international events. However, support from the United States would not be provided under this administration, if linked to colonialism. Eisenhower was very critical of both Britain and France for their colonial past and its impact on other developing nations and regions of the world.

The Iranian coup was a contradiction of his anti-colonialism views. The importance of this stance is significant when put in the context of his actions later as President, such as when he declined to support the French at Dien Bien Phu. Why was there a departure in policy by Eisenhower after the coup? Why did he sacrifice his anti-colonialism beliefs in support of Britain during the coup? Was the real nexus the safeguarding and support of the developing global oil economy? Or was it the threat of communist expansion into the Middle East?

Understanding how Eisenhower's anti-colonialism impacted his foreign policy decisions, and the actions taken during the coup, will provide a unique perspective to the existing literature on Eisenhower's approach to foreign policy during his administration.

18 Antifungal properties of salamander skin secretions vary and may protect some species from chytrid pathogens linked to worldwide amphibian decline.
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Amphibian skin is unique among vertebrate classes, containing a large number of multicellular exocrine glands. The secretions of these glands include a repertoire of bioactive compounds including antimicrobial peptides (AMPs) which are important for protecting individuals from infectious disease such as chytridiomycosis. Chytridiomycosis is a lethal skin disease linked to amphibian population declines worldwide and is caused by chytrid fungi, Batrachochytrium dendrobatidis (Bd) and B. salamandrivorans (Bsal). Susceptibility to chytrid fungi is species-specific and has been related to AMP bioactivity. In frogs, AMP bioactivity against Bd has been measured for numerous taxa using in-vitro assays. Similar studies are lacking for salamanders and the recently discovered chytrid fungus, Bsal. Our objective was to test whether the skin secretions of salamanders exhibit AMP bioactivity against chytrid fungi. Because the infective stage (zoospores) of Bd and Bsal are similar in ultrastructure, we predicted that skin secretions effective against Bd would also be effective against Bsal. We used solid phase extraction to concentrate peptides from the skin secretions of several native salamander species, combined the collected peptides with Bd or Bsal zoospores in a 96-well plate, and assessed the antifungal properties for each species' skin secretions by measuring changes in optical density over a seven day period. We found evidence of AMP bioactivity in the skin secretions of some but not all salamander species. In addition, variation in the effectiveness of skin secretions to inhibit fungal growth was also observed. Lastly, the skin secretions of some salamander species were effective at limiting the growth of both Bd and Bsal, while the skin secretions of other species only limited the growth of Bd or Bsal.
Aortoduodenal Fistula Forms From Primary Aortic Stump Graft in a Two-Time Multi-Visceral Transplant Patient with Presentation of Gastrointestinal Bleed and Bowel Perforation: A Case Report

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Usually not diagnosed until open laparotomy, aortoduodenal fistulas (ADF) are one of the most rare complications of intestinal transplant surgery. With an incidence rate of only 0.04% at autopsy and only 250 documented cases since the early 1800’s, aortoduodenal fistulas are the most deadly complications of intestinal transplantation with a mortality rate of 100% without surgical intervention. In the case presented, a 39 year old, two-time multi-visceral transplant African American female suffers from a primary aortoduodenal fistula formation in a primary modified multi-visceral transplant aortic stump graft site. With emergency open laparotomy repair, revascularization of the secondary multi-visceral transplant was done, saving the life of the patient and preserving the current multi-visceral transplant. Due to the rising number of intestinal transplants and multi-visceral transplants preformed, clinicians should always have high suspicion of aortoduodenal fistulas in any transplant patient that presents with acute abdominal pain and lower gastrointestinal bleeding. With quick diagnosis survival rate of aortoduodenal fistulas in multi-visceral transplant patients may improve.

Are We Diluting History?

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Historical markers are everywhere and therefore have the potential to transmit history to a wide range of audiences. But is the history they are promoting always "valid" history? Through this research project, I hope to show trends in the validity of historical markers, how time has had an effect on the historical significance of markers, and how they correlate to the median income of the areas where they are erected.

This research project will use the Ohio Historical Marker program for its case study. I will use a random sampling of 20-25% of the markers (approximately 300) and test them on a grading rubric as objectively as possible. The markers will be judged on four categories with the opportunity to score up to ten points per section. The four categories are:

(1) Historical significance (broken down on a local, state, and national level)
(2) The lasting integrity of the historical importance
(3) The context of the marker, its text, and its location
(4) The mechanics of the marker (grammar, skilled and complete writing, correctly numbered, etc.)

The data from this case study will then be gathered and examined. The rated historic validation of the markers will be compared by the dates the markers were erected and the median household income of the township. This will show that Ohio Historical Markers have declined in historical significance over time, and the least historically significant markers are found in areas with higher median incomes. These trends can cause historically significant markers to appear diluted, and are most likely due to the broad
requirements to obtain a marker, the judgement of the applications, and the purchasing of markers to increase property value.

21 As the Phoenix Rises, so Does Millvale: How an Aging Pittsburgh Borough Revitalizes Itself
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Millvale, Pennsylvania is a small borough outside of Pittsburgh. While not as well-known as the big city, this small community can boast some interesting spots, including old churches and iconic art. The successes and failures of this community start with a rich history of industrialization and immigration, which culminates in fine examples of arts and culture. Mr. Smalls Theatre, an old church-turned concert venue, is the most recent example of the latter and evidence of a strong younger community. Present-day Millvale is undergoing drastic changes to its demography, with many young people taking advantage of cheap housing to create a multi-class, multi-generational cohesive community. Many local businesses and attractions also draw residents in, including the famous Maxo Vanka murals, which are the major tourist destination in the borough. Through all these shifts, Millvale still retains its small-town aura while also encouraging younger people to move in, a difficult task for older, aging boroughs. For this, affordability and emphasis on local businesses/attractions are a priority, as Millvale has made it. These trends can be seen in Census data and archival records from the Heinz History Center. This research can be used by other decaying, industrial communities that need to revitalize themselves as a template for how to retain their population and popularity while not sacrificing their sense of community pride.

22 Atypical Presentation of Breast Milk Jaundice in a 2-month Old
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Jaundice is a common condition seen in newborns as the yellowing of skin, conjunctiva, or oral mucosa. This discoloration is caused by excess bilirubin accumulation in tissues, commonly due to various physiologic or pathologic etiologies depending upon the child’s initial age of onset. It is typical to see jaundice in the first days of life due to numerous physiologic causes, including physiologic jaundice, breast feeding jaundice, and breast milk jaundice. Specifically, breast milk jaundice is caused by factors in the breast milk that block liver proteins which assist in bilirubin degradation. Presentation of breast milk jaundice usually begins in the first or second week of life, with resolution by 6-8 weeks of age. We present a case of breast milk jaundice in a 2-month-old male with initial assessment of bilateral scleral icterus, a symptom of jaundice, at his routine pediatric visit. Jaundice at the onset of two months of age is usually due to pathologic conditions such as genetic disorders, factor deficiencies, infections, and liver or gall bladder disorders. The severity of this condition sheds light on the importance of proper work-up to discover the etiology, and to prevent potentially harmful complications of jaundice.

23 Atypical Presentation of Lyme Disease in a Four Year Old
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Lyme disease is the most common vector-borne illness in North America and an endemic in Pennsylvania. This infection has three different stages with specific signs and symptoms for each phase. Lyme disease affects many organ systems, including dermatologic, cardiac, ocular, neurologic and orthopedic. The most common symptom patients report is monoarthritis. This is a case of a previously healthy four year old male that presents with trismus, torticollis and right knee pain and swelling. The patient had a thorough work up that was found to be normal except for a positive Lyme titer. Although oligoarthritis is a very common manifestation of late Lyme disease, both trismus and torticollis are atypical. The patient’s presentation is so unusual that many different diagnoses were considered due to the torticollis and trismus. Not only different diseases, but different stages of Lyme disease were considered, as neck stiffness can be a manifestation of early Lyme disease, where oligoarthritis occurs later in the disease. Each of these stages have different treatments and the correct stage must be identified for proper care. Additionally, because atypical symptoms complicated the recognition of Lyme disease, unnecessary tests were ordered to properly diagnose Lyme disease. Identification is very important to prevent long term complications and provide proper treatment.

24 Atypical Presentation of Pneumonia in a Pediatric Patient
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Pneumonia can present in a variety of ways in pediatric patients. It usually manifests with respiratory signs and symptoms such as fever, tachypnea, and dyspnea. In some cases of pneumonia, pediatric patients can experience abdominal pain, which may be the only symptom. In such cases, clinicians usually focus on gastrointestinal causes of abdominal pain rather than considering extrapulmonary symptoms of pneumonia when evaluating these patients. This causes delay in determining the accurate diagnoses and choosing appropriate therapeutic interventions. We present a case of an 8-year-old white male who presented with abdominal pain and fever as the only sign and symptom and was incidentally found to have left lower lobe pneumonia on CT scan of abdomen and pelvis. He was evaluated for appendicitis and was misdiagnosed with gastroenteritis twice which led to a delay in therapeutic intervention. He was treated with an antibiotic regimen and his symptoms resolved completely.

25 Cement Pulmonary Emboli After Kyphoplasty Necessitating Long-Term Anticoagulation
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Minimally invasive percutaneous vertebral augmentation procedures, such as vertebroplasty and kyphoplasty, are increasing in popularity as the treatment of choice for compression fractures. However, these procedures are not without risk. Pulmonary cement embolism is one adverse effect that requires particular attention. Clinical presentation ranges from asymptomatic to life-threatening arrhythmias. Recognition of the complication is crucial, yet management strategies remain highly variable. We present a 54 year old male who complained of lightheadedness and pre-syncope with associated nausea and diaphoresis status post kyphoplasty five days prior. A computed tomography angiography of the chest revealed pulmonary and intracardiac cement emboli. The patient was started on intravenous heparin while inpatient and was discharged home on oral apixaban (Eliquis).
26 Cervical Stenosis Following Cesarean Section in a 34-year-old Female
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Cervical stenosis is a gynecologic condition which may be congenital or acquired resulting in narrowing of the cervical canal and restricting passage into the body of the uterus. This condition is most often acquired due to gynecologic cancers, radiation treatment, menopause, and surgical procedures, such as cold knife conization, loop electrical excision procedure, or endometrial curettage. In premenopausal women, symptoms of cervical stenosis may include amenorrhea, dysmenorrhea, irregular menstrual cycle, pelvic pain, or infertility. A dangerous complication that may arise from cervical stenosis is the development of hematometra. This is an accumulation of blood and endometrial tissue within the uterus due to the inability to flow out through the cervix. We present the unique case of a 34-year-old female without known risk factors who developed cervical stenosis and hematometra following the delivery of her youngest child and third cesarean section. The patient was successfully treated with manual dilation of the cervix. This patient's presentation illustrates an atypical and uncommon case of cervical stenosis which may help to further expand the etiology behind the gynecologic condition.

27 CGRP in the left amygdala reduces bladder pain in female mice
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Additional Authors: Abigail Cox

Urologic chronic pelvic pain syndrome (UCPPS) is among the most common visceral pain conditions in the United States, affecting between 5 and 10 million Americans and costing over $5 billion in healthcare annually. UCPPS patients experience debilitating symptoms that severely impact quality of life, including increased urgency and frequency of urination, intense and burning pain during bladder filling and voiding, referred pain in the back and pelvic area, and co-morbidities such as anxiety and depression. The underlying cause of UCPPS is largely unknown, and therefore treatments are poor and ineffective. The central amygdala (CeA) is a bilateral, mid-brain limbic region that processes both pain and emotion. Sensory neurons that relay information from the bladder to the brain express high levels of calcitonin gene-related peptide (CGRP), a peptide with a well-established role in pain processing. Although there is ample evidence that CGRP is pro-nociceptive in the right CeA, few studies indicate that CGRP may act anti-nociceptively in the left CeA. Here, we explored CGRP's contribution to the left CeA's anti-nociceptive role in the context of bladder pain. Immunohistochemical quantification of CGRP expression in the left and right CeA of control and bladder-sensitized mice revealed a significant decrease in CGRP expression in the left CeA of mice with bladder pain. Additionally, infusion of CGRP into the left CeA of bladder-sensitized mice decreased abdominal mechanical sensitivity as well as visceromotor response to urinary bladder distention for up to 75 minutes after injection.

28 Characterization of RarA, a rare and unusual redox active protein
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The metal and metalloid reducing bacterium *Sulfurospirillum barnesii* has a unique redox active protein that when provided an artificial electron donor (i.e., reduced methyl viologen, FMN, or NADH) can reduce a variety of other substrates including arsenate, selenate, selenite, nitrite and even phosphate. The enzyme, RarA, has an inferred amino acid sequence that has no significant similarity to any known protein. Further it does not contain cysteine-residues or metal binding motifs and is only found in certain species of *Sulfurospirillum*. The purpose of this project is to express RarA in *E. coli* and demonstrate it has the same properties as the native protein in *S. barnesii*, conferring general metal/metalloid reductase activity to *E. coli*.

29 **Charles Bonnet Syndrome: An Under-Recognized Cause of Visual Hallucinations**
Jeremy Tock
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Faculty Advisor: Afokoghene Okpozo, PhD, MBBS

Charles Bonnet Syndrome is a disorder where hallucinations occur as a result of visual neurological pathway damage. There is no psychiatric component to the hallucinations, and patients maintain insight that the hallucinations are fictitious. The exact etiology of Charles Bonnet Syndrome is still unclear. The vast majority of patients are elderly and are suffering from common optical conditions such as glaucoma or macular degeneration. Diagnosis is multidisciplinary, and requires a team approach across specialties in order to rule out other potential causes of visual hallucinations. Treatment may involve antipsychotics medications, however, it has not been shown to be effective in all patients. Many healthcare providers claimed they had either no or very little awareness of the syndrome. We present a case of a 96-year-old female with a past medical history of macular degeneration, with complaints of a two-day history of confusion, irritation, and visual hallucinations.

*30 Chemical Chaos in World War I: United States Failure and Success in Responding to the Poison Gas Threat in Europe.*
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Faculty Advisor: Andrew Simpson, Ph.D.

On February 26, 1918, US troops in France faced the first significant chemical attack against the American Expeditionary Force during WWI. German forces launched a mixture of artillery and chemical shells against the 1st Division in France. The casualties were high. Of the 225 men in range of the attack, 85 soldiers, more than one-third, became gas casualties. This attack exposed serious deficiencies in training and equipment the Americans experienced in the face of this new warfare. The deficiencies led to the US experiencing the highest rate of gas casualties by any nation on the Western Front.

This study will show these casualties should have been avoided. The US was well informed on the chemical threat in Europe. Correspondence from US observers to army commanders reported the types of gases used, protections available, and the effects of gas attacks on Allied forces, both physical and psychological. After receiving this information, government records show that US officials implemented a War Gas Investigations unit in the Bureau of Mines, then created a formal Chemical Warfare Service, dedicated solely to the implementation of chemical weapons and chemical defense. However, these new organizations were far behind other allied technologies, despite the fact that examinations of patents and respiratory technologies show that the US was a leader in protections against noxious
gases. Early field reports show the US was forced to rely heavily on French and British resources for defensive measures.

Recent events in the Middle East show the chemical warfare threat is as relevant today as it was in 1918. This study examines why the US faced difficulties in adapting to the new warfare and providing adequate protections for the soldiers. Examining the organizational failures prior to WW1 will show that adaptation is the key to success in any chemical threat in the future.

31 Cicero and the Carolingian Renaissance: A Case Study on the Transmission of Texts and Their Influences in the Middle Ages
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Faculty Advisor: Andrew Simpson, Ph.D.

In the late eighth century, a period of cultural revival known as the Carolingian Renaissance commenced after the crowning of Charlemagne as Holy Roman Emperor. Charlemagne, a leader dedicated to cultural rebirth and uniformity, was in the process of uniting much of Western Europe while initiating and encouraging interests in the restoration of monumental architecture, education, scholarship, and art. One result was the establishment of monasteries and scriptoria, or writing centers, for the copying and transmission of both religious and secular texts. With the development of scriptoria and schools throughout the empire, Charlemagne recruited numerous notable scholars and clergymen, such as Alcuin of York, to help carry out his overall mission and promote the advancement of education and transmission of texts. Simultaneously, cultural and social developments were taking place including increases in educational opportunities and rising literacy rates, uniform writing practices, and the blending of Christian ideology with classical and antique traditions. Through a case study, this poster aims to highlight and provide insight into the relationship between transmitted texts and these changes taking place in Carolingian society as a result. Using transmission records and the intended function for the works of Cicero, a famous Roman lawyer, orator, and philosopher, and understanding the corresponding developments in Carolingian society through archival sources including Alcuin's letters and Charlemagne's Admonitio generalis and Epistola de litteris colendis, this poster will show that the transmission of Cicero's works was directly related to a growing Carolingian literate society. This ultimately contributed to Charlemagne's classical reform agenda. Overall, this study intends to fill gaps in existing literature and challenge the way scholars consider texts in relation to historical narratives told today. In turn, a new way of describing Carolingian culture and understanding the significance of the Carolingian Renaissance and the corresponding transmission of texts will be uncovered.

32 Clinical Deterioration Following Immune Globulin in a Case of Infant Botulism
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Infant botulism is a rare disease caused by the Gram-positive, anaerobic Clostridium botulinum, with toxin types A and B representing the majority of cases. Most infants effected are under 6 months of age and present with nonspecific symptoms, such as weakness, poor feeding, and hypotonia, and often progress to characteristic signs such as bilateral bulbar palsy and descending paralysis. Respiratory failure may occur. Clinical diagnosis is often made prior to confirmatory stool studies in order to initiate
treatment. The only currently approved treatment is Botulism Immune Globulin Intravenous (Human) (Baby-BIG), which contains antibodies against type A and B toxins. Baby-BIG has been shown to reduce lengths and costs of hospitalization as well as occurrence of adverse events. No adverse drug reactions have yet been described and most infants show notable improvement shortly after administration. We present the case of a 3-month-old infant treated with Baby-BIG who had subsequent respiratory failure requiring intubation and mechanical ventilation about 24 hours post-infusion.

33 Comprehension of Written, Auditory, and Combined Modalities by People with Aphasia
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People with aphasia (PWA) have difficulty comprehending written material and auditory material. Previous research has found that presenting content in combined rather than single modalities can increase comprehension accuracy and reading efficiency by PWA when processing single sentences or relatively short narrative passages. PWA also prefer combined modality presentation. Additional research is warranted to determine whether PWA retain these benefits and preferences when processing expository texts of comparable length and complexity (e.g., newspaper articles) to those typically encountered by adults living in community settings. The study purposes were to: (a) examine comprehension accuracy and reviewing time when people with aphasia hear, read, and simultaneously hear and read expository text and (b) record modality preferences.

Participants included 28 adults with chronic aphasia. Participants listened to, read, or listened to and read a total of 36 paragraphs across three sessions. Following each paragraph, the participants answered eight multiple choice questions. Accuracy, time spent reviewing the materials, and preferences were measured across the conditions.

Most participants showed a significant increase in comprehension during the combined auditory and written condition with significant differences between the written only and auditory only conditions and the auditory only and combined conditions. There was a significant main effect across all conditions for reviewing time with the fastest in the auditory condition and slowest in the written condition. Finally, most participants preferred the combined condition (n = 22).

Many PWA may benefit from tools that present information in a combined format (e.g., text to speech systems) and this format may not add additional required processing time. Additional clinical implications will be discussed.

34 Conservative Management of an Atypical Presentation of a Dysembryoplastic Neuroepithelial Tumor
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A 16 year old female presented post allergic reaction from a contrast CT performed 7 days prior. She had perioral and periorbital edema, as well as, pitting edema on her scalp. The brain MRI showed a 1.3 cm lesion in the temporal lobe that was nodular in appearance and hyperintense on T2. Upon further
evaluation, the patient complained of mild intermittent headaches, worsening vision, dizziness, and nausea within the past month. The patient had an unremarkable neurologic exam and was diagnosed with a dysembryoplastic neuroepithelial tumor. The incidence of this tumor is 0.6% in ages 0 to 17 and typically presents with antiepileptic resistant partial complex seizures. Dysembryoplastic neuroepithelial tumors do not usually show malignant potential and first line treatment is complete surgical resection. If the tumor is not resected completely and margins are not clear the tumor may recur however, recurrence rates are low. Due to the patients atypical presentation, surgery is not warranted. If the patient starts to experience seizures the need for surgery will be reevaluated. The patient will undergo repeat MRIs every 3 months to track the growth of the tumor and her symptoms.

35 Content Validity of Considering Diversity: A Self-Reflection Tool for Psychology Teachers
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Compared to 51% of primary and secondary public-school students identified as racially and ethnically diverse, only 20% of their teachers identify similarly (National Center for Education Statistics, 2015). Substantial evidence shows that school-aged youth benefit from teachers with similar ethnic backgrounds (Egalite & Kisida, 2018; Juvonen, Kogachi, & Graham, 2017). To effectively incorporate diversity into the classroom, school personnel must understand how their communities, classrooms, and personal biases manifest in youths' school experience. Considering Diversity: A Self-Reflection Tool for Psychology Teachers is a self-report rating scale that provides insight into ways high school psychology teachers can raise awareness of diversity issues in their classroom. Applying this tool in their classrooms, teachers will reflect on their own diversity awareness and use that insight to create classroom experiences that foster cultural proficiency. This study examines the content validity of the Considering Diversity tool. In this content validity analysis items were subjected to expert review to determine fit with the construct of diversity awareness in the classroom. Six subject matter experts (SME) were asked to determine if each of the thirty-one items were essential to the measure. The SMEs determined that twenty-one questions were essential resulting in content validity ratios (CVRs) of .33 or higher. Items below the CVR threshold of .33 were qualitatively examined leading to six items being altered. These items were reviewed again by the same SMEs. Finally, twenty-two questions were found to have appropriate content validity for examining the awareness of diversity issues in the classroom. The findings suggest the Considering Diversity self-reflection tool has adequate content validity to justify further psychometric study.

36 Contextualizing Disability in the Ancient World for Museum Exhibitions
Grant Stoner
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Museum exhibitions pertaining to the ancient world educate visitors on the varying facets of religion, politics, and social lifestyles. Tools used to erect monuments of deities, statues of infamous generals and politicians, articles of clothing, as well as weapons, constitute the majority of ancient exhibits. However, institutions rarely explore the day-to-day aspects of these civilizations. They particularly fail to discuss
attitudes toward those with physical and mental disabilities. As disabilities are found within every
nation, visitors are unable to adequately understand the inner mechanisms of how each society
functioned without their inclusion. The overall acceptance and rejection of mental and physical
disabilities helped shape ancient empires. Within recent decades, establishments such as the
Smithsonian Institution and the Museum of disABILITY History have incorporated disability-related
artifacts such as wheelchairs, prototypes of varying medical devices, and even personal accounts of
treatments to provide a richer visitor experience. Museums that feature ancient exhibitions should
utilize new objects of interest to broaden understandings, create welcoming environments, and
challenge preconceived notions of disabilities within the ancient world. Through the utilization of
artifacts and texts from ancient Egypt, Greece, and Rome, this poster will explore how museums can
develop new exhibits that portray the disabled experience during ancient times.

37 Co-Workers Suck: Creating Wellness in the Workplace
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Navigating wellness in the workplace can become complicated. Stress from the workplace can lead to
increase stress in the personal life of the counselor which can lead to poor self-care. Addressing the
concerns of workplace wellness can increase self-care practices for individuals. This presentation will
address how to navigate workplace stressors and develop better wellness techniques.

38 Cyanobacteria as a Natural Source for D5-Selective Ligands
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Faculty Advisor: Kevin Tidgewell, Ph.D.

The five dopamine receptors (D1-D5) are members of the G-protein coupled receptor (GPCR) family and
play a key role in cognitive function and neurological disorders. Dopamine-related disorders are difficult
to treat, as multiple dopamine receptor subtypes and other similar receptors can influence the
pathology. Also, a single ligand can have varying effects in the body acting via the five different
receptors.

The D5 receptor is structurally similar to the D1 receptor, which is more widespread throughout the
brain and body. As of today, there are no known D5-selective ligands to explore physiological effects of
the D5 receptor. Therefore, D5-selective ligands are necessary to understand the receptor and its
involvement in dopaminergic disorders.

Cyanobacteria are known to produce natural products that are structurally similar to endogenous GPCR
ligands and can bind to these receptors. Natural products that can interact with GPCRs could therefore
be potential leads for new therapeutics.

The goal of this project is finding cyanobacterial natural products that selectively bind the D5 receptor.
This will help explore the physiological effects of the receptor, and serve as leads for new therapies for
D5-related disorders. Cyanobacterial extract DUQ0024 was fractionated via silica gel chromatography to
produce nine fractions which were screened for affinity against a panel of GPCRs. Seven of the nine
fractions showed binding inhibition at the D5 receptor with IC50 values of 1.7-3.4 μg/mL. Most
Interestingly, these fractions did not show any significant affinity to the D1 receptor. Fraction DUQ0024H was shown to have affinity for D5 with an IC50 of 2.6 μg/mL. Further isolation has resulted in a fraction with two natural products, and efforts to elucidate these structures will be presented.

39 Decolonizing National Parks: A Conversation about Repatriation and Shared Authority
Stephanie Walrath
Public History | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Alima Bucciantini, Ph.D.

This project explores how shared authority in national parks can be reassessed through the lens of administrative repatriation. NPS interpretations often focus on conservation and naturalist education, perpetuate a mythology of "gifted land," and have neglected cultural imprints as an integral element of the land's history. The rich histories of the peoples that have occupied these lands over time provide an opportunity for the NPS that few museums possess: to present an American history that is deeply interwoven with the natural landscape, and recall events back farther than any constructed museums can possibly venture. National parks have an obligation to present historical narratives that strengthen the stories of the landscapes' indigenous populations. This cannot be accomplished through federal interpretation alone. Rather, we must necessarily examine national parks within the public history conversation surrounding repatriation.

When national parks are established on land bearing deep indigenous footprints, they should necessarily be administered or co-administered by native representatives. Mesa Verde National Park and Glacier National Park are presented as case studies in this project to assess the racist history of park administration and suggest how these spaces can be managed, interpreted, and docented by natives in the future. It is altogether possible - and necessary - that native peoples are at the helm of park management in spaces where native stories are (or should be) told. The continued management and interpretation by non-native federal officials represents, at least, a lack of shared authority, and at most, a continued appropriation of native legacies for recreational entertainment. As the field of public history comes to terms with repatriation not only as an ethical imperative but an opportunity for expanded interpretations, native administration in national parks should be at the forefront of the conversation.

*40 Detection and Identification of Model Peroxide Explosives Using Paper Spray Ionization Combined With Tandem Mass Spectrometry
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Due to easy access to raw materials, attacks using peroxide-based explosives are on the rise. Mass spectrometry remains one of the most sensitive and selective measurement tools for small molecules. A challenge for identification of peroxide explosives using mass spectrometry is that the compounds decompose under GC-MS conditions, or in solution when electrospray ionization is attempted. In this study, we determined whether paper spray ionization (PSI), combined with tandem mass spectrometry, would be effective for the characterization of peroxide explosives when sampled directly from swipe materials. A paper spray ionization source was constructed and interfaced to a ThermoFisher Scientific LTQ linear ion trap mass spectrometer. Benzoyl peroxide, dicumyl peroxide, methyl ethyl ketone
peroxide, and di-tert butyl peroxide were used as surrogates for peroxide explosives. Methanol, ethanol, acetonitrile and acetone were investigated as solvents, and Na+, K+, Rb+ and Ag+ as cationizing agents. The peroxide samples were prepared using two different methods; swipe sampling and depositing the solution onto the filter paper before cutting the triangle. Potential structures were probed using density functional theory calculations. Of the peroxides tested, dicumyl peroxide and benzoyl peroxide yielded abundant intact, metal-cationized species. Experiments with methyl ethyl ketone peroxide were plagued by preferential ionization of a stabilizer present in the commercial sample. Di-tert butyl peroxide failed to produce intact protonated or metal-cationized species. Formation of metal-adducts to intact dicumyl and benzoyl peroxide was confirmed by identifying the mass shift when K+ or Rb+ was substituted for Na+. Also observed were ammonium (NH4+) adducts. Semi-quantitative measurements were possible when comparing overall signal intensities of the characteristic peaks from samples prepared with varying concentration of peroxide. Swipe sampling analysis showed lower signal intensity than depositing the solution onto the filter paper. This method demonstrates potential for performing rapid and high-throughput analysis for selective screening of peroxide explosives.

*41 Development of a Metal Ion Extraction Protocol for GSR in Blood Matrices with Analysis on SEM-EDX
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Derived from multiple different professionals expressing a lack of protocol and a lack of research in the field, the main purpose of this study is to extract GSR particles from blood matrices. Through the modification of metal ion extractions, gun-shot residue particles (GSR) is extracted and analyzed for direct comparison by the scanning electron microscope (SEM). Without a modified extraction for the GSR from a blood matrix, the SEM searches and identifies the iron attached to the hemoglobin contained in the red blood cells (RBCs). The extraction of GSR from blood is compared outer hand and trigger finger of the shooter. Samples were obtained by placing whole blood on the gloved hands of a shooter and sampling after a shot had taken place. This process was repeated for three shots with three different caliber pistols - those most commonly found in daily crimes - including Glock 19, 380 Bodyguard, and an FEG 22. The areas sampled were then compared against controls obtained from whole blood stocks and firing controls. Controls comprised of straight human whole blood in Na Heparin coagulant and casings of spent casings. Using the SEM to determine if GSR samples are present, metal ions are extracted from both the plasma and the red blood cells. The red blood cell extraction is performed as not to damage the integrity of the hemoglobin in blood. This extraction technique broadens the scope of collectable GSR samples at a crime scene. Optimization of a metal ion extraction protocol allows for GSR particles to be compared to known samples for further identification.

42 Development of a patient satisfaction measure for rehabilitative services in a substance abuse population
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Faculty Advisor: Jordan Covvey, Ph.D
Objectives: Patient satisfaction is a key component in assessing the quality of medical treatment. Despite its recognized value, there is a gap in the assessment of satisfaction among patients with substance use disorder undergoing rehabilitative services. This pilot study aims to better understand the underlying dimensions of patient satisfaction relevant to substance use disorder rehabilitation using semi-structured interviews and assist in the development of a patient satisfaction tool specific to the population.

Methodology: The first phase of the study included qualitative interviews conducted at The Salvation Army Harbor Light Center, an inpatient drug and alcohol rehabilitation center in Pittsburgh, PA. Inclusion criteria for participation were (1) adult males with a history of substance use disorder who are currently enrolled in the residential program, and (2) counseling staff at the center. An extensive literature review formed the basis for semi-structured interviews, conducted individually with participants. In addition to the areas identified in the literature review, the guided interviews explored new areas related to satisfaction. Directed content analysis of the interviews identified the dimensions relevant to patient satisfaction, allowing the researchers to further design items for a patient satisfaction scale.

Results: Dimensions identified from the semi-structured interviews content analysis were related to the following dimensions such as: physical facility space, overall programmatic structure, effectiveness of counseling sessions, counselor expertise, and effectiveness of referral services. The content analysis also proved effective in determining patients' expectations from the program as well as understanding the gaps of treatment services.

Conclusion: This study provided an insight related to specific dimensions of satisfaction in a residential program. The data will be analyzed to create a patient satisfaction tool specific to substance use disorder rehabilitation. In the second and third phases, the project will seek to validate the satisfaction tool and relate it to programmatic outcomes.

43 Dose-related effects of moderate intensity aerobic exercise on sensitivity to experimentally-induced pain in healthy female participants

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Increasing evidence implicates exercise as a front-line adjuvant therapy for the treatment of nearly all forms of chronic pain. Knowledge of efficacious dosing respective to exercise type and pain condition is extremely limited in the literature.

Purpose: To determine the optimal dose of moderate intensity treadmill walking necessary to reduce acute pain in healthy human participants. METHODS: After screening, 40 female participants (21.6+/-.04 yrs) were pseudo-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 7-day period, participants performed moderate intensity treadmill walking during assigned exercise days (days 1-5). Quantitative measures of pain were measured at baseline (day 0), 5- and 30-min post intervention on days 1, 3, and 5.
and 24 hrs post-final intervention session (day 6) via sensitivity thresholds to painful thermal stimulation and painful pressure stimulation. Subjects also rated the intensity and unpleasantness of both thermal and pressure stimuli qualitatively on a visual analog scale (VAS). RESULTS: One-way ANOVA revealed a significant analgesic effect of treatment for constant pressure pain intensity (F3,36=6.2, p<0.01) and constant pressure pain unpleasantness rating (F3,36=6.4, p<0.01) as measured by VAS. Tukey post-hoc tests showed significant differences between the control and moderate dose groups (p<0.01) and control and high dose groups (p<0.01) for constant pressure pain intensity rating and significant differences between control and moderate dose groups (p<0.01) and control and high dose groups (p<0.01) for constant pressure pain unpleasantness rating. CONCLUSION: In healthy adults, we have identified a dose response of exercise-induced analgesia. Our study suggests that a low dose of exercise is insufficient to induce analgesia. The moderate dose of exercise may be an appropriate starting dose for exercise-based adjuvant pain therapy. An on-going clinical trial is applying these results and techniques in chronic pain patients.

44 Droxidopa: Finding Relief for Neurogenic Orthostatic Hypotension
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Faculty Advisor: Kristin D'Acunto, MPA, PA-C

Orthostatic hypotension is a common condition ailing the elderly population. However, some patients with orthostatic hypotension are affected by a rare subtype, neurogenic orthostatic hypotension. Most commonly caused by diseases that lead to autonomic nervous system dysfunction, effective treatment typically involves supportive care and traditional alpha agonists. However, in patients with refractory symptoms, the new usage of droxidopa is being established. Although the mechanisms of this drug are still being debated, an improved quality of life while taking the drug have been established. We present a 56-year-old male with a history of uncontrolled Type 2 diabetes, controlled on medication, with neurogenic orthostatic hypotension refractory to traditional management. It was determined that management with droxidopa would be implemented into his care plan, and after two months of treatment, remission and improvement of symptoms was achieved, indicating its use as a long-term treatment for this condition.

45 Economics of cystic fibrosis transmembrane conductance regulator (CFTR) modulator therapies in cystic fibrosis: A review of evidence
Zumi Mehta
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Faculty Advisor: Khalid Kamal, M. Pharm., PhD

Introduction: Cystic Fibrosis (CF) is a progressive, genetic disorder that affects the secretory glands in the body. It causes persistent lung infections and affects the ability to breathe. Currently, no cure is available to treat CF. However, with the introduction of effective CFTR modulator therapies, there is an increasing evidence for better patient outcomes in CF. Since 2010, three CFTR modulator therapies have been approved (for certain mutations): Kalydeco®, Orkambi®, and Symdeko®. The annual acquisition cost for these therapies alone ranges from $260,000 to $310,000. In order to assess the value of these therapies, a number of economic analyses have been conducted.

Objective: To review and evaluate economic studies of CFTR modulator therapies in CF.
Methods: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed to conduct a systematic review. Articles from PubMed and Scopus were identified using key search terms. The articles included in the final review were evaluated using the Quality of Health Economic Studies (QHES) tool, which rates the rigor of the economic studies on a scale of 0-100 where 100 indicates excellent quality.

Results: Five articles were identified based on the inclusion/exclusion criteria out of which three studied Orkambi® while two evaluated Kalydeco®. Most studies were conducted from a United States payer perspective (n=4) while one was conducted in the United Kingdom. Based on the QHES scores, all the studies were evaluated as being of high quality with the scores ranging from 84 - 92 (Median = 91). A major limitation common across all studies included the lack of discussion on the study biases and how these would potentially affect the study results.

Conclusions: Even though there are limited economic studies for CFTR modulator therapies, the quality of evidence is high, which is valuable in supporting important healthcare decision making.

*46 Engaging Visitors with Conservation: The Key to Museum Sustainability
Megan Crutcher
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What is museum conservation and why does it matter? Increasingly, museum professionals are having to answer this question not only for themselves, but for the public as well. I argue that conservation’s definition is twofold, encompassing the actual work, as well as public engagement and presentation. First, conservation is the act of preserving and protecting cultural heritage to improve its structural integrity and historical significance. Second, conservation’s ultimate effectiveness lies in its ability to leave the public informed and passionate. Two of the best examples of these programs are the conservation of the Star Spangled Banner at the Smithsonian in 2008, and the visible conservation laboratory, constructed in 2010 at the Musical Instrument Museum in Arizona. Through awareness of the risks and deterioration that heritage faces, the public is better equipped to support museums and historic sites like these. I measure "success'in conservation programming in terms of visitor engagement and museum support. Using reports from the American Institute for Conservation and the National Council on Public History, I conclude that engaging conservation programs utilize: long-term exhibits that revolve around conserved objects, interaction with conservators, visible conservation work, and STEM themes. Thus, these four practices can change the way institutions approach conservation, and through it, visitor engagement.

Paul Weinbaum
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Faculty Advisor: John Mitcham, Ph.D.

Traditional scholarship on the League of Nations generally labels the organization as a failure because it did not prevent the outbreak of the World War II. Yet this literature neglects to examine other important League endeavors. Perhaps the most successful of these efforts was accomplished by the
Health Section led by Dr. Ludwick Rajchman between 1919-1939. Using primary sources including League archives in Geneva, documents from organizations such as the Rockefeller Foundation, and a survey of medical journals, I argue that the Health Section became the world's first transnational health organization and initiated important international public health programs which included the control of epidemic diseases, standardization of laboratory testing, and the development of effective disease treatments.

This paper examines the Health Section's partnerships with private charitable foundations, which provided support for medical education and meetings between scientific and medical experts from different nations. The most important of these conferences are examined, not only because they facilitated the exchange of information and research data, but because they encouraged productive communication between nations that had been bitter enemies during the Great War. The presentation also examines the critical role played by Dr. Ludwick Rajchman in the development and success of the public health programs of the Health Section and his importance in the founding of UNICEF in the post-World War II period. Finally, I argue that the rightward shift in European political sentiment and the change in the leadership of the Health Section during the 1930's led to politicization and significant reduction in the scope and effectiveness of the Section's public health projects.

48 Erythema Nodosum: Case Report of an Adverse Reaction Caused by Nexplanon Etonogestrel Subdermal Implant
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Faculty Advisor: Afokoghene Okpozo, Ph.D.

Nexplanon subdermal implant is a contraceptive which provides three years of pregnancy protection. It is usually well-tolerated by patients, and the side effects reported in most studies focused on are mild. However, this medication is capable of causing a more severe reaction, such as erythema nodosum, which was observed in the presenting case. Erythema nodosum is a skin disorder most commonly characterized by symmetric, tender skin nodules on the lower extremities. It is immunologically mediated due to a type IV hypersensitivity reaction. There are immense number of influences that have been found to cause this type of reaction, including drugs such as antibiotics, oral contraceptive pills, bromides, iodide and TNF-alpha inhibitors. We describe the case of a 21-year-old white female who presented with erythematous nodules on the extensor surfaces of her lower extremities, consistent with erythema nodosum. This occurred following the placement of Nexplanon subdermal implant.

49 Evaluation of Acute Heart Failure Inconsistent with Patient Age and History
Megan Beer
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Faculty Advisor: Brenda Swanson-Biearman, DNP, MPH, RN

A 39-year old male presented to the emergency department with dyspnea on exertion for one week and was found to be in acute decompensated congestive heart failure with a reduced ejection fraction of 20-25% on echocardiography. The patient was treated with Nitroprusside, Lasix, Lisinopril, and Carvedilol, and was placed on a restricted cardiac diet. Following three days of treatment, the patient's jugular venous distention, work of breathing, and heart rate returned to normal, and he was discharged to home with a fair prognosis. Though he had cardiac risk factors in his history, the characteristics of his
heart failure did not match the heart changes most often seen with those particular pathologies. With a history of alcohol use, it is likely that the patient's alcohol consumption combined with the additive effects of hypertension and type 2 diabetes mellitus all resulted in heart failure at a relatively early point in the patient's life. Young patients with heart failure can be difficult to identify as they tend to present without peripheral or pulmonary edema and often have no history of cardiac complications, as was the case with this patient. Congestive heart failure most commonly occurs over the age of 65 and is a differential that is often overlooked in the younger population when assessing the complaint of shortness of breath.

50 Exogenous Heat Shock Protein 70 Mitigates the Olfactory Deficits and Proteinopathy of Lewy Body Disorders in Aged Mice
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The chaperone heat shock protein 70 (Hsp70) refolds misfolded proteins or enables their clearance. Following intranasal delivery, Hsp70 has been shown to improve cognition, reduce neurodegeneration, and extend lifespan in mouse models of aging and dementia, and to improve insulin sensitivity in mouse models of diabetes. However, intranasal Hsp70 has not been tested in Lewy body disorders. We infused Hsp70 into the left nares of 20 month-old male mice daily for 28 days following infusions of preformed Î±-synuclein fibrils in the left olfactory bulb — the first site to develop Î±-synucleinopathy in human Lewy body disorders. Daily Hsp70 delivery significantly mitigated fibril-induced Î±-synucleinopathic inclusions and loss of olfaction. Furthermore, we confirmed that Hsp70 entered the mouse brain from the nares within three hours post-infusion, as demonstrated by immunoblotting on tissue lysates from the olfactory bulb and the caudal recesses of the temporal cortex. Inhibition of Hsp70 activity in vitro with the small molecule inhibitors MAL3-101 and/or VER155008 dramatically increased the number of inclusions in primary neurons harvested from the rat sensorimotor neocortex, entorhinal allocortex, and hippocampus, suggesting a generalizable effect. These collective findings support further testing of the ability of intranasal Hsp70 to impede the propagation of Lewy pathology.

51 Extraction and sequencing of human environmental mtDNA from natural, aqueous environments
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Faculty Advisor: Lisa Ludvico, Ph.D.

The identification of human remains belonging to missing persons has been considered a fairly challenging and universal problem in the field of forensic genetics. However, the recovery of DNA from several different forms of human tissue, bones, and hair has allowed researchers and forensic professionals to further the general effectiveness of missing persons investigations. Yet, DNA has still had little implementation into the process of locating missing persons. Its application would provide a more empirical-based method for the location of drowning victims, persons missing in bodies of running water, or victims of certain mass casualty events. In this study, small bodies of running water will be utilized to stimulate a natural decay of human epidermal tissue. From the decaying tissue, an expulsion
of epidermal cells and other biological matter are collected at different incremental distances downstream, such that we would be able to successfully link said downstream material to our source DNA. This study is developed to act as a proof-of-concept study to determine to what extent human DNA can be pulled from natural environments and sequenced from mixed DNA samples amplified using AFDIL mitochondrial mini-primer sets. The utilization of mitochondrial DNA permits us to obtain a higher specificity for mixed or low concentration samples, due to the application of the mini-primer set on multiple hypervariable regions, matched with the biological material's naturally high copy number. This project will utilize the commonly used Qiagen extraction method in order to demonstrate a universal application of human-based environmental DNA for crime lab use. This form of DNA research will hopefully revolutionize the application modern eDNA analysis has on science, shifting it away from a purely ecological and anthropological background and permitting its function in the applied forensic sciences.

52 FDA Valsartan Recall and its Impact on a patient
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A 70 year-old white female with a past medical history of hypertension, hyperlipidemia, nephrolithiasis, and clear cell renal cell carcinoma (CCRCC) diagnosed and treated three years prior presented with a concern about the July 2018 FDA valsartan recall. Valsartan medications manufactured by Zhejiang Huahai Pharmaceuticals were found to contain N-nitrodimethylamine (NDMA) and nitrosodiethylamine (NDEA). NDMA is a group 2A carcinogen, and this specific patient was on the recalled valsartan for 10 months before developing CCRCC in the absence of other risk factors. Determining causation is very difficult in this case and this statement is supported by a study done by a Danish cohort study (Pottegard A, et al.) that showed no short-term increased risk of cancer due to exposure to NDMA. However, even if the risk is low and causation cannot be determined there are steps a clinician must take when an adverse effect is found in a patient whom is taking a recalled medication.

53 Feline Infectious Keratitis Leading to Eye Rupture - Molecular Determination of Possible Pathogens
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Faculty Advisor: Becky Morrow, DVM
Becky Morrow, DVM

Upper respiratory infections (URIs) are common in felines. Typical signs of URI include sneezing, nasal discharge, ocular discharge, and conjunctivitis, inflammation of the sclera and lining of the eyelids. Keratitis, inflammation of cornea, is a less common sign of URI, and can cause scarring and rupture of the eye. Feline herpesvirus 1 (FHV-1) is currently considered to be the most common primary pathogen associated with the ocular manifestations of URI, however, Clamydophila felis (C. felis) and Mycoplasma felis (M. felis) are also prevalent in cats with conjunctivitis. Feline calicivirus (FCV) and other opportunistic bacteria may also be present. Twenty ruptured, enucleated eyes were evaluated for the presence of bacteria, FHV-1, and FCV using PCR with universal bacterial primers and FHV-1 primers, qPCR with FCV primers, and Next-generation sequencing (using universal bacterial primers). These
techniques allow detection of typically culture-resistant bacteria and insight into co-infections associated with severe ocular disease.

54 Gene Expression Variability Determining Severity and Necessary Intervention in a case of Nail-Patella Syndrome
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Nail-Patella syndrome is a genetic condition that is passed down from parents to their children through autosomal dominant gene inheritance. An 11-year-old white female presenting for her annual well child exam exhibits split thumbnails, congenital talipes equinovarus bilaterally, an irregularly shaped and underdeveloped left patella, absence of a right patella, retractions of her upper extremity DIP joints bilaterally, and left sided developmental hip dysplasia on physical exam. Her past medical history is significant for Nail-Patella Syndrome that was diagnosed during her infancy. The patient inherited the genes that code for the condition from her biologic father. The physical manifestations of Nail-Patella vary greatly in range and severity depending upon the extent to which the inherited genes are expressed in each individual patient's genetic code. Characteristic abnormalities include dysplasia of the fingernails and toenails, aplastic or hypoplastic patellas, underdevelopment or dislocation of the radius causing limited extension and rotation and bilateral iliac horns causing abnormalities in hip movement. Other members of the patient's extended family also have documented Nail-Patella syndrome; however, they all display far less severe deformities and therefore, do not suffer from severe symptoms. The care required for this patient's condition included splinting and casting for the first 3 years of life has corrected the patient's talipes equinovarus as well as approximately 10 surgical procedures in an attempt to correct the osteoarthritis that is a result of her unresolved developmental hip dysplasia and absent right patella. Due to an assault to the growth plate in her right distal femur during a surgical procedure addressing her right knee, which has allowed her to walk, the patient currently presents with a significantly shorter right femur in comparison to her left femur. Due to the 2 and a half-inch leg length discrepancy, and an inability to flex and extend her right knee, the patient displays an irregular gait and walks with a plantar flexed right ankle. Due to the severe OA in her right knee, the patient and her family have been presented with the option of undergoing a through the knee amputation and receiving a prosthetic lower right limb. This case study will illustrate the importance of gene expression variability in determining the extent of deformity in patients with Nail-Patella Syndrome and the consequential interdisciplinary prophylactic and preventative care required to adequately manage such a severe condition.

55 Genetic Variability of White-Tailed Deer (Odocoileus virginianus) in Southwestern Pennsylvania and Applications for Forensics
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White-tailed deer, Odocoileus virginianus, became scarce during the 20th century, prompting conservation efforts by hunters and wildlife managers focused on recovering species. Various strategies
were implemented, including: reintroductions from areas that still had large deer populations; developing bag limits; and seasonal restrictions. This effort was very successful leading to the recovery of white-tailed deer across the U.S. Currently, deer are one of the most abundant and widely-distributed large-bodied mammals in North America. In addition, they are one of the most important game species. However, there are several important management concerns. In numerous states, including Pennsylvania, Chronic Wasting Disease negatively impacts deer populations and has become a major health concern. In addition, there are areas where poaching of deer negatively affects management and reduces legal hunting opportunities. Population genetics provides important information on demography history and the structure of populations, which can be applied to forensics to combat poaching. We genotyped 14 microsatellites for 96 white-tailed deer from southwestern Pennsylvania to examine levels of genetic diversity in this area of the state. The number of observed alleles range from 11-16 alleles with the observed heterozygosity ranging from 0.526-0.974 and the expected heterozygosity ranging from 0.790-0.910. Landscape connectivity is important to understand because dispersal across the landscape affects the spread of CWD in Pennsylvania. In addition, we have developed a molecular panel to assist the Pennsylvania Game Commission in prosecuting poachers by identifying individual deer in forensic samples. Exploring genetic variation of white-tailed deer provides important insights into the population dynamics of this important species and aids in development of tools for wildlife management and law enforcement.

56 Genetic variation in the human relaxin 2 (RLN2) promoter affects in vitro expression, with potential implications for susceptibility to preterm birth
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Relaxin 2 (RLN2) is a peptide hormone produced during pregnancy. Increased RLN2 levels decrease the tensile strength of fetal membranes and can cause early rupture, resulting in preterm birth. Women assaulted during pregnancy are twice as likely to deliver prematurely, and as such it is important to identify pre-existing genetic risk factors in assessing culpability. Previous association studies have linked serum RLN2 levels and the risk of preterm birth with a single nucleotide polymorphism (SNP rs3758239) in the RLN2 promoter. We investigated the consequences of variation at SNP rs3758239 and a nearby compound microsatellite (CT)n(GT)m within the promoter of RLN2 on expression. To do this, a diverse panel of 44 humans was genotyped at the SNP and the microsatellite. The allele frequencies at SNP rs3758239 were 78.4% and 21.6% for the T and C alleles, respectively, consistent with previous reports. At the microsatellite, the number of dinucleotide repeats ranged from 23 to 38, with 31 being the most common. Based on these data, seven different RLN2 promoter haplotypes were cloned into luciferase reporter vectors, and subsequently transfected into a human trophoblast cell line. Expression was measured by luciferase activity and normalized with a co-transfected constitutive Renilla reporter construct. We observed significant differences in RLN2 transcription between dinucleotide repeat lengths (p < 0.005) through one-way ANOVA followed by linear trend analysis. Our data suggests that RLN2 expression increases as the length of the dinucleotide repeat increases. Future work will examine the mechanistic basis for differing expression levels among haplotypes, and its clinical and forensic relevance.
57 Herpes Simplex Virus (HSV) Hepatitis in a Patient with Herpes Simplex Keratitis

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Herpes simplex keratitis is characterized by inflammation and infection of the cornea caused by herpes simplex virus (HSV). Like other herpetic infections, herpes simplex keratitis can lay dormant in the nerve ganglion or flare and produce symptoms. A maintenance dose of valacyclovir is used to prevent recurrences; trifluridine eye drops are used to resolve flares. A healthy 47 year old white female presented with chronic herpes simplex keratitis of her right eye. She has had multiple flares, but all have been resolved with trifluridine. During a flare, she presented to her primary care physician for her annual preventive exam and complained that her eye was not healing correctly compared to previous flares. A comprehensive metabolic panel (CMP) and referral to gastroenterology revealed acute hepatitis caused by HSV-1 characterized by a nonhealing herpes simplex keratitis flare and elevated liver functions. Because the patient was asymptomatic, she was treated by holding all prescribed and over the counter medications except valacyclovir in order to heal the keratitis. She recovered and her liver functions normalized.

58 Information Needs for Carers Following a Family Member’s Right Hemisphere Stroke

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Right hemisphere disorder (RHD) is an umbrella term used to describe impairments a person experiences following a right hemisphere stroke. Impairments often involve areas of cognition and communication including deficits in executive function, attention, memory, and language (i.e., difficulty with comprehension of complex, non-literal language and other non-spoken aspects of communication). Carers play an important role in rehabilitation and the long-term quality of life of people with RHD. Previous studies explored information needs for carers of persons with aphasia; however, there is minimal research on information needs following a right hemisphere stroke. Understanding the type of information that would be most beneficial is difficult due to the variability of symptoms associated with RHD.

Therefore, the purpose of this study is to explore the information and supports needs for carers following a family member’s right hemisphere stroke throughout different stages of recovery (i.e., onset phase, rehabilitation phase, and chronic phase).

Participants include 3 carers of a family member with RHD, but recruitment is ongoing up to 6 participants. Three online surveys were completed prior to a semi-structured interview over the phone. Participants responded to twenty-eight open ended guided questions addressing general information and each phase of recovery.

Participants consistently reported a desire to receive more information about their family members impairments, their progress during recovery, and supports (e.g., information resources, support groups). Two participants referenced a 'shock period' in the onset phase to which they would prefer to receive general information about their family members condition. As they progressed through the recovery
phases, carers expressed the need to receive more impairment specific information, techniques or strategies to support their family member, and activities. Further analysis for potential themes is needed as recruitment continues. Additional clinical implications will be discussed.

59 Interferon-gamma directs fetal neural stem/progenitor cells towards a glial lineage
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Viral infections of the central nervous system (CNS) are associated with a range of neurodevelopmental abnormalities like microcephaly, epilepsy, and cognitive disabilities, particularly when infection occurs at a young age. Neural stem/progenitor cells (NSPCs) are one of the many CNS cells that can be disrupted during an infection, and alterations in NSPC activity are hypothesized to contribute to the resultant neurodevelopmental disorders. NSPCs have two major functions: to generate new NSPCs or to differentiate to form neurons, astrocytes, or oligodendrocytes. During a viral infection, NSPC function may be affected directly by the virus or by the anti-viral immune response. Interferon-gamma (IFNγ), a cytokine released by activated immune cells, is important for viral clearance in the CNS. We hypothesized that IFNγ could inhibit both proliferation and differentiation of NSPCs during a viral infection. To test this hypothesis, murine embryonic NSPCs were treated with IFNγ in vitro and monitored for proliferation and production of new neural cells over time. We found that IFNγ significantly restricted NSPC growth through multiple measures (neurosphere area/diameter, cell cycle progression). NSPC differentiation was also altered by IFNγ treatment. IFNγ reduced the number of immature neurons (doublecortin+ cells) and mature neurons (MAP2+ cells) after 5-7 days in vitro (DIV). In contrast, IFNγ increased the number of astrocytes (GFAP+ cells) compared to untreated cells. These findings suggest a possible decrease in neurogenesis and an increase in astrogliogenesis following IFNγ treatment. CNS insults leading to a reduction in neurogenesis at an early age may impair cognitive processes that influence memory and progressive learning later in life. Thus, understanding the role of inflammatory cytokines like IFNγ on NSPC function could help define the role of the anti-viral immune response in neurological dysfunction.

60 Linx Reflux Management System as An Alternative to Chronic PPI Use
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Faculty Advisor: Kristin D'Acunto, MPA, PA-C

Gastroesophageal reflux disease (GERD) occurs when one's lower esophageal sphincter (LES) relaxes inappropriately and allows gastric contents to expel backwards into the esophagus causing dyspepsia along with other symptoms such as cough. Patients with this chronic disease are commonly placed on proton pump inhibitors (PPI's) and often have tried antacids and H-2 antagonists. Although these medications may help decrease the severity of symptoms, many patients still experience them. The Nissen fundoplication, an anatomy changing surgery that tightens the LES by wrapping the fundus of the stomach around the LES, was an option for these treatment resistant patients. However, with new research and technology, the LINX Reflux Management System was created in 2013. Now, patients who suffer with chronic GERD symptoms can now choose the LINX system as an alternative to chronic PPI
therapy. This system is a small flexible band of titanium beads with magnetic cores that is placed around the LES and reinforces it to prevent reflux. Therefore, patients are now able to obtain relief from their GERD symptoms with less time in surgery, less hospital stay and little to no complications. This system far outweighs the benefits of chronic PPI therapy. We present a case of a woman who underwent the LINX procedure after years of continual GERD symptoms with PPI therapy.

61 Ludwig's Angina in a 16-year-old Male with Stage 4 Squamous Cell Carcinoma of the Larynx
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Faculty Advisor: Afokoghene Okpozo, M.B.B.S., Ph.D

The purpose of this case is to highlight the potentially life-threatening infection, Ludwig's angina, in a 16-year-old male patient with Stage 4 squamous cell carcinoma of the larynx. Management of the squamous cell cancer included a radical laryngectomy, left hemithyroidectomy and bilateral neck dissection, a tracheostomy, and radiation therapy. He developed radiation dermatitis after these procedures. Nine months after the management of the laryngeal squamous cell carcinoma, he observed facial swelling, neck pain, and anterior neck cellulitis, all stemming from his tracheostomy site. After evaluation of the patient's symptoms he was diagnosed with Ludwig's angina, a soft tissue infection of the submandibular space. This presentation was atypical since Ludwig's angina generally arises from infections of odontogenic origin.

62 Lyme Disease Presenting as Asymptomatic Complete Heart Block
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Lyme disease is fairly common disease contracted through the bite of an infected tick. Typically presenting with an erythema migrans rash and flu like symptoms, Lyme disease is an easily diagnosed and treatable illness when symptomatic. Lyme carditis, though, is an extremely rare manifestation of Lyme disease, and can be difficult to diagnose and suspect without a high level of clinical suspicion. We present a case of an asymptomatic 60-year old male presenting to his family doctor for a yearly EKG that revealed a third-degree heart block, which was later found to be caused by Lyme disease. He was given doxycycline and a permanent pacemaker inserted to treat the Lyme carditis. Treating Lyme carditis with a complete heart block can be difficult, as some patients may require temporary pacing, permanent pacing, doxycycline for the Lyme disease, or a combination of pacing and antibiotics to fully cure the disease.

63 Management of Chronic Thromboembolic Pulmonary Hypertension (CTEPH)
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Chronic thromboembolic pulmonary hypertension (CTEPH) is a vascular disorder secondary to obstruction of the pulmonary arteries from thromboembolism, leading to scarring of the arteries and chronic pulmonary hypertension. CTEPH is a very rare condition affecting 0.5 - 4% of patients after having an acute pulmonary embolism and an annual incidence of 3-5 cases per 100,000. Pulmonary
thromboendarterectomy (PTE) is the gold standard of treatment and was found to completely resolve symptoms in over 92% of patients. Though it is rare that patients are refractory to PTE, providers need to be aware of this and more treatment options need to be explored for refractory patients. We describe a case of a 53 year old white female with a history of chronic thromboembolic pulmonary hypertension (CTEPH), CHF, COPD, MTHFR gene mutation and 20 year pack history of smoking who has already undergone a pulmonary thromboendarterectomy and is on the only approved medication for CTEPH, her symptoms of severe shortness of breath and pulmonary hypertension are unresolved.

64 Mapping Ancient Ruins: Creating a Digital Teaching Resource for Ancient Greece
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Faculty Advisor: Jennifer Taylor, Ph.D.

This project seeks to provide a resource for students and teachers of Ancient Greece, specifically ancient temple sites and their features. In order to accomplish this I created an interactive map. Maps are an excellent classroom resource because not only does it help teach students geography skills it can also be a more interesting way to learn information then doing traditional research. I sought to create a digital mapping project that would provide teachers with a one-stop resource for teaching students about mythology and Greek architecture as it pertains Greek temple sites.

Through the map and its accompanying lesson plans and activities students will be able to locate and learn about 44 ancient temple sites throughout the Ancient Greek world. The map, created in Environmental Systems Research Institute's Story Map mapping tool, uses satellite imagery as the basemap so that students can see where these ancient sites are located within the modern landscape. The map is also split into ten layers which includes an overview of all the sites, sites grouped by modern countries' borders, and sites grouped by major god/goddess. This layout will allow students to compare and contrast temple sites based on location, architectural styles, temple use. Each plotted point will provide basic data and a brief history of the temple site that can be used to complete the activities in the lesson plans.

As technology continues to permeate schools it is important to have digital tools and resources that can be used in the classroom. As public and digital historians it is imperative that we create digital content for teacher use. Providing a well researched website with related lesson plans and activities is a great tool for educators who do so much already.

65 “MAP”ping Our Way Towards Greener Catalysis
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Additional Authors: Wrebekah Frederic

Many homogeneous catalysts that are utilized in modern organic syntheses are composed of transition metals. One reaction that has attracted significant attention recently is transfer hydrogenation-dehydrogenation, which can facilitate highly atom-economical oxidations, reductions, and formations of C-N and C-C bonds. Unfortunately, the catalysts most often used for these reactions contain 4-d and 5-d transition metals such as ruthenium, iridium, and osmium. Recent pushes for sustainable and more
environmentally friendly catalysts have led many researchers to focus their studies on 3-d transition metals, which are more accessible, cheaper, and less harmful to the environment. Nickel is one of these 3-d transition metals that has attracted much consideration but has been underutilized through the years because of its difficulty to control. Our focus lies on finding ligands that can be selectively modified to tap into nickel's catalytic potential. Monoprotic aminophosphines are a class of potentially useful ligands that contain adjacent nitrogen and phosphorus atoms. By combining pairs of commercially available nitrogen-containing and phosphorus-containing precursors, we can prepare multiple systematically varied analogs. This allows us to explore the effect steric bulk, acidity/basicity, and flexibility have on the catalytic properties of nickel. So far, four ligands have been synthesized, two of which have been successfully coordinated with nickel(II). The resulting 4-coordinate complexes are high-spin with tetrahedral geometry about the nickel center. Preliminary studies have focused on optimizing the synthesis and purification of this class of compounds and exploring their stability and reactivity.

66 Mechanical Bowel Obstruction caused by a Gastric Stimulator in a Gastroparesis Patient
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Gastroparesis is a condition that results in delayed gastric emptying which causes symptoms such as nausea, vomiting, abdominal pain and early satiety. Treatment options range from conservative to surgical depending on the degree of severity and response to more conservative therapies. This case report is of a 29 year old white female diagnosed with idiopathic gastroparesis that has undergone gastric stimulator implantation 2.5 years ago. This young female presented multiple times with symptoms of small bowel obstructions within the past year. Her most recent presentation of fever, severe abdominal pain, nausea and multiple episodes of emesis warranted emergency surgery. Upon exploratory laparotomy, it was discovered that the bowel obstruction was caused by gastric stimulator lead strangulation of the small bowel. The patient recovered without incident and was discharged on post-operative day 7. Review of current literature revealed only one other reported case of this complication in patients with a gastric stimulator in situ. As a new and innovative treatment option without much evidence, it is vital that this potential complication be understood by surgeons implanting these devices. Repeated presentation of possible bowel obstruction in patients with implanted gastric stimulators should indicate the possibility for lead strangulation of bowel.

67 Microaggressions: Language as a Tool of Power
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Some time ago, I sat in a class with an old friend before me. My classmate was Saudi Arabian and clearly a follower of her faith, as evident of the hijab on her head. I, stewing madly in my sorrow at being forced to begin yet another scheduled class, lounged back in reflection. Mindfully pondering across the timeline between my ancestors being boarded onto slave ships all the way up until that moment. The class game featured objects and every table was tasked to provide them adjectives. When the teacher got to us she paused. I noticed. She picked up the toy gun from between us and spoke "We don't have to talk about guns anymore today.'Hm. I still wonder which of us she was referring to.
Language is a tool of power that can crush or build in a moments notice. By providing theoretical explanation through the intersection of language, power, and race, I seek to review what a "microaggression" is and not only define it for the viewer but give meaning and context to how such language shapes us. I provide applicable solutions which strive to enlighten the viewer's perspective. By showcasing a look into a restrained, yet remarkably radical, perspective of a Black woman in America, I seek to display how they may be propagating the oppressive tactics they may seek to dismantle.

68 Mixture Models to Predict Colloidal Properties of Triphasic Nanoemulsions Designed for Pain Treatment and Neuroregeneration
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Although nanomedicine has shown promise, clinical translation continues to be a major hurdle (Satalkar, Elger et al, Nanomedicine: Nanotechnology, Biology and Medicine 2016). Further, nanomedicine is underutilized in development of new treatments for pain and support of neuroregeneration. We postulate the complex triphasic perfluorocarbon (PFC)/hydrocarbon (HC)/water nanoemulsions (NEs), developed in our group (Patel et al, Plos One 2013, Janjic et al, Biomaterials 2014), can be engineered for use in pain and support of neuroregeneration by using quality by design methodologies, leading to streamlined clinical translation. We present here novel predictive modeling strategies for tuning nanoemulsion quality attributes in early product development stages, which can be further expanded to GMP manufacturing.

The aims of the project were to characterize and evaluate long-term stability of nanoemulsions for use in pain; and to develop a strategy to predict NE properties using mixture composition data. Nanoemulsions were produced by high-shear microfluidization (Liu et al Bioresearch Open 2015, Janjic et al Biomaterials 2014). Size and PDI were recorded periodically using dynamic light scattering (DLS). A least squares multilinear regression method was used to fit models to predict NE size.

Two HC oils, two PFC oils and a PFC-HC conjugate (Janjic et al JACS 2008) were investigated as mixture variables. NEs demonstrated adequate stability in all formulations considered. The HC oil component imparts superior stability compared to PFC oil. Leave-one-out cross-validation was conducted to assess model predictive performance.

Triphasic formulations presented here show high degree of stability, multimodal imaging properties, neuroinflammation targeting capacity, and extended drug release profile. These features make them an attractive formulation platform for targeted drug delivery in pain and neuroregeneration. Mixture models can be fit using a concise data set which can simply explain relationships between composition and NE colloidal properties and can accurately predict properties.

69 Multi-targeted inhibitors of mitochondrial one-carbon metabolism and cytosolic de novo purine synthesis enzymes as anti-tumor agents
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Targeting cellular one-carbon (1C) metabolism in cancer cells with pyrrolo[3,2-d]pyrimidine analogs provides in vivo antitumor efficacy. We discovered a first-in-class series of 5-substituted pyrrolo[3,2-d]pyrimidine analogs (AGF291, AGF320, AGF347) with inhibition of serine hydroxymethyltransferase 2 (SHMT2), a key enzyme in mitochondrial 1C metabolism and a reported oncodriver. In addition, AGF291, AGF320 and AGF347 inhibited de novo purine nucleotide biosynthesis at glycinamide ribonucleotide formyltransferase (GARFTase) and 5-aminomimidazole-4-carboxamide (AICA) ribonucleotide formyltransferase (AICARFTase), and serine hydroxymethyltransferase 1 (SHMT1). In vivo studies demonstrated excellent antitumor efficacy for AGF347 against MIA PaCa-2 pancreatic adenocarcinoma xenografts in SCID mice with a median tumor growth delay (T-C) of >38 days for 4 mice, and 1 of 5 mice tumor-free 122 days post-treatment. AGF359, a new analog in this series, was a potent inhibitor of KB human tumor cell proliferation in vitro. AGF359 inhibition of KB human tumor cells was reversed with glycine and adenosine, establishing mitochondrial 1C metabolism and de novo purine biosynthesis as the targeted pathways; AICA plus glycine was incompletely protective, implicating AICARFTase as a direct cellular target. AGF359, like AGF291, AGF320, and AGF347, inhibited purified human SHMT2 (Ki = 0.399 ± 0.174 ÅM), SHMT1 (Ki = 0.70 ÅM ± 0.088 ÅM) and AICARFTase (Ki = 8.86 ÅM ± 2.83 ÅM). There was no inhibition of 5,10-methylene tetrahydrofolate dehydrogenase 2 (MTHFD2). Further structural modifications of these multi-targeted agents afforded pyrrolo[3,2-d]pyrimidine analogs AGF307 and AGF312. Cell-based glycine/nucleotide rescue experiments in KB tumor cells established that, as with AGF359, AGF307 and AGF312 were dual inhibitors of the mitochondrial 1C metabolism (AGF307) and de novo purine biosynthesis (AGF307, AGF312). These compounds are currently in further preclinical evaluation as a prelude to possible clinical development as antitumor agents.

**70 Multi-targeted novel 5-substituted pyrrolo[3,2-d]pyrimidines with tumor-selective targeting and inhibition of cytosolic de novo purine biosynthesis and mitochondrial one-carbon metabolism**

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One-carbon (C1) metabolism supports a number of physiological and pathophysiological processes ranging from stem cell renewal to cancer progression. Clinically used antifolates are transported into both tumor and normal cells by the ubiquitously expressed reduced folate carrier (RFC). Uptake of targeted agents via tumor-specific folate receptors (FRs) over RFC would permit tumor-selectivity, while limiting dose-limiting toxicities associated with standard chemotherapy. Serine catabolism in mitochondria is the major source of glycine and C1 units for cytosolic biosynthesis, preserves redox balance and minimizes reactive oxygen species, and is an important source of ATP. Among the mitochondrial C1 enzymes, serine hydroxymethyltransferase 2 (SHMT2) and 5,10-methylene tetrahydrofolate (me-THF) dehydrogenase 2 (MTHFD2) are highly expressed in tumors versus normal tissues. SHMT2 has been suggested to be an important oncodriver. However, there are no clinically relevant inhibitors of these enzymes. To generate potential inhibitors of these enzymes, we synthesized 5-substituted pyrrolo[3,2-d]pyrimidine analogs as structural hybrids of cytotoxic 5-substituted pyrrolo[2,3-d]pyrimidines and me-THF. The 5-substituted pyrrolo[3,2-d] pyrimidine with a four carbon
bridged phenyl side chain AGF300 afforded selective uptake via FRα over RFC, with inhibition of mitochondrial C1 metabolism and de novo purine biosynthesis, resulting in inhibition of KB human tumor cell proliferation. Inhibition of KB cells by AGF300 was reversed by glycine and adenosine. As previous studies of related 5-substituted pyrrolo[2,3-d]pyrimidines established that the nature and length of the bridge plays an important role in determining tumor cell potency and transport selectivity, we replaced the carbon adjacent to the phenyl ring in AGF300 with heteroatoms, including O (AGF323), S (AGF346) or NH (AGF350). These compounds were tested as growth inhibitors against engineered Chinese hamster ovary (CHO) cells singly expressing human FRα (RT16) or RFC (PC43-10). Incorporation of the O, S and NH in the pyrrolo[3,2-d]pyrimidine analogs preserved excellent inhibition of FRα-containing CHO cells (IC50s of 57 nM, 77 nM and 50 nM, respectively); there was no inhibition of cells with RFC uptake up to 1000 nM. AGF323, AGF346 and AGF350 inhibited proliferation of KB cells which was reversed by excess glycine and adenosine. This establishes that for AGF323, AGF346 and AGF350, both mitochondrial and cytosolic C1 metabolism were inhibited. The development of novel compounds targeting mitochondrial and cytosolic C1 pathways with tumor-selective uptake is highly significant in that this would overcome the drawbacks of currently used cytotoxic agents for cancer.

71 New Kensington: The Rise of Aluminum and Organized Crime
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This paper offers a new outlook on the City of New Kensington that lies along the Allegheny River in Westmoreland County, Pennsylvania. Through the research conducted, I have found that the Aluminum Company of America (ALCOA) and the Mannarino brothers were driving factors for New Kensington’s economic rise and fall. Alcoa owned a monopoly on the aluminum production business for decades into the twentieth century. Alcoa was established in New Kensington within a year of the city’s founding and brought an increasing number of residents to New Kensington for the next sixty years. The workers at the aluminum company in 1913 took home 1 million dollars in salaries. The Mannarino brother were mobsters who began their criminal careers in the 1920s and 1930s. By the 1950s their numbers and gambling operations within New Kensington profited an estimated $10,000 to $12,000 a day. As these two entities strengthened their organizations, the community of New Kensington rose in economic wealth as well as population. At New Kensington’s peak during the 1950 census there were 25,146 residents and the population is less than 13,000 residents according to the most recent census. The average household income also showed stagnant and dropping characteristics as the latter half of the twentieth century approached. These phenomena are addressed in this paper as being caused by Alcoa and the Mannarino brothers. In the 1960s the Mannarino brothers began to decrease their influence on the city after one of the brothers was placed on the FBI’s top ten hoodlums list. Within a decade of the Mannarino brothers decreased influence Alcoa left New Kensington for good both leaving the city to slowly decline over the next half century.

72 New Psychiatric Diagnoses Found In Patient With Microduplication Xp11.22-Xp11.23 Syndrome
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Xp11.2 disorder is a microduplication that occurs on the short arm of the X chromosome, and is
classified under microduplication Xp11.22-Xp11.23 syndrome, because of similarities among patient presentation. Also, since this is considered a rare mutation, little research has been done to further differentiate between each specific mutation. While few known cases comprise microduplication Xp11.22-Xp11.23, a noted predisposition between the majority of these patients is autism spectrum disorder (ASD). Typically, this is accompanied by intellectual disability (IQ below 70), delayed speech and language, EEG with centrotemporal focal spike waves, seizures, feet deformities, nasal or hoarse voice, precocious puberty and characteristic facial features including a flat philtrum, widely spaced teeth, synophrys, high nasal bridge and thin lips. An 8 year old white male with Xp11.2, ADHD and ASD, presented for psychiatric inpatient treatment of unique psychological disorders including intermittent explosive disorder, impulse control disorder, and disruptive mood dysregulation disorder not yet documented in other Xp11.22-Xp11.23 patients. We propose that these psychiatric disorders could be included in the phenotypic spectrum associated with microduplication Xp11.22-Xp11.23. The patient's behavior was optimized pharmacologically with Zyprexa 2.5mg twice a day, Focalin XR 50mg every morning and Lithium 150mg three times a day with cognitive behavioral therapy everyday while inpatient. This may be a chronic problem requiring lifelong support.

73 Noncompliance and Nonadherence to ART despite extensive social support in an HIV positive patient with AIDS diagnosis
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This case explores the persistent noncompliance in a 30-year-old HIV positive female with an AIDS diagnosis for three years currently being treated with antiretroviral therapy. The patient has an extensive psychiatric history which includes ADHD, bipolar 1 disorder, schizoaffective disorder, and PTSD from her traumatic and chaotic childhood which contributes to noncompliance, yet with adequate psychiatric care the patient remains nonadherent to ART. She is also nonadherent to her mental health medications and noncompliant with following up with her psychiatrist. The patient has a social history of intimate partner violence, alcohol, crack cocaine abuse for four years. All these factors have been addressed by the clinic staff with little success. Cocaine use has been associated with increased nonadherence to antiretroviral therapy. The only time the patient was compliant was when she was pregnant with her only child. Unfortunately, after giving birth, the patient regressed to noncompliant behaviors, the patient has abused the social services and programs provided to her, each time limiting her eligibility for future assistance. Adherence to ART is the cornerstone to treatment in HIV. Barriers to medication adherence should be addressed by the clinician in order to aid the patient in reaching the treatment goal of an undetectable viral load. This report explores this patient’s noncompliance and nonadherence despite extensive social support.

74 Novel comprehensive treatment program for a homeless population suffering with acute and chronic pain
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With the opioid epidemic on the rise, it is paramount to explore treatment options that comparably decrease acute and/or chronic pain but do not increase require the use of opioids or other narcotics. At the Washington City Mission drug-free Pain Clinic, the goal is just that- to alleviate musculoskeletal pain in a population of homeless adult shelter residents who have previously abused opioids and other legal and illegal substances. This highly vulnerable patient population seeks care once a week to help them manage their pain, benefitting from services such as positional release manual therapy, alpha stimulation, traditional physical therapy, and prayer. This unique menu of treatments provides patients with consistent care provided by an inter-professional team made up of nursing, athletic training, physical therapy, and lay volunteer health providers. Since the Clinic’s opening in October 2018, 30 patients have received multiple treatments at the drug-free pain clinic receiving a range of one to all four of the available treatments. Each member of this multi-disciplinary group of volunteers works to create a positive and spiritually-driven healing environment for the homeless patients sheltered in the Mission without the use of drugs. Currently, there is no evidence to suggest that any another clinic provides these similar services with this same approach to care. While patient feedback and anecdotal evidence suggests that this treatment approach is effective and valued, it is crucial that we examine the methods and outcomes moving forward in order to assess the efficacy of the program so as to confirm suspected outcomes and determine other methods to better aid this high-risk homeless population.

75 Oncology Patient Trust in the Nurse: An Integrative Review
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Trust is an essential component of the nurse-patient relationship - vital for providing patient-centered care and promoting positive health outcomes. Having "trust in the nurse" is especially important for patients who are dealing with chronic and complex illness such as cancer that demands ongoing and intensive nurse interventions. A rapidly growing population of individuals diagnosed and living with cancer warrants the need to identify nursing interventions that promote "patient trust in the nurse" and elicit positive patient outcomes. A literature review was conducted using the model of Whittemore and Knafl (2005) to assess and synthesize literature focused on "patient trust in the nurse" among adults diagnosed with cancer. Results would be used to guide future research. Specific aims guiding this review included: 1) What interventions performed by the nurse, as reported by adult oncology patients, facilitate "patient trust in the nurse"?; 2) How does having “patient trust in the nurse” influence the patient's health and psychosocial wellbeing?; and 3) What attributes demonstrated by the nurse do oncology patients associate with patient trust? A literature search using CINAHL, PubMed and Scopus databases (1980 to 2018) resulted in 13 studies that met eligibility criteria. The majority (n=7) of the 13 studies reflected nurse caring behaviors promoting trust. Four of the 13 studies described “patient trust in the nurse” as an influencing factor in hope, enduring suffering, obtaining treatment, follow up care and a sense of control over cancer. Nurse attributes associated with trust were addressed in three studies and included knowledge, competence, attentiveness, reliability, honesty and professional attitude. Results indicated a paucity of specific nursing interventions aimed to promote patient trust in the nurse in cancer care. Future research is needed to identify and test nursing interventions that promote patient trust in the nurse and support patient-centered quality health and wellness outcomes.
*76 Without Words: Relational Neuropsychology and Creative Arts Therapies with People Managing Aphasia
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Aphasia describes the broad experience of disrupted language production or comprehension acquired after structural changes in the brain, usually the result of stroke. Although common approaches to research and rehabilitation with persons managing aphasia highlight conversation and semantic retrieval, the diversity of symptoms and responses invite consideration of diversity in approach to cognitive rehabilitation. This research proposal considers the question: Does participating in a creative arts psychotherapy program influence cognitive and psychological rehabilitation outcomes for a person managing aphasia? Using quantitative and qualitative methods guided by an integrative, relational neuropsychology, this research explores the complexity of experiences accompanying language loss and neurorehabilitation through two single-subject case studies where participants engage in a 6-8 session creative arts psychotherapy program. Attendees be invited to participate in a hands-on demonstration of a brief creative arts intervention for cognitive rehabilitation. Discussion will includes the feasibility and utility of an integrative, interdisciplinary approach to aphasia therapy, contributing to research in clinical neuropsychology, relational theory, and creative arts therapy.

77 Optimization of Pre-Fractionation for Increased Detection of GPCR Ligands from Cyanobacteria
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Kevin Tidgewell PhD

Marine cyanobacteria are known to produce anti-cancer, anti-biotic, and anti-viral compounds, however, the activity of cyanobacterial metabolites in the CNS has not been well studied. Our lab has screened over 37 cyanobacterial extracts against a panel of GPCRs and the results confirm that these organisms produce metabolites which bind to a variety of CNS receptors. Although many of our extracts have promising activity, one challenge is to isolate new natural products amid the known major secondary metabolites. In order to increase the detection of minor compounds with CNS activity, there is a need to improve the standard method for cyanobacterial processing. The aim of this study was to analyze the biological data from our cyanobacterial fraction library and to develop a new fractionation method which increases the detection of activity from minor compounds. Our analysis revealed that the greatest number of hits come from the most polar third of fractions, and these fractions comprise 50% of the extracted mass, suggesting that the activity of minor compounds may be undetectable. This data was used to develop a new fractionation method that would result in a more even mass distribution. As a proof of concept, a cyanobacterial sample was extracted and subjected to both the old and new fractionation protocol. The fractions obtained indicate that the new method produced fractions with more evenly distributed masses. Fractions are currently being screened for biological activity. Our expectation is that the fractions produced using the new method will demonstrate activities that are not detected using the old method. We believe that this newly developed method will enable us to detect the activity of low concentration compounds, and more easily isolate novel metabolites active in the CNS.
78 Patient Reported Outcomes Tools and Shared Decision-Making in Pediatric Epilepsy Population and Their Caregivers: A systematic review

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Introduction: In pediatric epilepsy, parents/caregivers play a crucial role from helping children understand the disease to making treatment decisions. The success of shared decision-making (SDM) between the clinician and a child relies heavily on the participation of parents/caregivers. To improve SDM, patient reported outcome (PRO) tools focusing on children are utilized. However, some PROs focus only on parents/caregivers, limiting a clear understanding of the child's beliefs regarding the disease or treatments. The objective of the review is to identify PRO tools used to improve SDM in pediatric epilepsy.

Methods: The PRISMA guidelines for systematic review was followed and articles referenced in PubMed, CINHAL, and Psycinfo between 1995-2016 were searched. The articles reviewed focused on pediatric epilepsy and included PRO tools used in SDM. Review articles, thesis/dissertations, editorials and case studies were excluded from the review.

Results: A total of 256 relevant articles were identified and based on the inclusion/exclusion criteria, 12 articles were included in the final review. Generic PROs used in pediatric epilepsy patients included Measure of Process of Care-20, Children's Depression Inventory, Parent Medical Interview Satisfaction Scale and disease-specific PROs included Child Health Questionnaire (child version), CHQ-PF (Parent version), Epilepsy Side-Effects Questionnaire, Children Behavior Checklist, Young Adult Self-Report, and the PEDSQL Epilepsy Module. Children, aged 5-12 years, completed the child versions. Caregivers noted a lack of education about multiple treatments options, and negative treatment outcomes as factors that impacted their child's health. Overall, SDM was lacking when treatments were discussed by clinicians.

Conclusion: Limited PRO tools are available to obtain both caregiver's and children's views regarding epilepsy and its treatments. Most PROs focused on either the treatment or disease severity and exhibited high variability in use. There is a need to optimize PRO tools in pediatric epilepsy so as to improve their performance and improve SDM.

79 Platelet Dysfunction Characterized by Isolated Impaired Response to Epinephrine

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Platelet aggregation disorders due to declined response to agonists, epinephrine, ADP, collagen, arachidonic acid and ristocetin, are rare conditions that are thought to be inherited. Because these conditions are not widely researched, data on the prevalence, etiology, and epidemiology are not well known. Platelet aggregation disorders such as these typically result from decreased response to multiple or all of these agonists. This lack of response interferes with the aggregation of platelets and therefore can cause a delay in clot formation. Complications of platelet aggregation disorders include excessive bleeding episodes after trauma to the body such as tooth extractions or childbirth. Platelet aggregation disorders are theorized to be familial but this pattern of inheritance has not been widely researched and
therefore the cause and pattern of this is not well known. We present a case of a 73 year old female with a history of multiple episodes of excessive bleeding who is found to have a platelet dysfunction due to the isolated decreased response to epinephrine during a pre-operative work-up for a cholecystectomy.

80 Population comparison of snow leopards in China using a noninvasive genetics approach.
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Snow leopards (Panthera uncia) are cryptic predators found throughout 12 range countries in Central Asia. While downlisted from Endangered to Vulnerable by the IUCN in 2017, their population status remains largely unknown. China borders all snow leopard range countries and contains the largest subpopulation of the species. While in-country efforts to census snow leopards have been made, reliable abundance data is lacking as this big cat is elusive, occupies a wide range, and has limited numbers. Noninvasive genetics via the analysis of DNA from scat circumvents many of these issues. This study assessed three areas of snow leopard habitat in China over summer 2018 (Yushu, Qilianshan â€“ Gansu, and Dulan County) to determine population parameters in order to prioritize areas for conservation. In total, 357 samples were collected. DNA was extracted and subjected to a species identification assay via amplification of a segment of the CYTB gene, followed by individual identification using 8 microsatellites. Sex identification was completed by amplifying a segment of the AMELY gene. Approximately one-quarter of scat samples were of snow leopard origin (23.3%). Individual abundance was highest in the Qilianshan Mountains (13 females, 7 males), followed by Dulan County (6 females, 1 male), and lowest in Yushu (6 females, 0 males). Surprisingly, genetic diversity was greatest in Yushu and lowest in the Qilianshan Mountains. Snow leopard populations in the Qilianshan Mountains of Gansu Province appear to be stable, but may have fewer migrants. The survey area in Dulan County supports a smaller population of snow leopards, which may be due to competition with other sympatric carnivores. Snow leopard numbers in Yushu were lower than expected given past population estimates and genetic diversity metrics and warrants continued monitoring. Further sampling in China is needed to better understand snow leopard population status and genetic structure for effective conservation outcomes.

81 Predictors of Unreported Sport-Related Concussions Among Youth Athletes
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Purpose: Behavior may be characterized as risk-taking if it results in negative consequences, yet the person engages in that behavior anyway in order to obtain a desirable positive consequence (Moore & Gullone, 1996). Athletes that continue to play in the face of suspected concussion are engaging in a risky behavior. Kroshus et al. (2015) reported that nearly 48% of college athletes (excluding hockey and football) continued to play while symptomatic of a possible concussion. Youth athlete reasons for playing through and not reporting a concussion are of increasing interest. This study aims to understand variables associated with not reporting sports related concussion. The Adolescent Risk-Taking Questionnaire (ARQ), developed by Gullone, Moorise, Moss, and Boyd (2000), is a Likert-scale survey of
likelihood to engage in risky behavior. Thrill-seeking, rebellious, reckless, and anti-social behaviors (factor structures in ARQ) may be related to not reporting a sports related concussion. This study aims to answer two research questions: 1) To what extent do risk-taking behaviors predict the number of unreported concussions in youth athletes; and 2) What are reasons why youth athletes have not reported a suspected concussion.

Methods: Approximately 300 youth athlete participants completed a comprehensive survey regarding concussion knowledge and beliefs, previous reporting of concussions, and risk-taking behavior. To answer the first research question, hierarchical regression will be used to determine the amount of variance accounted for by gender, existing knowledge of concussion, and number of previous concussions in the prediction of number of unreported concussions while playing youth sports. Frequency counts will be computed to identify the reasons why the youth athlete participants did not or would not report a suspected concussion.

Discussion: The poster will discuss implications of findings for sports-related concussion research, as well as practice implications for those who try to prevent and manage athlete sports-related concussion.

82 Psychosis as a New Phenotype of Sporadic Hemiplegic Migraine and its Treatment
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Hemiplegic migraines are an uncommon type of migraine with sporadic and familial subtypes. There is a genetic component in the disorder, since in some cases, there is a relative with a hemiplegic migraine. The condition is referred to as familial hemiplegic migraine. If there are no known relatives with the disorder, it is a sporadic hemiplegic migraine (SHM). The motor symptoms range from weakness to hemiplegia or paresis which is fully reversible within hours or weeks. The clinical picture varies but can include symptoms from sensory changes to confusion. Psychotic features are not typical findings in patients with hemiplegic migraines. This case describes an episode of SHM in a 55-year-old female with a history of one previous migraine and associated paralysis. In this attack, she experienced paranoia, delusions, and illusions without personal history of psychosis or family history of psychiatric conditions. The antipsychotic drug, Olanzapine, is effective in the current management of both psychosis and migraine in patients with psychosis and a concurrent SHM.

*83 Resveratrol loaded nanoemulsions and microemulsions designed as safe, natural alternatives to opioids for the treatment of surgically induced chronic pain
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Opioid abuse and overdose deaths have reached epidemic proportions worldwide, particularly in the United States, where the opioid crisis was declared a public health emergency in October 2017. Natural products are a desirable and safer alternative. Resveratrol, a well-known natural product from red wine, blueberries, and many other foods, was found efficacious in a variety of animal pain models, including
diabetic neuropathy, chronic constriction injury, and incision induced allodynia. However, resveratrol efficacy was poor in human trials. This is due in part to resveratrol's poor water solubility, rapid metabolism, and chemical instability. To address these challenges, we developed nanoemulsions as an alternative resveratrol delivery approach. Nanoemulsions range from 140-150nm in diameter and can therefore be used to provide targeted delivery to macrophages, inflammatory cells involved in the progression from acute to chronic pain. Nanoemulsions presented here are highly stable, non-toxic, and improve resveratrol solubility. Resveratrol nanoemulsions decrease macrophage production of tumor necrosis factor-\(\alpha\) and nitric oxide, two inflammatory mediators associated with chronic pain. Resveratrol nanoemulsions also effectively reduced pain in male mice in two separate pain models; (1) plantar incision and (2) prostaglandin E2 sensitization. Immunohistochemistry shows that resveratrol nanoemulsion specifically targets macrophages in vivo. Resveratrol nanoemulsion labeled macrophages were identified both at the site of injury (paw) and at the sciatic nerve. Given these promising results, we have begun the development of a resveratrol microemulsion platform. Microemulsions range from 15-20nm in diameter and can therefore be used to provide resveratrol delivery to neurons, as their small size limits their recognition by macrophages. Microemulsions presented here were developed using a quality by design approach that included design of experiments, statistical modeling, and extensive quality control. This approach was used to quickly and efficiently identify the most suitable formulation for future in vitro and in vivo trials.

**84 Rhodotorula Mucilaginosa: Treatment of Fungemia in an Immunocompromised Patient**

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A 27 year old female receiving total parenteral nutrition (TPN) via a PICC line due to short gut syndrome secondary to mesenteric vein thrombosis with a prothrombin gene mutation was admitted to the hospital with fever and chills. Blood cultures revealed Rhodotorula mucilaginosa to be the cause of fungemia in the patient. Due to the replacement of the PICC line and subsequent negative blood cultures, isavuconazium sulfate was prescribed rather than amphotericin B in the patient to ensure eradication. Limited data suggests sensitivity to isavuconazium sulfate, but most documented treatments utilize amphotericin B regardless of a patient's severity of fungemia or major adverse effects associated.

**85 Salary, Negotiation, the Child Penalty, and Sexual Harassment in School Psychology Faculty**

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During the last three decades, women have made progress in narrowing the gender pay gap, which is a statistical indicator of women's earnings as compared to that of men (AAUW, 2005; Brunner, 2007). According to the American Psychological Association Center for Workforce Studies, the full-time salaries of doctoral level respondents across all settings in 2007 are disparate in favor of men in all categories of years of work experience. In explanation of such gender differences in salary, some factors unique to women and others to men, appear to account for the discrepancy. The factors related to women include a greater likelihood to take time off to have or care for children, take family leave or work part time, and
work in nonprofit or local government sectors compared to males (AAUW, 2007). Other factors include horizontal occupation segregation and the probability that female-dominated professions are associated with a clear economic disadvantage (Barth et al., 2002). In order to provide updated information regarding potential gender differences in salary and negotiation outcomes in school psychology university faculty, as well as investigate such issues considering the female domination in the profession as well as the continuum of salary schedules to performance-based pay systems. A total of 75 female and 29 male faculty members completed a survey regarding salary, negotiation practices, and job satisfaction. Multiple regression analyses revealed that females earn less than male colleagues. Implications of these findings for research and practice are discussed.

86 Screening and in vitro transfection parameter optimization of BDNF siRNA loaded lipidoid-nanoparticles for the treatment of chronic neuropathic pain

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Chronic pain affects over 100 million American adults, imposes substantial costs ($635 billion) on the healthcare system at a level that is greater than cancer, diabetes and heart diseases combine. Chronic neuropathic pain is a severely debilitating type of chronic pain that develops after persistent peripheral nerve damage. The limited therapeutic alternatives for chronic pain in the United States lead to an overreliance on the opioid medications takes 115 lives every day, whereas FDA approved non-opioid small molecule medications provide only palliative relief with intolerable side effects. The neuropathic pain rodent models provide compelling evidence that Brain-Derived Neurotrophic Factor (BDNF) released from microglia is a critical signaling molecule in the pathogenesis of pain hypersensitivity. Therefore, knockdown of BDNF in microglia using short interfering RNA (siRNA) against BDNF could provide a promising strategy to treat neuropathic pain. We hypothesize that lipidoid nanoparticle (LNP)-mediated siRNA BDNF delivery is a safe and highly efficient process that will mediate specific knockdown of BDNF in the spinal dorsal horn. The objective of these studies was to conduct preliminary experiments with human astrocytes U-87 MG cells using siGAPDH and siGFP to identify a key LNP and optimize the transfection parameters. A model biodegradable LNPs have characteristic size 100-200 nm, with nearly 50% siRNA entrapment. siGAPDH 50nM-LNP was cytocompatible with U-87 MG cells and demonstrated significant target protein reduction compared to the control group (p<0.05) without off-target toxicity. Furthermore, screening of eight lead siGFP/siGAPDH 50nM-LNP with about 200nm particle size showed that all siGFP50nM and five out of eight siGAPDH50nM-LNPs were well tolerated with U-87 MG cells for 24h. siGAPDH 50nM-306O13 LNPs showed nearly 40% target protein knockdown without intracellular toxicity. We will use highly efficient LNP to determine BDNF knockdown in vitro that will demonstrate the proof-of-principle for our hypothesis and guide the design of subsequent in vivo studies.

87 Selective allosteric inhibition of MEK5: novel target for cancer therapeutics

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Mitogen-activated protein kinase kinase 5 (MEK5) is a component of mitogen-activated protein kinase (MAPK) signaling pathways. Upon activation by mitogen-activated protein kinase kinase kinase 2 (MEKK2); MEK5 phosphorylates and activate extracellular signal-Regulated Kinase (ERK5). Activated ERK5 activates downstream partners to regulate cell proliferation, cell growth, cell differentiation, and angiogenesis. MEK5/ERK5 signaling is upregulated in various cancers, including breast cancers, prostate cancers, and colon cancers; hyper-activation of MEK5 is correlated with poor prognosis for these cancers. Additionally, MEK5 is known to contribute towards chemo-resistance, progression of cancer, metastasis, and epithelial-to-mesenchymal transition. Despite this strong correlation, selective MEK5 inhibitors have remained under-explored.

Using the x-ray crystal structure of MEK1 (PDB: 3SLS) bound to inhibitor 1, a homology model of MEK5 was constructed. Based on the homology model, previous SAR knowledge, and our medicinal chemistry intuition novel thiophene analogs were developed as selective allosteric inhibitors of MEK5. The design, synthesis, and biological activity will be presented.

88 Self Reflection Tool for Psychology Teachers
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Today's society continues to become more diverse with 41.5% identifying as ethnically diverse (U.S. Census Bureau, 2017). Nevertheless, as of 2017, the professional psychology does not reflect the general population comprised of reported 85 percent white, non-Hispanic individuals (American Psychological Association, 2018). This vast underrepresentation in the field in general and in the psychology teacher profession in specific results in learning environments that lack important cultural competences and diverse role models. Culture is something that is infused in one’s personal and social understandings of the world that deeply impacts an individual’s experiences in society (Yasui, Pottick, & Chen, 2017). In order to become culturally aware, teachers must first understand their own biases. To contribute to this goal, the Considering Diversity: A Self-Reflection Tool for Psychology Teachers was created for teachers to gain insight into their own beliefs, feelings, and actions towards diverse populations. The questionnaire measures the construct ‘awareness of diversity issues in the classroom' which is comprised of four dimensional factors: 1) high school teacher's personal perceptions, 2) high school teachers' perceptions about students and their classroom, 3) high school teachers' perceptions about their curriculum & instruction, and 4) high school teachers' perceptions about their school. To provide validity evidence for the questionnaire, confirmatory factor analysis was conducted to determine if resultant factors matched questionnaire dimensions previously identified by expert review. Factor analysis is a reductive statistical technique that uses intercorrelations among items to identify item clusters that together represent a dimension (or factor) of the overall questionnaire. The Considering Diversity questionnaire has 22 items. In a national data set of 91 high-school psychology teachers, results suggested a 4-factor model was most appropriate and largely reflected the dimensions identified by experts. Results provide supportive evidence for the Considering Diversity questionnaire's construct validity. This is an important finding for using the questionnaire in applied secondary school settings.
Calciphylaxis is an uncommon syndrome of vascular calcifications that can lead to painful, ischemic skin lesions. The condition is most commonly seen in those who have end-stage renal disease. There are currently no approved therapies for calciphylaxis, thus contributing to the survival rate of typically less than one year after diagnosis. Historically, surgery has not been a favored treatment for these patients, as surgical stress can result in increased excitation of the sympathetic nervous system causing a disruption in circulation and widespread necrosis. Although surgical intervention was previously thought to cause more harm than good, recent results support the opposite. The most common surgical intervention is excisional debridement of nonviable and necrotic tissue, followed by coverage of the open wounds. We present a case of a 45 year-old female with chronic kidney disease and a BMI of 42.8 who presented with excruciatingly painful necrotic wounds on bilateral legs covering 15% total body surface area. The diagnosis of calciphylaxis was made via excisional biopsy and treatment was focused on surgical intervention and pain management.

Severe Reaction to Carboplatin After Twelve Cycles of Chemotherapy
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Advanced cancer patients face many unknown challenges including multiple drug interactions between cycles of treatment with chemotherapy. Practitioners often focus on the common side effects of chemotherapeutic agents. Mild hypersensitivity reactions are common amongst chemotherapy drugs. Life-threatening reactions are also possible but rare. After a number of cycles of chemotherapy, most patients are at risk for severe adverse reactions. In this case report, we describe the clinical presentation, and management of an 83-year-old white female who developed severe hypotension a few minutes into her twelfth cycle of carboplatin; without prior adverse reactions to chemotherapy for metastatic adenocarcinoma of the ovaries.

Shared Decision Making and Use of Decision Aids in Multiple Sclerosis
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Objectives: Decision aids (DAs) are used to facilitate patient participation and help make informed therapeutic decisions. With an ever-increasing number of treatments available for patients with multiple sclerosis (MS), there is a need to understand the effect of shared decision-making (SDM) between patients and neurologists. The study objectives were to conduct a systematic review to identify DAs utilized in MS and explore their impact on SDM.

Methods: A systematic literature review was conducted utilizing the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The search identified English-language
articles from PubMed, CINAHL, and PsycINFO databases. Review articles, thesis/dissertations, editorials, case studies, pediatric studies, and studies including patients with cognitive impairment or disabilities were excluded from the review.

Results: A total of 53 articles were identified, of which 11 studies were accepted for review based on the inclusion/exclusion criteria. All but one study was conducted outside of the United States, with majority 8 (73%) conducted in Germany. Among the 11 studies, 6 studies (54%) focused on the use of DAs and assessed outcomes such as patient preferences, understanding, knowledge, and disease management. A variety of DA formats were utilized, including educational program (1; 16%), printed materials (3; 50%), graphic format (1; 16%), and a software program (1; 16%). The DA's utilized as printed material included a range of 6, 12, and 30 items each whereas the educational program was a 4-hour session. The web-based DA covered 3 domains and included figures demonstrating treatment effects and risks.

Conclusion: Although a variety of DAs have been identified in MS, a need for a robust tool exists. By inappropriately assuming the patient's scientific understanding, no current tool has extensively explored the patient's outlook towards different treatments. Currently, a tool including both the patient's willingness to participate and understanding of treatment options does not exist.

92 Solid-State Synthesis and Characterization of Novel Quaternary IR NLO Materials
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The discovery of new metal chalcogenides is of importance because these materials are desired for their semiconducting and optical properties, among others. New lithium and sulfur-containing compounds of a noncentrosymmetric space group and structure type were discovered. The stability and noncentrosymmetric structure of these materials seems very appealing as a fertile ground for the exploration of new chalcogenides with non-linear optical properties. Establishing a new class of materials will allow for the systematic study of physicochemical properties as a function of composition. In total, twenty new compounds have been discovered to date. Single crystal X-ray diffraction data were collected, solved, and refined for five of these compounds, while 15 other new compounds were identified based on X-ray powder diffraction data. Diffuse reflectance UV-Vis-NIR and differential thermal analysis data were collected to estimate optical bandgaps and assess thermal properties, respectively.

93 Somatosensory Retraining Deficits in Anterior Cruciate Ligament Reconstruction (ACLR) Rehabilitation
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Background: In the United States, 200,000 athletes injure their anterior cruciate ligaments (ACL) each year. The injury produces structural instability and disrupts function of mechanoreceptors requisite for sensation-based motor control. ACL surgery restores stability but cannot address proprioceptive impairments including diminished gamma-mediated support for muscle contraction. These neural
deficits of altered muscle inhibition are most severe during the acute stages of ACLR recovery. Altered quadriceps muscle activation, reduced spinally-mediated reflexive excitability and cortical drive to the quadriceps muscle may persist for months or years following ACLR. Because such quadriceps deficits are associated with cartilage degeneration, a predisposing factor for early onset of osteoarthritis, we analyzed existing rehabilitation protocol for the inclusion of proprioceptive rehabilitation following ACLR.

Methods: Forty published ACLR protocols were analyzed for the presence of proprioceptive-oriented interventions/goals. Protocols were included if they were published later than 2010, listed an author or source, involved an ACL replacement graft, and described each phase of rehabilitation. Protocols adhering to the conditions of the Clinical Test of Sensory Organization and Balance (CTSOB) were defined as addressing the proprioceptive issues of ACLR.

Results: 10/40 rehabilitation protocols included elements of the CTSOB. Although proprioception goals and interventions were listed in 36 and 29 protocols, respectively, only 19 started interventions in the acute phase, and only 17 continued for 12 or more weeks.

Conclusion: The proprioceptive sequela of ACL disruption/repair were addressed in the reviewed protocol. However, only 75% specifically included interventions for this confirmed dysfunction, a lower 48% began the interventions during the critical period of greatest proprioceptive deficit and only 25% followed a progression that adheres to the practice standard for CTSOB intervention. Although a direct comparison of programs that include CTSOB-compliant early intervention versus those that do not is not available, the prevailing physiological evidence suggests such research is in order.

94 South Fayette Township's Industrial Revolution
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In February 1978, green snow, resulting from a burst pipe, covered the area surrounding the Koppers Chemical plant, an incident that mirrored the industrial history of South Fayette Township. South Fayette's development deviates from the regional narrative, although its early industrial history parallels that of Western Pennsylvania. After the discovery of coal in the region, the mining and coking industries expanded, becoming significant employers. The companies offered housing for miners and their families. When the mines were eventually exhausted, workers left with their families to find employment elsewhere leading to the only decrease in population in the last 80 years. To increase local employment, South Fayette Township officials then brought in a new industry, a chemical plant. According to a former resident of South Fayette and employee of the plant, it was one of the, if not the biggest employer in the area. (Interview with Dan DeGrave) The chemical plant operated for over 70 years, especially during the tumultuous collapse of the steel industry. This combined with South Fayette's transition into a bedroom community, after the construction of Interstate 79, resulted in exponential growth. Large tracts of land, coupled with the development of a new interstate, attracted new residents to the township. This project examines how these specific instances influenced the growth of the township and its population. Using census data in conjunction with the history of the township, this project creates a full picture of the changes to South Fayette Township's economy and population, and how it diverged from the regional story. The information extracted from this project can...
help in future policy decisions, especially when it comes to the environmental impact of the past industry. Other locales can use this framework to establish how to move forward.

95 Splice Site Variant of COL1A1 causing Osteogenesis Imperfecta
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Osteogenesis Imperfecta is a group of heritable disorders that affect Type I collagen causing abnormalities of connective tissue. This leads to decreased bone mineral density and increased fractures. Other extraskeletal manifestations include dental hypoplasia, blue-gray sclerae, hearing loss, and valvular diseases. OI could be perinatally fatal, however, subtypes range from mild to severe. One classification system widely accepted is the revised Sillence system, based on observed clinical features, inheritance patterns, and genetics. We present a case of a one-day-old infant with Osteogenesis Imperfecta, and a genetic mutation of the COL1A1 gene that has not been previously published. The patient inherited the genetic mutation from his mother, and her clinical findings served as the basis for classifying this mutation into one of the subtypes of OI. The classification of the disorder is pivotal to the treatment recommendations, as well as prediction of prognosis in patients.

96 Surgical Management and Follow-Up of a Complicated VSD
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Faculty Advisor: Afokoghene Okpozo, M.B.B.S, Ph.D.

Ventricular septal defects (VSDs) are the most common congenital heart defect found in children. Four subtypes exist, with the most common being membranous VSD, comprising 75-80% of all defects. These can extend into the inlet or muscle septum, which leads to complications related to the aortic and tricuspid valves. In addition, VSD sometimes results in significant dilation of the heart chambers, left-right shunting, and pulmonary hypertension. Its surgical management varies depending on the size of the defect, the presence of other heart defects, and the current status of the child. Subsequent follow-up should be carried out in all patients due to the increased incidence of cardiac and pulmonary dysfunction. We present a case of a male infant born at 37 weeks gestation due to intrauterine growth restriction who had a murmur on physical examination. Subsequent testings showed VSD along with numerous concomitant heart defects, including a patent foramen ovale and ductus arteriosus. He underwent open-heart surgery at six months to repair the defects, at which time he also exhibited tricuspid valve regurgitation and pulmonary hypertension.

97 Surgical Management of Lipoma Removal in Dercum's Disease
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The rarity of Dercum’s disease presents an interesting and little-known topic. There is limited amount of information regarding the clinical presentation, epidemiology, etiology or first line treatment of this disorder. More research regarding this condition can help further this knowledge. This case reports a 62-
year-old female who presents for surgical management of Dercum's disease. She reports having the lipomas on her body for her whole life but was recently diagnosed with Dercum's disease. She reports to the office because she wants to have the painful masses on her back and arm removed. After excision of these lipomas she has relief of the pain. She has similar symptoms to two other patients described in literature that were diagnosed with Dercum's disease. By reporting cases of Dercum's disease, more information about it can be studied and described.

98 Sustainable Business Practices in Food Establishments
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The hospitality industry, comprising lodging, food establishments, theme parks, travel, and tourism among others, greatly impacts the economic productivity of cities and states. In the United States of America, consumer spending for 2018 at food establishments approached $740 billion. Given that the food service market is fiercely competitive, what can food establishments do to gain an edge? One potential area for exploration, especially given recent pressure from consumers, is social responsibility in product design, supply chain, sourcing, and operations. Exploring social responsibility in this industry may be an impactful area given the industry has historically been deficient in regard to economic, social, and environmental issues, such as food waste, poor working conditions, and high-water usage. To shed light on this, this study seeks to identify how food establishments can gain a competitive advantage through the use of sustainable business practices (SBP). Through analyzing elements of sustainable food establishment certification programs as well as data collected directly from food establishments, we identify specific elements of SBP that impact consumer perception, employee buy-in, and financial outcomes. These elements may become key factors in determining the viability of and economic return on the implementation of SBP in the food establishment industry, narrowing the spectrum of potential avenues business can take in their sustainability endeavor, making SBP more tangible and easier to execute. We bring to light the financial and social impacts that SBP have not only for the individual food establishment, but for society as a whole.

99 Sustained Analgesic and Anti-inflammatory Efficacy of Single Dose COX-2 Inhibiting Nanomedicine in a Murine Inflammatory Pain Model
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Following nerve injury, local infiltration of immune cells (macrophages/monocytes) leads to upregulation of pro-inflammatory mediators (chemokines, cytokines, prostaglandins), neuronal sensitization and pain. The widespread prevalence of pain is estimated to cost the US economy an estimated $650 billion annually (Institute of Medicine 2011). Though highly effective, opioid analgesics pose a high risk for abuse, addiction, tolerance and accidental overdose (M. Hale 2016). The effectiveness of systemic non-opioid analgesic strategies like non-steroidal anti-inflammatory drugs (NSAIDs) and selective cyclooxygenase-2 (COX-2) inhibitors, is often poor with adverse effects (such as cardiovascular and/or renal toxicity) (Derry and Moore 2012). Targeted cellular delivery to site/s of
chronic inflammation of NSAIDs with theranostic nanomedicine is presented. In previous studies we demonstrated that anti-inflammatory nanoparticles formulated as nanoemulsions carrying Celecoxib (CXB/NE) are internalized by macrophages and reduce macrophage infiltration in the CFA-treated mouse footpads (Patel et al, Clin.Imm. 2015). Observed reduction of CFA induced inflammation was achieved with celecoxib dose reduced more than 100 fold as compared to other studies in the same model. In this study, we present novel high dose celecoxib theranostic nanoparticles designed with an extended drug release profile (and extended anti-inflammatory/analgesic action) and tagged with a NIRF label to allow tracking of the nanoparticles. Mechanical allodynia studies in the CFA mouse model, whole body live imaging (WBI) and histological analyses confirming prolonged analgesic effects (up to 40 days) of single dose, targeted CXB/NE treatment are presented. We also show new design of experiments (DOE) computational approaches to theranostic nanomedicine design that utilize multidimensional data (behavior and imaging) for optimal inflammatory pain relief. To the best of our knowledge, this is the first study confirming the anti-inflammatory and analgesic efficacy of a single-dose nanomedicine platform in an experimental CFA pain model.

100 Synthesis of Lanthanide-Doped Gahnite for Use in Fluorescent Detection of Gunshot Residue
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Gunshot residue (GSR) is microscopic and not readily visible at a crime scene. A fluorescent additive to gun powder would allow for a quick visualization of GSR during an investigation. An ideal powder additive would be lanthanide-doped gahnite (ZnAl2O4). Gahnite is a naturally occurring mineral with high thermal and chemical stability. The crystal structure of gahnite allows for doping of the mineral, by inserting a trace amount of a different element into the host compound. The literature reveals the capability of different lanthanides to be doped into synthetic gahnite with the plus three oxidation state being the most intensely fluorescent. This was achieved by heating stoichiometric mixtures in a programmable furnace capable of solid state synthesis, with the target formula of ZnAl2-x(III)xO4. Co-doping lanthanides was also investigated. Pairing of different elements results in a donator-energizer relationship. Through the transfer of electrons, this relationship increases intensity. Ratios were optimized for maximum fluorescence. Samples were analyzed using X-ray powder diffraction (XRPD) and single crystal X-ray diffraction to confirm crystal structure. X-ray photoelectron spectroscopy (XPS) along with energy dispersive X-ray spectroscopy (EDS) were used to confirm the amount of dopant in the final product. The goal of alternate light source trials was to assess practicality when viewed alongside other fluorescent evidence at a crime scene (e.q. blood, semen, saliva). These emitted wavelengths were avoided during selection and lower energy wavelengths (red, orange, yellow) were preferred. Future studies will consist of using trace amounts of the synthesized powder for use in ammunition to determine the effects of the additive to trajectory, velocity and accuracy.

101 Synthesis, Structural and Physicochemical Characterization of Quaternary Lithium Sulfides with Potential in Nonlinear Optics
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The discovery of new, infrared nonlinear optical (NLO) materials is paramount for furthering the development as well as enhancing a number of important technologies. Infrared NLO materials are used in areas of great importance, such as military infrared countermeasure systems and the remote detection of explosives. These materials also have potential applications within the medical field in areas such as the diagnostics and monitoring of disease states as well as advancements in laser surgery. Lithium sulfides are ideal candidate infrared NLO materials due to their high transparency within the infrared region in addition to possessing wider bandgaps. These wide bandgaps tend to favor large laser-induced damage thresholds (LIDTs), which are essential for high-powered laser systems. Some quaternary lithium sulfides have demonstrated exceptional LIDTs, while still maintaining a strong second harmonic generation (SHG) response. SHG is an NLO phenomenon that arises as a result of the material possessing a noncentrosymmetric structure. Recent investigations into these types of materials have led to the serendipitous discovery of two new quaternary lithium sulfides. These two compounds have been synthesized via high-temperature, solid-state methods, had their structures solved and phase purity assessed using X-ray diffraction techniques. Additionally, physicochemical properties such as optical bandgap, the electronic structure, and SHG response have also been investigated.

102 Takotsubo Cardiomyopathy Caused by Sepsis
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Takotsubo cardiomyopathy, also known as stress cardiomyopathy or broken-heart syndrome, is a condition in which the heart experiences left ventricular dysfunction. Major complications of Takotsubo cardiomyopathy include cardiac arrest, cardiogenic shock, pulmonary edema, and even cardiac rupture leading to death. Takotsubo cardiomyopathy is unique as its presentation is often indistinguishable from a myocardial infarction. Therefore, the use of echocardiogram, ventriculography, and angiography is important to make a proper diagnosis. Upon ventriculography and angiography, the left ventricle will show apical ballooning and the coronary arteries will be patent without any signs of stenosis. We present a case of a 59 year old white female who initially presents to the emergency room with chest pain, ST segment elevations on electrocardiogram, and troponin elevations. After completing an extensive workup, we found that the patient developed sepsis due to a gastric perforation. Later, the patient was diagnosed with Takotsubo cardiomyopathy secondary to the development of sepsis.

103 Technology Integration for TESOL Instructors: Combining TPCK and SAMR to Support Comprehensible Input
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Comprehensible input is a term coined by Dr. Steven Krashen in 1989. It refers to the concept that receptive language (e.g. listening and reading) cannot be acquired if it is not comprehensible to the interlocutor. The Multimedia Principle, coined by Mayer in 2010, refers to the overarching finding in
research that content presented with language and pictures is more comprehensible than learning with language alone. Therefore, we can speculate that, there is a direct connection between comprehensible input and the use of multimedia to support English Learners (ELs). Unfortunately, most pre-service teachers report low self-efficacy in the use of technology in their classrooms due to a “lack of integrated content courses with technology, negative models of teacher educators, and no adequate exposure to technology rich classrooms.” (Banjeree, Xu, Xiang, Waxman, 2017, p. 92). This paper will propose research to integrate Technological Knowledge, following the Technological, Pedagogical and Content Knowledge (TPCK) model, through the lens of the Substitution, Augmentation, Redefinition, and Redefinition (SAMR) framework to further support the comprehensible input hypothesis in support of English Learners (Krashen, 1989, Mishra, Koehler, 2006 & Puentesdura, 2014). The two research questions that will be addressed in this qualitative study are: What beliefs do teachers have about using technology to support comprehensible input for ELs prior to professional development in TPCK? How have the teacher’s beliefs about using technology to support comprehensible input for ELs changed after the professional development in TPCK? Suggestions for future research - following the findings from this qualitative investigation of teacher beliefs - will be discussed.

104 The acyltransferase Gpc1 impacts PC molecular species and phenotypic outcomes
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Phospholipids are major components of cellular membranes and their biochemical properties, such as fatty acid composition, help define the biophysical properties of membranes. Phosphatidylycercholine (PC) is the most abundant phospholipid in cellular membranes and is synthesized primarily by two well defined metabolic pathways in Saccharomyces cerevisiae. Our laboratory recently characterized a novel glycerophosphocholine (GPC) acyltransferase, encoded by GPC1, that provides a third route for PC biosynthesis and is involved in the newly defined PC deacylation-reacylation remodeling pathway (PC-DRP). PC-DRP begins with GPC, the product of complete PC deacylation by phospholipases of the B type. Gpc1 acylates GPC to form lysophosphatidylcholine (LysoPC). LysoPC can subsequently be converted to PC by Ale1. Previous results have shown that Gpc1 prefers the addition of saturated fatty acids during PC remodeling, which results in more saturated PC species and has the potential to influence the biophysical properties of the membrane. To better understand how GPC1 is regulated and to determine its physiological role in the cell, we assessed the effect of GPC1 dosage and temperature alterations on growth, expression, and PC molecular species. Preliminary data indicates that while increasing the temperature from 30°C to 37°C slows growth in a wild type strain, the gpc1∆ mutant is much less affected. As expected, overexpression of GPC1 further negatively impacts growth at 37°C. GPC1 message abundance, as measured by qRT-PCR, is decreased at 37°C as compared to 30°C in a wild type strain. Other members of PC-DRP, including ALE1 and PLB1 also display decreased expression upon elevated temperature. Mass spectrometry-based analysis of the PC molecular species under these conditions are ongoing. Other stressors expected to impact membrane events, including inositol availability, are being examined. These experiments will provide insight into the physiological role of Gpc1.
The adult immune response controls viral infection in the brain and induces neural stem cell activity post-infection
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Neural stem/progenitor cell (NSPC) activity is altered by viral infections in the central nervous system (CNS). Although disruptions in NSPC activity are associated with disorders like epilepsy and cognitive dysfunction, the mechanisms by which viral infections disrupt NSPC activity are undefined. Our previous work has demonstrated that neonatal NSPCs were protected by the anti-viral cytokine, interferon gamma (IFNg) during a viral CNS infection. However, we were unable to study the long-term impact of the infection on NSPCs as neonatal mice succumbed to the virus. Thus, we examined the effects of IFNg on adult NSPCs in vitro and in vivo, as adult mice survive the infection long-term. To determine how IFNg directly modulates NPSC activity, we harvested subventricular zone NSPCs from adult mice and treated them in vitro with IFNg. IFNg reduced NSPC growth while inducing expression of transcription factors associated with pluripotency. To test whether IFNγ exerted similar effects during an active infection in vivo, we utilized a mouse model of neuron-restricted measles virus (MV) infection, which enables us to selectively infect mature neurons only and spare the NSPCs from infection. Hippocampi from MV-infected adult mice were analyzed by flow cytometry at 7, 21, and 60 days post-infection (dpi). NSPCs and immature neurons were increased in the hippocampi of adult mice after the infection had resolved (60dpi). In mice lacking IFNg, there was an increase in NSPCs at 21 and 60 dpi, and an increase in the immature neuron population at 21 dpi only. Thus, although IFNγ alone exerts an anti-proliferative effect on NSPCs in vitro, IFNg is associated with successful resolution of the virus and potential neural repair in the hippocampus of adult mice. In adult mice lacking IFNg, viral control is not achieved in the brain, and thus the attempts at repair are potentially initiated earlier during infection.

The Clinical Manifestations and Management of Stiff Person Syndrome
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Stiff person syndrome is an extremely rare disorder that annually affects one in a million people worldwide. This condition causes diffuse painful muscle spasms and rigidity, progressive stiffness, and significantly impairs ambulation and ability to perform daily activities. The cause of this condition is unknown, although it is believed to have an autoimmune aspect to its development. Diagnosis of this condition is primarily based on symptoms, comprehensive history from the patient, and a physical evaluation. We present a 22-year-old white female diagnosed with stiff person syndrome, who has lived with the debilitating effects of this condition since she was diagnosed at the age of 16 years. Currently, there is no definitive treatment or cure for this condition. Instead, treatment is targeted towards minimizing the patient's symptoms and to improve the overall quality of life as much as possible.

The Comparison of MtDNA Control Region Haplotypes between Individuals of Known Maternal Lineage and Ancient Skeletal Remains from the Flevaeis Plot Archaeological Site in Rhodes
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When human skeletal remains are found at a crime scene or archaeological site, DNA analysis can be utilized to distinguish between individuals as well as determine identifying characteristics. In the case of the Flevaeis Plot archaeological site in Rhodes, two graves were uncovered each containing six to seven skeletons. By utilizing the contextual information of the site, the bones are estimated to be 1,368 to 2,341 years old. With Rhodes' tumultuous history and occupation by many different peoples, this indicates the potential for maternal lineages from several different cultures to be within the skeletal remains, namely those of Greek, Roman, Mediterranean, Persian, and Arab descent.

This project utilized hypervariable region I (HVI) sequences from studies of contemporary populations of the ethnic groups indicated above as a reference. The HVI was sequenced from Flevaeis Plot Bone 5D and was compared to the revised Cambridge Reference Sequence (rCRS) haplotypes in Mega X to determine whether there was sufficient sequence similarity with variants from known populations to infer the maternal lineage of Bone 5D. All sequences were aligned, and the best scoring phylogenies were reconstructed using maximum likelihood.

A comparison of substitutions within the HVI sequences of Bone 5D and the known populations indicate potential origin in Italian, Iraqi, and Cyprian ethnic groups based on sharing T16271C and T16311C mutations. In addition, the position of Bone 5D in the phylogenetic tree indicates shared ancestry with individuals of the Iraqi populations. The shared ancestry could be a result of Persian forces that occupied Rhodes in the 5th century BCE as well as Persian and/or Arab populations that occupied Rhodes in the 7th century CE. As HVI consists of only ~450 base pairs, analysis of additional regions within the mitogenome would need to be performed in order to validate this hypothesis.

108 The Effect of a Visual Communication Partner on Beat Gesture Production
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Gestures are an essential aspect of communication. Though there is growing interest in the study of gestures, the effect of the speaking environment on gesture production is relatively understudied. The amount of semantic (meaningful) information presented in a gesture determines its classification. Representational gestures depict spoken language visually (i.e. flapping hands when describing a bird flying) and therefore present information that can extend or enhance the verbal message. Beat gestures are short flicks or pulses of the hand and present no meaningful information to the listener and are understood to mark the rhythm of ongoing speech. Therefore, it is often concluded that the immediate benefit of beat gestures is for the speaker, rather than the listener. In this preliminary study, beat gestures are expected to be more prevalent in speaking tasks where a visible communication partner is not present. Furthermore, because of the increased use of beat gestures, total overall gesture use is expected to increase in tasks with no visible communication partner.

Eight neurotypical adults completed a video narration task with two short animated films and engaged in two brief conversations with the examiner. The presence or absence of a screen to block the view of the listener was counterbalanced across tasks and participants. The type and frequency of gestures, the
Preliminary results suggest an increase in gesture use and a higher ratio of beat gestures to all other gestures during tasks with no visible listener. This suggests an increased benefit of nonmeaningful gestures for the speaker, while also highlighting a function of meaningful gestures in the absence of a visual listener. Future studies are planned to address the development of these changes as a function of age.

109 The Effect of the Home Language Environment on Speech Sound Development
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Speech sound disorders (SSDs) affect approximately 3% - 6% of all 4 to 6 year old children, with 50% - 75% experiencing later academic difficulties. While genetics accounts for part of a child's speech and language development, research highlights the critical role played by the amount of language the parent speaks to the child (called parent-talk) and the number of parent-child interactions during early childhood development. The purpose of this study is to compare the home language environment between children with SSD and children with typically developing (TD) speech to determine whether the frequency of parent-talk and parent-child interactions is different. Participants consisted of two groups: TD (n = 8; male = 4, female = 4) and SSD (n = 9; male = 7, female = 2). Children were between 3-5 years old, monolingual speakers of American English, with no evidence or history of any syndrome, hearing loss, cleft palate, cognitive delay, language delay, or other comorbid language or speech disorder. The procedures consisted of three components: a speech-language evaluation, a recording of the child's home language environment using a LENA device, and a parent survey. The LENA device is a digital language processor that automatically processes the frequency of parent-talk and parent-child verbal interactions across the day, which participants wore in a special pocketed shirt for a 10-hour period. The parent survey consisted of 12 online questions that measured parent perceptions of speech, language, and literacy development. Results of the study indicate that the home language environment of children with SSD is similar to that of TD children in terms of the frequency of parent-talk and parent-child interactions. Data from the LENA device indicated that adult words per minute, child vocalizations per minute, and child conversational turns per minute were comparable in the SSD and TD groups.

110 The Ethical implications of Big Data in Healthcare
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Faculty Advisor: Gerard Magill, Ph.D.

This paper aims to address the ethical implications of Big Data in healthcare. As a result of the continuous evolving innovations and transformations of the web technologies, mobiles and sensing devices and other technologies; massive amounts of data are being created and produced daily at an extraordinary rate. Traditional technical methods are struggling in operating and saving processes when faced with such an extensive amount of information. Hence, the concept of Big Data has created a revolution that promises not only to solve those issues but to change how human's lives on every single
accept of life. Big Data ensures resolving the issue of preserving the unlimited amounts of data like no other traditional database could. This inelegant analytical technology has the potential to facilitate the optimization of any process while empowering insight discoveries to improve the course of decision making. Accordingly, that can be achieved through the use of algorithms that extracts values from the massive amounts of data. This is machine learning at its core. Traditional machine learning methodologies were based on multiple conventions where data is expected to fit into memory to complete a process which is difficult for the meantime and impossible in the near future. However, the significant practicalities and approaches of Big Data come with a whole big package of challenges and ethical matters such as the privacy issue. And when considering what Big Data should offer to the healthcare sector and biomedical research field; privacy issues become profound and more sensitive due to the presence of the genetic element. This necessitates a closer study of the ethical aspects and challenges that are ahead of Big Data in the healthcare context. Henceforward, the privacy concerns prevail as the most distressing moral issue related to the utilization of Big Data technologies in the healthcare sector. Moreover, and since Big Data is an industrial technology, it would serve healthcare insurance companies more than other healthcare parties. However, this demands to tackle the privacy issues that seem to be individually unique within the healthcare insurance business in the era of Big Data.  

*111 The Ethical Implications of Using Living Kidney Donation to Address the Kidney Shortage*

Hillary Villarreal

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There is an increasing gap between the number of patients needing a kidney transplant and the number of kidneys available. New methods of transplantation (such as living donor kidney transplantation) have developed, and sources of kidneys have expanded in attempts to address this shortage. The practice of living kidney donation is a crucial component of addressing the kidney shortage; an understanding of the complexity of stakeholder relationships and the relevant ethical implications surrounding living donor kidney transplantation is pertinent to it’s ethical practice. Addressing the kidney shortage is crucial to resolving ethical challenges including increasing access to kidney transplantation, reducing health inequities, and preventing global problems. The practice of living kidney transplantation is a complex ethical issue that involves different stakeholders (recipients, donors, and surgeons) who are impacted by the morally significant advantages and disadvantages of the practice. There are three types of living kidney donors: genetically related, emotionally related, and non-related strangers. Ethical principles such as autonomy, justice, beneficence, and non-maleficence are crucial to understanding the unique ethical implications of living kidney donation for stakeholders. Before implementing a living kidney donation model, it is important to consider the ethical ramifications of directed and non-directed kidney donation, as well as simultaneous and non-simultaneous transplant practices. Furthermore, much thought should be given as to whether kidney donation models should remain altruistic or allow for reimbursement, non-financial awards, and commercialization. Living donor kidney transplantation can be performed in an ethical manner when it involves a robust informed consent process, there is adequate access to medical care post-transplantation, and a kidney paired donation method is employed. Finally, even when living kidney donor transplantation is conducted ethically, some problems remain regarding conflicts of interest, the recruitment of donors, and the elimination of excuses.
The Feasibility of a Mini-Study Using Ethnonursing Methodology to Understand the Experiences, Values, and Beliefs of Spanish Speaking Parents Whose Children Are Hospitalized
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Additional Authors: Rick Zoucha, PhD, PMHCNS-BC, CTN-A, FAAN

The purpose of this mini-study was to understand the cultural values, experiences, and beliefs of Spanish speaking, limited English proficient (LEP) parents of Mexican origin, whose children were hospitalized. Secondary aims were to determine feasibility of conducting a maxi-study and refine research questions and interview guide. Parent-provider language mismatch creates challenges and may affect care of the hospitalized child. A review of literature indicated an association of LEP and several aspects of home, primary, and tertiary care. Research is lacking regarding the Spanish speaking, LEP parents' perspectives, concerns, and needs when their child is hospitalized. Research questions: "What are the cultural values, experiences, and beliefs of Spanish speaking parents of Mexican origin who speak little to no English whose children are hospitalized?" and "What is the role of the nurse in promoting family-centered care?" The ethnonursing method was utilized to discover nursing phenomena in the context of culture. The Theory of Culture Care guided the study. Data was analyzed using Leininger's four phases of qualitative data analysis. Three mothers and one father were interviewed in their homes with the assistance of an interpreter of Mexican origin. Two preliminary patterns emerged: belief in God when situations were out of the parents' control and needing to know at all times what is happening to their hospitalized child. Implications for future research included that contact with an initial gatekeeper was insufficient for recruitment of informants. Collaboration with a local priest of Mexican origin proved beneficial for recruitment. A large-scale study is needed to identify categories, patterns, and major themes. Working with a trusted gatekeeper from the community will be key for recruitment. Future research will increase understanding of Spanish speaking, LEP parents' needs and care concerns, promote culturally congruent care, and support positive nurse-parent relationships, communication, and parental engagement.

The People of Genocide: A Comparative Study of Rwandan Post-Colonial Political Speech as a Path to Understand the Violence of the Rwandan Genocide
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Faculty Advisor: Robin Chapdelaine, Ph.D.

During the 1994 genocide in the small central African nation of Rwanda, the Hutu social majority collectively targeted the Tutsi minority. The brutal attacks killed 7 in 10 Tutsi, not including surviving injuries sustained in other genocidal attacks (e.g. sexual assault). Studying the genocide, the civil war before it, and the refuge crisis after it requires looking at Hutu and Tutsi as large groups to simplify studying them as actors. However, studying the Hutu and Tutsi as groups not only ignores their individual reason for engaging in intense violence but also glosses over previous cultural events that shaped their worldview and behavior. Therefore, to challenge this traditional narrative, this research analyzes the founding manifestoes of the extreme Hutu and Tutsi political parties to ask how they viewed both themselves and their political opposition. Understanding each group's identity enables a more nuanced understanding of how these views factored into future violent actions. Looking at these...
groups as individual actors then empowers deeper understanding. This comparative analysis research is anticipated to conclude that Belgian colonial powers significantly inspired the vehement dialogue between the Hutu and Tutsi but will also show that Rwandans chose to accept and retain the colonial influence and that this dialogue cemented the Hutu and Tutsi as political groups that were then carried through decolonization in 1962. Understanding the deeper origins and outcomes of the Hutu and Tutsi political divisions challenges the narratives that colonialism destroyed Rwandan society or that tribal warfare was an inherent aspect of African culture. Instead, studying the rhetoric of Rwanda's own self-organized political groups provides an opportunity to understand them through their own agency, not as a mere outcome of European colonialism. More broadly, this study could help understand how political groups engage in violence, especially when applied to atrocity studies.

114 The Relationship between Cognitive Skills and Motor Skills in Infants with Movement Disorders: a Case Series
Karl Jancart, Jaclynn Stankus, Mihee An, Regina Harbourne
School Psychology/PT | School of Education, Rangos School of Health Sciences
Faculty Advisor: Regina Harbourne, Ph.D/PT

Early in development, infant movement allows exploration and manipulation of objects, which builds cognition. Object permanence as a cognitive skill relates to motor skill in several ways. Independent mobility in developing children closely correlates with the emergence of object permanence, which is the understanding that objects exist even when they are not directly visible. Sitting postural control links to some very early behaviors of object understanding and cognition. However, these relationships have not been shown in children with neuromotor dysfunction. In this study, which is part of a larger early intervention study, three cases are presented which explore the relationship of cognition and motor control by examining change on a test of object permanence over 12 months, as sitting skills advanced. The three cases representing infants with three levels of motor disorder severity (mild, moderate and severe) show the changing relationship over time in a cognitive skill related to changing motor abilities. Overall, infants with continued difficulty achieving independence in sitting showed slower change in the cognitive measure, and infants who became independent in sitting advanced to the top scores in the object permanence cognitive measure. Early motor skill development such as sitting may have an impact on the emergence of object permanence in young infants.

115 The role of MEK1/2 and MEK5 on melatonin-mediated effects on bone microarchitecture, mechanical strength, osteogenic and metabolic protein expression in intact female Balb(c) mice.
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Melatonin exposure has been shown to increase bone mineral density (BMD) in intact female mice equal in efficacy to a one-year exposure to an estrogen/progesterone hormone therapy. In the Melatonin Osteoporosis Prevention Study (MOPS; NCT01152580), melatonin (3mg, p.o. nightly for 6 mos) renormalized bone marker turnover in perimenopausal women. In the MelaOst (NCT01690000) and MOTS (NCT01870115) RCTs, melatonin (3mg for MelaOst or 5mg for MOTS, p.o. nightly for one year) alone (MelaOst) or in combination with strontium citrate, vitamin K2 and vitamin D3 (MOTS)
increased BMD in postmenopausal osteopenic women. Using a human bone marrow-derived mesenchymal stem cell (hMSC) and peripheral blood monocyte (hMC) co-culture model system, we have demonstrated that MT2 melatonin receptors, MEK1/2, MEK5 and perhaps PPAR and GLUT4 underlie melatonin's stimulating effects on osteoblast differentiation, which results in osteoprotegerin-mediated inhibition of osteoclastogenesis. We wanted to further these findings in vivo using intact female Balb(c) mice. Specifically, mice were injected with melatonin (0.166mg/kg) in the absence or presence of the selective MEK1/2 inhibitor, PD184352 (25mg/kg), MEK5 inhibitor, Bix02189 (25mg/kg), or the dual MEK1/2 and MEK5 inhibitor, SC-1-151 (25mg/kg) for 45 days. We assessed the effect of these treatments on osteogenic and metabolic protein expression in femur bone by western blot; bone microarchitecture through microCT; and bone biomechanics by the mediolateral three-point bending test. Melatonin, through MEK1/2 or MEK5, increased the expression of Runx2, Bmp-2, Fra-1 and decreased Ppar expression. Furthermore, melatonin in combination with Bix02189 modulated bone microarchitecture by decreasing trabecular number and connectivity density and by increasing trabecular separation. Melatonin in combination with SC-1-151 decreased ultimate breaking load of the femur bone. These in vivo studies support the findings in the hMSC:hMC co-culture model system and lend further support for a role of MEK1/2 and MEK5 in melatonin effects on bone.

116 Thorpe Ingold effect promoted cyclization to form pharmaceutically relevant lactones
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Additional Authors: Carolynne L. Ricardo, Venkata S. Pakkala, Jeffrey D. Evanseck, Tomislav Pintauer

Cascade atom transfer radical cyclization (cATRC) is an effective tool to form a cyclized product through a diene and alkyl halide. Forming $\gamma$-lactams from 1,6-diene amides using cATRC is well established, but reactions using esters to synthesize $\gamma$-lactones, which are found in pharmaceuticals ranging from antibiotics to anticancer drugs, have not been well studied. Seven sample substrates were studied with varying levels of substitution to study their effects on cyclization. Experimental results indicate that only two of the substrates (5 and 6) successfully formed the subsequent gamma-lactone, while all others did not. The reaction pathways were investigated computationally using density functional theory with the M06-2X/jul-cc-pvtz level of theory with the polarizable continuum model to represent the dielectric constant of methanol. It was found that the mechanism progresses in two steps: a Z to E conformational change followed by a 5-exo-trig cyclization. In all cases, the cyclization was the largest barrier. Substrates 5 and 6 had the lowest activation enthalpies for both the conformational change and cyclization barrier. However, substrate 3 was only 1.3 kcal/mol higher, which would indicate there should have been some lactone formation. Studies are looking into the mechanism of hydrogen atom transfer to explain the lack of cyclization for substrate 3. Studies show that the reason why 5 and 6 cyclized likely has to do with the Thorpe Ingold effect lowering the barrier for cyclization. This knowledge can be used to help promote the formation of gamma-lactones for pharmaceutical targets.

117 Transcatheter aortic valve replacement (TAVR) in intermediate risk patients
Sarah McNerney
Physician Assistant Studies | Rangos School of Health Sciences
Faculty Advisor: Kristin D'Acunto, PA-C
Aortic stenosis is the most common heart murmur in the US. Severe aortic stenosis can be a devastating diagnosis with a mortality of 50% for unresolved cases. Traditionally, the only treatment has been a surgical aortic valve replacement (SAVR) operation. As this operation is an open heart surgery, more than 30% of patients with this condition are deemed inoperable. In recent years, a new procedure has been introduced known as transcatheter aortic valve replacement (TAVR). TAVR was originally only available to patients deemed inoperable according to the Society of Thoracic Surgeons (STS) score. This score, based off of patient risk factors and comorbidities, reflects 30 day post-op mortality. In August 2016, TAVR was approved for intermediate risk patients. This is a unique patient population in that these patients have the option between traditional SAVR and the newer TAVR procedure. We present a case of a 76 year old white male with an intermediate surgical risk who made the decision to have a TAVR instead of a SAVR. This case study follows his progress while highlighting the benefits of TAVR in intermediate risk patients.

118 Withdraw submission

119 Type I Chiari Malformation: Spontaneous Regression in a 29-Year-Old Female
Nina Ringelman
Physician Assistant Studies | Rangos School of Health Sciences
Faculty Advisor: Afokoghene Okpozo, Ph.D., MBBS

Type 1 Chiari malformation (CM) is a congenital condition, affecting both pediatric and adult patients, in which the cerebellar tonsils herniate through the foramen magnum. This impedes flow of cerebrospinal fluid (CSF), generating a variety of symptoms. Headache, neurological deficits and nausea are common clinical features in adults. Syringomyelia is often present. Current treatment of symptomatic patients involves surgical intervention to re-establish proper CSF flow. We present a case of a 29-year-old female with a past medical history of type I CM, without syringomyelia. Resolution of associated headaches, and spontaneous ascent of cerebellar tonsils were observed two and a half years after initial diagnosis with only conservative management. The natural history of CM, as well as the rare occurrence of spontaneous resolution in adults, is still poorly understood. Until more definitive research is available on these topics, conservative management should be a recommended treatment option for symptomatic patients with type I CM.

120 Understanding English Language Learners (ELLs) in Mainstream Secondary Classrooms: A Co-Teaching Approach
Deepa Bardoloi
Department of Instruction and Leadership in Education | School of Education
Faculty Advisor: Xia Chao, Ph.D

This study is grounded in my student teaching experience at Brashear High School (Pittsburgh Public Schools) during the Fall semester of 2018. This study analyzes and synthesizes current research on co-teaching ELLs in secondary mainstream classrooms in the US. Through thematic analysis of the research literature, major findings include a large number of benefits for ELLs and their teachers in an inclusive mainstream content classroom. ELLs develop their English skills more substantially in authentic environments, and co-teachers enhance their teaching methodology through such a collaborative process. A number of studies have also focused on the challenges that exist in such classroom arrangements. From the ELLs perspective, there is a lack of institutional support for their learning needs,
and this impacts their ability to improve both language and content knowledge. As a result, ELLs develop anxiety from the pressures of being mainstreamed academically, linguistically, and culturally. To support ELLs, they must be seen as cultural and linguistic resources where educational institutions see bilingualism as beneficial, not a problem. Can educational co-teaching bridge the linguistic, academic and sociocultural gap between ELLs and native English speakers? This study has shown it is possible, but there needs to be further examination of academic strategies in the realm of ELLs in higher secondary education, especially in mainstream classrooms where co-teachers play a crucial role in effective learning.

121 Unexpected Carcinoid Tumor of the Colon in a Previously Healthy Adult Male
Jennifer Thomas
Physician Assistant Studies | Rangos School of Health Sciences
Faculty Advisor: Brenda Swanson-Biearmann, DNP, MPH, RN

Carcinoid tumors of the colon, classified as the uncontrolled growth of well-differentiated neuroendocrine cells, have increased in prevalence in the past 30 years. These tumors are commonly found incidentally because of the unspecific gastrointestinal symptoms they cause. These tumors are typically seen in patients of African American or Asian descent between the ages of 60 and 70 years. Our patient was a 41-year-old white male who presented with vague abdominal symptoms for several years that led to an exploratory laparotomy and the diagnosis of a T2N1 carcinoid tumor in the mid-jejunal portion of his colon.

The outcome of such a diagnosis is directly related to the metastasis, or spread, of the tumor and cancer cells. In this patient, 2 out of 17 lymph nodes tested were positive for evidence of cancer. Due to the detection and removal of this tumor before advanced metastasis, the patient’s prognosis was good. Early diagnosis and treatment are key as metastasis leads to a much poorer outcome.

As technology advances and imaging becomes standard practice, there becomes an opportunity to detect carcinoid tumors before malignancy. If certain populations, especially those without regular access to preventative healthcare, are targeted and screened, there is the chance that the rate of diagnosis will increase and the morbidity and mortality associated with carcinoid tumors will plateau or even decrease.

122 Using Cell-Free DNA to Improve STR Analysis of Sweat Samples
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Additional Authors: Benjamin Cooley, MS

Touch DNA (tDNA) samples in the forensic community are known to be difficult samples to obtain ample amount of template DNA and produce DNA profiles using STR analysis. Cell-free DNA (cfDNA) is DNA present outside the cell and found in bodily fluids such as sweat, saliva, and blood serum. Previous research has thought cfDNA could be used to enhance DNA profiles obtained from tDNA samples. However, they have not been conducted with a cell-free DNA extraction kit. In the first phase of this study, Qiagen extraction kits were used to extract DNA from blood serum samples. The two Qiagen kits used were the QIAmp DNA Mini Kit and the QIAmp Circulating Nucleic Acid Kit. The Circulating Nucleic
Acid Kit uses vacuum filtration through a silica membrane with different lysis and wash buffers than the DNA Mini Kit. DNA yields and STR profiles were compared between the two kits and confirmed the Circulating Nucleic Acid kit provided larger amounts of extracted DNA and improved profiles. In the second phase, sweat samples were collected on glass beads then extracted with the Circulating Nucleic Acid Kit and genotyped with Promega Fusion 6C to validate the use of cfDNA for forensic use. If cfDNA can be validated using sweat samples, cfDNA could be a key component in the genotyping of touch DNA samples.

**123 Utilizing Ovarian Tissue Cryopreservation for Post-Treatment Cancer Patients**

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Faculty Advisor: Afokoghene Okpozo, MBBS, Ph.D

Significant scientific advancement has been made over the past couple decades in regards to reproductive endocrinology. However, scientists recognize the lack of technology and critical data to identify protocols that maximize the utilization of cryopreserved ovarian tissue in status-post chemotherapeutic treatment patients. Over the years, scientists have steadily increased their live-birth rates utilizing in-vitro fertilization (IVF) procedures on harvested mature oocytes. Although there is substantial evidence supporting these IVF protocols, scientists are desperate for evidence optimizing ovarian tissue cryopreservation for fertility preservation and hormonal replacement. Despite the dual benefits of ovarian tissue cryopreservation, there is a paucity of research identifying optimal placement of ovarian tissue grafts status-post chemotherapeutic treatments to restore endocrine function for the prevention of medical menopause. Similarly, progress is still being made on the recognition of appropriate protocols to maximize the live-birth rate with isolated follicle and immature oocyte cryopreservation in comparison to live-birth rates of standardized IVF protocols. We present the case of a failed attempt of fertility preservation and ovarian tissue cryopreservation for the prevention of medical menopause secondary to the onset of hyperthermic intraperitoneal chemotherapy (HIPEC) in a 37-year-old white female.

**124 Variability of Dominance in Individuals of Different Age, Gender, and Education Based on Context**

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Additional Authors: David Delmonico Ph.D., Megan Overby Ph.D.

Perception is a part of our everyday lives, and we look at the people and situations around us to form our own conclusions. These perceptions are often based on our environmental and personal experiences, but as a result of this, they can often be wrong. A current example of this was the viral confrontation between the elderly Native American man and pro-life, "MAGA'hat wearing school student in Washington D.C., where many believed the young student was antagonizing the elderly Native American man. Before the longer video was released, people did not realize that the Native American man turned out to be antagonizing the student instead. With this knowledge, it shows how important understanding context can be to our perceptions, and through this understanding we can see how this is truly a big part of the criminal justice system. Police officers are often tasked with solving and diffusing situations although they may not have the full context, lawyers use context to convey
evidence, and juries make decisions based on the context of the crime. The goal of this study is to draw attention to how context can affect people's perceptions and allows us to become more aware of our own human nature. Participants were given an illustrated confrontational scenario between a man and a woman. Some received the scenario with a brief paragraph of context, while others received no context. Each group was asked to rate the man's dominance and explain their choice. It was found that the scenario without context had an average rating of 3.97, while the scenario with context had an average rating of 2.81. Participants without context often used physical descriptions and expressions of the characters, while participants with context often referred to the context more for their choice of rating.

125 Venlafaxine (Effexor)-Induced Mania
Christina Damico
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Faculty Advisor: Brenda Swanson-Biearman, Ph.D.

Depression and anxiety are two of the most commonly diagnosed behavioral healthy disorders. Due to their high prevalence, numerous medications are available to adjunct psychotherapy. The majority of these medications alter the neurotransmitters serotonin or norepinephrine or their receptors in a way that leads to an increase in circulating neurotransmitters, which is associated with an elevated mood. Venlafaxine (Effexor) inhibits the reuptake of both serotonin and norepinephrine, giving it a combined effect. As with any medication, there are potential side effects. However, it is primarily the most frequently observed adverse reactions that providers are aware of and subsequently that patients are educated about. The following case report describes the rare adverse reaction of mania in a patient previously controlled on venlafaxine and an unfortunate suicide attempt. The careful management of such patients will also be discussed.

*126 Back on the Map: Digitally Mapping Native American Presence in Pennsylvania and the Middle Colonies
Sophia Vayansky
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Faculty Advisor: John Mitcham, Ph.D.

Maps have been fundamental tools and symbols of colonialism for centuries. Europeans in colonial North America excluded or depicted Native American communities and borders on maps as the colonial governments saw fit, not as they actually existed. To support the narrative that the New World was an unsettled wilderness ripe for settlement, Europeans depicted areas not under their control as blank spaces on the map. At most, a cartographer might label a few major Indian towns; usually, if Native Americans appeared on maps at all, it was as a tribal name labeling a general area of land. In reality, Native infrastructure was so well developed and extensive it was the foundation for European roads and towns.

This problem was particularly prevalent in Pennsylvania, where Quakers and other Europeans adopted the “vanishing Indian” narrative quite early. The consequences of this erasure are still evident. Today, Pennsylvania is the only one of the original 13 colonies without a single Indian reservation or a federally or state recognized Native tribe or nation; yet, roughly 18,348 Pennsylvanians self-identified as Native American on the 2000 U.S. Census.*
To reveal Indians' long-ignored presence in Pennsylvania and the middle colonies, I am using digital history tools to map primary and secondary sources which describe Native American communities in Pennsylvania during the long Eighteenth Century. By consolidating these maps and layering them digitally, I aim to (1) identify previously unnamed "Indian Towns" in primary sources and (2) create a more complete visual representation of Native American Pennsylvania than has previously been available to scholars or the public.


*Dolls to Duchesses: The Doll's Influence on Queen Victoria's Monarchy*
Bethany Kaser
English | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Laura Engel, Ph.D.

In 1893, Frances Low published a text commissioned by Queen Victoria that recorded the monarch's collection of dolls. Queen Victoria's Dolls relates the myriad of dolls that she named, played with, and assigned famous personas to, thus offering a rich artifact displaying insight into the epitome of Victorian girlhoods. For the Victorian girl, a doll can provide a gateway to other worlds and an escape from the prescribed behaviors and play that are encouraged for Victorian girls. The doll may allow the girl to enact scenes from literature, imaginative play, or even to fulfill roles that the girl would rarely or never be allowed to take part in within real life. After analysis of the collection, I argue that dolls formed a replacement for childhood companions for Queen Victoria and allowed her to act out situations that she was strictly prohibited from participation in and exposure to. I also contend that Victoria's doll play can be directly connected to both real individuals and trope character types that existed in British society and thus her doll play both mirrors and predicts her interactions preceding her monarchy and during her monarchy. Ultimately, I argue that the doll is truly a reflection of its owner. Although the doll has specific intended purposes as enforced by the patriarchy, the individual using the doll projects his or her specific desires and needs onto the doll. This project explores the different projections that Queen Victoria's dolls take on for her and how these projections offer insight into her reign.

128 Making Oral History Accessible using Digital Applications
Anna Samuels, Kedric Reiser, Amanda Seim, Stephanie Walrath
History (Public History) | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Jennifer Taylor, Ph.D.

Our poster will discuss the interactive digital platform we created to showcase the Duquesne Veterans' Oral History Project (http://scalar.usc.edu/works/duq-vets-oral-history/index). This digital project, a collaborative assignment completed for Dr. Jennifer Whitmer Taylor's Fall 2018 "Digital Humanities and the Historian” course, relies on multiple media elements and digital history applications to disseminate the information included in the eight oral histories that had been recorded at the time. Our research will investigate the ways in which using a variety of digital tools (mapping programs, podcasting elements, and an interactive timeline) in our project design allowed us to reach a broad audience by catering to a range of preferred learning styles and varying digital literacy levels.
In addition to showcasing elements of the digital project, the poster presentation will discuss how digital humanities can enhance the accessibility of oral history interviews and inspire sustainable and collaborative project design.

Tasnem Alarbi
Department of Instruction and Leadership in Education | School of Education
Faculty Advisor: Carla Meyer, Ph.D.

Multimedia instructional environments are found to be effective for learning (Mayer & Moreno, 2002). A multimedia instructional message is a communication using words and pictures to promote learning. In this paper, a description of the design of a bilingual (English-Arabic) children's e-book that was developed using PowerPoint is provided. Animations, which refer to simulated motion pictures depicting movement of drawn or simulated pictures, were used as the multimedia instructional message. Specifically, dynamic animations were used to introduce Arabic written language to English young learners of Arabic. It is suggested that multimedia tools, such as dynamic animations can be creatively used to design constructive language learning environments.

130 The Effects of Game-Based Instruction on Genetics Content Knowledge Acquisition and Long Term Retention Rates
Brinley Kantorski
Department of Instruction and Leadership in Education | School of Education
Faculty Advisor: John Pollock, Ph.D.

Over the past several decades the field of education has seen exponential growth in the number of educational games available for use in the classroom. Games are a widely used instructional tool, particularly in STEM classrooms. While the prevalence of these games is increasing, there is a noted dearth of literature regarding the impact of these games on students' abilities to learn and retain information. As such, a study to determine if the use of game based instructional practice has an effect on students' immediate acquisition of Genetics content knowledge when compared to traditional hands-on instructional practice was conducted. In addition, the effect of game based instruction on students' abilities to retain Genetics content knowledge for an extended duration was also explored. A comparative study using a pre/immediate post/long term post test methodology was employed to determine if knowledge gain had occurred immediately after instruction and if the knowledge was maintained one month after instruction.

131 The Multicultural Awareness of Self: Lessons from a Service Learning Trip to Nairobi
Jessica Gazzola
Counselor Education | School of Education
Faculty Advisor: Waganesh Zeleke, Ed.D.

Research shows that international service learning trips have a great potential to help prepare students for successful careers with culturally diverse populations, both nationally and internationally. Learning about self-awareness and different cultures requires an exposure to interact with a group divergent from oneself in an unfamiliar setting. A service learning trip is a means to explore diverse interactions
with a specific culture, but it is not the end to cultural awareness. To this end, this presentation aims to explore the benefit of self-reflection on a service learning trip to the Massai Mara in Nairobi, Africa to increase the multicultural awareness and competency of self. Providing insight on individual narrative and reflective feedback is essential to make sense of the ambiguity and complexity of human life. Using a case study and multicultural theory as a frame work, this presentation will provide the audience with a reflective analysis of (a) how the service learning trip to Nairobi provides an understanding of self at a different level, (b) utilizing self-awareness and the experience to increase multicultural knowledge and skills, and (c) share common themes emerged through the reflective and feedback process. Based on this constructive analysis, implication for future research is recommended.

**132 Do Bacteria Effect the Efficiency of Abandoned Mine Drainage Passive Remediation Systems?**

Michelle Valkanas

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Faculty Advisor: Nancy Trun, Ph.D.

Additional Authors: Nancy J. Trun, Ph.D.

Passive remediation systems are increasingly becoming a cost-effective choice for treatment of abandoned mine drainage. Their ability to remediate both acidic and circum-neutral discharge has proven to be successful over time. Currently, these systems are designed based on geochemical processes, with minimal regard to the naturally forming microbial communities. We aim to identify the roles microbial communities, specifically bacteria, play in passive remediation systems. We designed an in vitro system to determine the influence bacteria have on soluble iron, manganese, and sulfate levels in two passive remediation systems in Pennsylvania that treat acidic mine drainage (Boyce and Middle Branch). Slurries were taken from settling ponds throughout the remediation systems, sterilized and reinoculated with bacteria from different points in the systems. We have found biologically-driven iron-oxidation that resulted in iron precipitation occurring in both systems, while Middle Branch also had manganese-reduction that led to resolubilization (e.g. an increase in manganese levels). Our findings suggest that the microbial communities in remediation systems can have both positive and negative effects on system efficiency (e.g. removal of metals). Further understanding of the microbial communities present in passive remediation systems could help to improve system performance and longevity.

**133 Moral Obligation of Buying the Best Baby: Revisiting Arguments for Non-Medical Sex Selection in Global Commercial Surrogacy**

Asmat Islam

Center for Healthcare Ethics | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Gerard Magill, Ph.D.

The moral issues relating to commercial surrogacy in the global context have been a topic of much dispute today. An additional layer of complexity involves to this issue in the era of genetic testing to detect diseases such as Down Syndrome, single gene disorders like cystic fibrosis, inherited cancer syndromes, adult neurological conditions such as Huntington Disease and Alzheimer’s, sex selection etc. Although researchers divided on whether commercial surrogacy can be morally justified, they agree that sex selection on medical grounds is ethically defensible. Besides, although the moral controversies relevant to commercial surrogacy and nonmedical sex selection have been legitimately analysed in the
existing literature distinctly, research in the ethical justification of nonmedical sex selection in
commercial surrogacy is inadequate and underdeveloped yet. Hence, this paper attempts to explore
whether commissioning parents should aim at buying the best babies by examining the ethics
uncertainty and argues that aiming at perfect babies, in this case, may distribute burdens
disproportionately to some stakeholders. First, this paper identifies the moral problems of commercial
surrogacy and non-medical sex selection by examining the argument of exploitation, the argument of
reproductive justice, the argument of natural sex selection and the argument of reproductive autonomy.
Next, this paper scrutinises the arguments for non-medical sex selection in commercial surrogacy, i.e.,
the argument of procreative beneficence and the ethics of human enhancement. This paper, therefore,
concludes that non-medical sex selection in global commercial surrogacy is not morally justified as this
may promote inequality. This research paper is significant because of the growing interest in commercial
surrogacy especially in the age of advanced biomedical technologies.

**134 Unintended Consequences: The Treatment of Chronic Pain as a Global Bioethical Issue
Adele Flaherty
Center for Healthcare Ethics | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Henk ten Have, PhD, MD

The United States currently finds itself in the grips of an opioid crisis that began at the crossroads of a
potent new 'wonder drug' known as Oxycontin and a concerted effort by the medical community to
address the under treatment of chronic pain. This resulted in a significant increase in licit and illicit
opioid use, abuse and accidental overdoses. However, these phenomena are not isolated to the United
States. Countries such as Canada and the UK have also seen a rise in opioid-related deaths. The purpose
of this paper is to address chronic pain and its unintended side effects as global health issues and global
bioethical problems. A review of the literature shows that chronic pain (CP) is one of the most significant
causes of disability worldwide. It disproportionately affects those living in developing countries, females
and the elderly. Despite the number of opioids on the market, the issue of under treatment of pain still
exists globally - primarily in developing countries with limited access to opioids. However, those
countries where opioids are readily available continue to see a rise in morbidity and mortality related to
the use of licit and illicit forms of them, as well as unforeseen consequences such as a rise in the
incidence of HIV and the Hepatitis C virus. In countries that have implemented harm reduction laws and
decriminalized the use of illicit opioids, a reduction in the number of opioid-related deaths as well as
new users is occurring. Global bioethics can play a vital role in addressing this issue on a worldwide scale
by developing new systems of global governance that are poised to influence local and global health
policies that have a positive impact on opioid-related concerns.

**135 "Returning to My Father": A Decolonial Reading of Lk 15:11-32 Towards a Reconstruction of
African Theological Anthropology for Authentic Sacramental Ethics via Indigenous Divinity Graduate
Schools
Besem Etchi
Theology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Elizabeth Cochran, Ph.D.

This paper makes three hermeneutical contributions: (1) By uncovering the Indigenous Norse zero-point
subtext structuring today's Catholic liturgy, the paper constructs ancestral primacy as the delinking
methodology for African theology to move into indigenizing Catholic liturgy; (2) By emphasizing ritual as
transformative technology for identity and relationship, in its wielding of neuro-linguistic programming for the individual's cognitive mind, somatic mind and field mind, the paper establishes indigenous epistemology as the proper spatial locus for any symbolic exchange that emerges authentic sacramental ethics. (3) By discussing the possibilities that creating indigenous Divinity graduate schools in African countries offers, a path of realizing sociopolitical stability and harmony in African states as a communal body is systematized.

With the ritual of eating pods, the pigs grow full and fat while the human, in the divine image and likeness, lives depraved, poor, abandoned, humiliated, and trapped in an ideology of unworthiness. The sub-Saharan African performance of inculcated Catholic liturgies is wanting, in producing the public work of social transformation into life-to-the-full. This parable's solution is self-evaluation for delinking from master-generated identities to undertake a return to ancestral primacy. To "arise and return to my father" is the path of renewed identity and communal relationship where the new ritual of eating the fattened calf restores access to the life-giving force of the Father's knowledge, ancestry, wealth and spirituality. With indigenous divinity graduate schools, African theology will retrieve the epistemology required to reawaken and reset the African mind to the path home. Thus, engendering a new ritual living built on ancestral primacy, hybrid identities and committed to enhance value everywhere. For, liturgy is not complete until the anthropology and ethics that is ritualized is actualized.

This paper includes the scholarly contributions of Elochukwu Uzukwu, Oyeronke Oyewumi, Patricia Hill Collins, Louis-Marie Chauvet, Dilts and Delozier among others.

*136 The Poetic Horn: Rethinking expressive intent in Schumann's Adagio und Allegro
Samantha Duhe
Musicianship | Mary Pappert School of Music
Faculty Advisor: Benjamin Binder, Ph.D.

At first glance, Robert Schumann's Adagio und Allegro for horn and piano, Op. 70 appears to be simply one showpiece out of many the composer wrote in his later years to appeal to a middle class market of amateur musicians. The piece is often dismissed as such, and as a result, scholars tend to exclude it from their discourse on Schumann's expressive musical techniques. Adagio und Allegro is yet to have been investigated in light of this discourse. One of the composer's musical devices, recognized by Berthold Hoeckner (1997), is to mimic the sound of a tone fading into the distance to achieve philosophical or poetic effect. Laura Wahlfors (2016) considers memory to be another of Schumann's devices, arguing that he alludes obliquely to other literary and musical works to make the listener experience an absent past. My project aims to demonstrate how Schumann uses these poetic techniques in Adagio und Allegro, and that the choice of horn as the solo instrument is crucial to his expressive intent in the piece. Schumann applies these techniques of distance and memory to the horn itself at a transitional period in the instrument's development in order to demonstrate how progress can be a celebration, rather than a rejection, of historic traditions.

**137 The Liar's Gambit: An Online, Collaborative Novel
Chelsea Abdullah
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Authorship is a complicated concept, one whose significance and meaning has become even more complex with the impact of digital technologies on composition and distribution processes. "The Liar's Gambit," an online, collaborative novel, was created to test the boundaries of this evolving authorship on the Internet. The purpose of this project was to determine how effective traditional authorship was in a collaborative space, and to observe the ways in which digital interfaces shaped the construction of creative fiction. "The Liar's Gambit" combined academic scholarship with creative composition to study this authorship in a modern, digital space. The project functioned similarly to a choose-your-own-adventure novel only, rather than providing pre-determined choices that led to a set number of outcomes, "The Liar's Gambit" audience was given the agency to shape the narrative more actively through feedback technologies like polls, surveys and commentary. The experimental phase of this project consisted of the novel and the data gathered during the duration of its writing, while the reflection portion used that data to answer a series of questions centered on digital, collaborative authorship. Some of the more significant findings from this project include participants' preferences for anonymity, the effectiveness of using statistics and advertisement to inspire and track reader participation, and the necessity of control in constructing a cohesive narrative. My presentation of this material at the symposium would be multimodal; I would require a visual display to showcase the novel's interactivity. Simultaneously, I would present my findings in relation to what is displayed on the screen. I believe that my research is both pertinent and innovative, and that it would interest not just scholars of media and digital technologies, but also creative writers, students, and anyone else interested in creative composition or scholarship.

**138 THE ROLE OF RELIGIOUS LEADERS IN COUNTERING RELIGIOUS EXTREMISM AND VIOLENCE IN AFRICA

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Since the 9/11 attacks on America, many parts of the world have experienced acts of terrorism, religious extremism and violence. Within the past 20 years, several countries in Africa in particular, have witnessed the insurgence of religious extremism and violence while those yet to experience this phenomenon are increasingly at risk. What is worrying is that religious extremists and terrorists operating in Africa are increasingly establishing contacts with global terrorist groups and networks from whom they receive funding, training and equipment. Massive unemployment among Africa’s youth also makes it easy to recruit them into extremist groups.

In exploring solutions to counter the growing threat of religious extremism and violence in Africa, this paper posits that tasking religious leaders to lead the efforts offers much hope and promise. Africa is considered a religious continent and religious leaders deeply imbedded in their communities, command obedience and respect. In countries like Ghana, Uganda, Central African Republic, etc., where religious leaders have been at the forefront of peace initiatives and conflict resolution, much success has been achieved. I argue that the time has come to explore fully the approach of using religious leaders to help counter religious extremism and violence in Africa.

Key Words - Africa, world, extremism, violence, terrorism, peacebuilding, reconciliation, governments.
A.J. Palumbo School of Business Administration
Slagel, Holden - 98

Bayer School of Natural and Environmental Sciences
Allen, Heather - 27
Barton, Christopher - 101
Craig, Andrew - 92
Delgadillo, Diana - 53
Hacker, Charlotte - 80
Hejnosz, Sarah - 2
Jeganathan, Kathiravan, Narthana - 28
Kelly, Jordan - 65
Kotchey, Joshua - 100
Lohr, McKenna - 107
Loughner, Lindsay - 56
Mahoney, Shannon - 51
McCune, Miranda - 16
McFadden, Nathan - 122
Nikiforov, Alexiy - 104
Polaski, Anna - 43
Pereira, Kenzie - 18
Pros, Gabrielle - 116
Quain, Melanie - 55
Ranger, Emma-Rae - 41
Valkanas, Michelle - 132
Wodyka, Katherine - 124
Wood, Madeleine - 40

Mary Pappert School of Music
Duhe, Samantha - 136

McAnulty College & Graduate School of Liberal Arts
Abbeye-Quaye, Emmanuel - 138
Abdullah, Chelsea - 137
Brown, Donovan - 71
Chilcote, Autumn Marie - 76
Crutcher, Megan - 46
Etchi, Besam - 135
Flaherty, Adele - 134
Halligan, Kurt - 30
Islam, Asmat - 133
Kaser, Bethany - 127
Kast, Amber - 21
Kelly, William Matt - 17
Lower, Arianna - 94
Peifer, Lydia - 64
Reiser, Kedric - 128
Rollinson, Mandi - 113
Samuels, Anna - 128
Seim, Amanda - 128
Shinawi, reem - 110
Slaven, Nicole - 20
Smolter, William - 14
Stoner, Grant - 36
Tusay, Michael - 31
Vayansky, Sophia - 126
Villarreal, Hillary - 111
Walrath, Stephanie - 128,39
Weinbaum, Paul - 47
Wilks, Chantel - 67

School of Education
Acklin, Kayla - 37
Alarbi, Tasnem - 129
Alghamdi, Fatemah - 11
Aljaffal, Mohammad - 3
Bardoloi, Deepa - 120
Baron, Mordechai - 85
Beeko, Ama - 37
Benno, Maria Tina - 12, 81
Branca, Sarah - 85
Comis, Mary - 35
Fidavez, Angela - 85
Gazzola, Jessica - 131
Griger, Cassandra - 81
Jancart, Karl - 114
Johns, Kenya - 37
Kantorski, Brinley - 130
Leopold, Alexandra - 88
Park, Marissa - 88
Pugliesi, Krista - 88
Quinn, Cydney - 35
Radzicki, Amber - 88
Schoenenberger, Ashley - 35
Stankus, Jaclynn - 114
Tokich, Ashley - 35
Tracy, Braelyn - 81
Vanorsdale, Christie - 103
Wadsworth, Jacob - 85

School of Nursing
Rajcan, Lois - 75
Stephen, Jennifer - 112

Rangos School of Health Sciences
Adler, Lauren - 33
An, Mihee - 114
Barber, Michael - 62
Beer, Megan - 49
Bensen, Nicole - 74
Bonfessuto, Julia - 34
Brady, Jacqueline - 93
Campbell, Kaylon - 73
Carman, Nicole - 72
Collins, Baily - 33
Corrente, Brielle - 19
Crooks, Courtney - 109
Damico, Christina - 125
Davidson, Christyn - 58, 33
DeAndrea, Christine - 54
Della Torre, Deanna - 5
Do, Trong - 1
Grelson, Hayley - 52
Griffith, Austin - 57
Griffith, Abbey - 89
Hajovsky, Dale - 66
Hill, Sarah - 63
Jackson, Kristen - 60
Johnston, Hannah - 25
Kelly, Dana - 6
Kovac, Jillian - 79
Langton, Alexsis - 4
Magnotta, Anna - 97
McNerney, Sarah - 117
Mick, Brigée - 26
Miller, Kimberly - 84
Moses, Brittanay - 32
O'Neil, Caroline - 44
Orler, Hayden - 102
Osborne, Laura - 23
Patel, Krishna - 24
Rahill, Clare - 108
Rice, Emily - 61
Ringelman, Nina - 119
Rizzo, Deidre - 123
Roberts, Caitlyn - 106
Schweizer, Callie - 58
Shaw, Rylie - 7
Sibilia, Gabrielle - 90
Sippey, Elizabeth - 48

School of Pharmacy
Bhatia, Tarun - 50
Carson, Scott - 8
Chandwani, Manisha - 105
Dave, Kandarp - 86
Desai, Gauri - 91, 42
Dhumal, Trupti - 42, 91
Gupta, Mohit - 87
Herneisey, Michele - 83
Kamte, Yashika - 59
Komatsu, Takaaki - 99
Kulkarni, Aishwarya - 0
Lambert, Eric - 68
Liu, Lu - 99
Marinari, Christina - 78
Mehta, Zumi - 0
Munmun, Fahima Akter - 115

Nayeen, Md Junayed - 69
Onwu, Crystal - 8
Rague, Andrea - 77
Rish, Adam - 10
Schmitt, Amy - 91
Schreckengost, Briana - 78
Solomon, Keren - 38
Tong, Nian - 70
Wu, Suyang - 10
Zhao, Yuxiang - 10
Zor, Fatih - 99