

## POSTER PRESENTATIONS

### Session 3

**P63. Foolish or Heroic? The Influence of Perpetrator Status on Perceptions of Those who Confront Prejudice**

Jessica L. Carter, Kathryn M. Kroeper, and Mary C. Murphy (IU Bloomington)

Extant research offers little insight on the influence of perpetrator status on perceptions of individuals who confront prejudice. Do we tend to perceive confronters of high status perpetrators (vs. low status) to be foolish or do we laud them as heroes? The present study suggests it's a mix between the two. Participants read a vignette about a bystander who overheard a coworker use an anti-gay slur. The prejudiced coworker was depicted as either lower- or higher-status than the bystander. At the end of the story, participants were either told the bystander confronted or ignored the prejudice. Later, participants were asked to judge the quality of the bystander's decision and forecast their own behavior in a similar situation. Results revealed confronters were perceived as making a better decision than non-confronters; however, this was moderated by perpetrator status: confronting a high status perpetrator was perceived to be a poorer decision than a low status perpetrator. After reading about someone who confronted, participants were also more likely to claim that they would confront, but were less likely to forecast themselves confronting if the perpetrator was high status.

Mentors: Kathryn M. Kroeper and Mary C. Murphy, Department of Psychological and Brain Sciences, College of Arts and Sciences, IU Bloomington

**P64. The viability of Solar Power in the Upper Mid-West of the United States**

Ethan Schafer (IU Southeast)

This study will use a monetary measure (such as capital and money) to determine the logistical cost of using solar energy on a mass scale in comparison of other major energy producing resources (such as fossil fuels, and nuclear power) in the upper Mid-West of the United States. Considered in this review will consider long- term environmental and economic factors to the consumer.

Mentor: James Hollenbeck, Social Studies Department, School of Education, IU Southeast

**P65. Children of Immigration: Challenges to Normalcy**

Angela Brewer (IU Kokomo)

This literature review examines the impacts of being an undocumented child or the child of undocumented parents and the daily struggles and fears of deportation and their implications. By examining this nationally relevant topic I hope to bring light to some of the challenges that these children face in their attempt to live a normal life of a child in America. The time period studied is during a standstill of immigration pathways to becoming a person of legal status. Desperate need for immigration reform is evident. Data has been collected from various published articles that support the idea that undocumentedness causes extreme hardships on children and families. Psychological, emotional, economic and educational effects plague children of immigrants. By bringing awareness to these issues I hope to explore ways to help these children and their families.

Mentor: Stephanie Medley-Rath, Department of Sociology, IU Kokomo

**P66. Distractibility from Sexual Stimuli as a Mediator of Stress and Partner Intimacy**

**Kirstin Clephane**, Amber Craig, and Julia R. Heiman (IU Bloomington)

Primiparous women often experience more stressors related to the demands of parenthood, which may influence attendance to sexual stimuli and partially explain the commonly reported changes in sexual functioning within the first year postpartum. Because sexual satisfaction is associated with relationship stability, sexual satisfaction is a crucial component for functional family models; however, studies of postpartum relationship satisfaction have inadequately examined the impact of sexual intimacy on the transition from family dyad to triad. The current study examines the link between stress, attention to sexual stimuli, and sexual and relationship satisfaction in first-time mothers and nulliparous women. We use an auditory oddball task to measure distractibility via participants' button press response times to the sound of a particular tone – the “oddball tone” – while watching either a neutral or erotic video. All participants complete self-report measures of sexual and relationship satisfaction and current level of psychosocial stress, and new mothers complete additional questionnaires on parental stressors and experiences during pregnancy. While recruitment is ongoing for this study, our expectation is to have gathered data from 40 participants by early November. We expect (1) distraction from sexual stimuli will be associated with lower sexual satisfaction and relationship indices, and (2) that distraction from sexual stimuli will mediate the relationship between stress and sexual and relationship satisfaction.

Mentor: Amber Craig, Psychological and Brain Sciences Department, College of Arts and Sciences, IU Bloomington

**P67. Crime against Women**

**Kassidy Bush** (IU Kokomo)

This paper covers the topic of violence among different race and ethnicities among women. Research conducts domestic violence, intimate partner violence, and sexual assault among culturally diverse adult women who have experienced traumatic childhood abuse. Many statistics correlate with ethnicity and abuse among women. Some underlying reasoning behind violence against African American women is due to the statistic factors of extremely high poverty rates in black communities that subject black women to be victimized more rather than women living in communities not in poverty. A study conducted by the Bureau of Justice Statistics in 2000 showed that 36% to 79% of women of all races are victimized by people they do not know. On average for Native American women, have higher rates of rape and sexual assault compared to white, Latino, black, and Asian women. “An average annual rate of violence of victimized African American women is 51.3 per every 1,000 and 96.8 per 1,000 Native American women” (p. 6 Apel & Dugan, 2003). Asian women are at the lowest risk for violent victimization. Women of all ethnicity are at a risk for violence against them. “As violence against women has seen a decrease, it is still higher among black women compared to white women and higher among Latino women than non-Latino women” (p. 3 Apel & Dugan, 2003).

**P68. Racial Profiling Against Juveniles**

**Brittony House** (IU Kokomo)

Racial profiling among juveniles has become more common, especially since cases like Trayvon Martin's. I touch base on racial profiling against African Americans, Hispanics and even Native Americans. I also talk about the everyday struggles in school and even the neighborhood that minorities live in. Although this is about racial profiling, I go off topic a little about white privilege and how it has an impact on people of other races. This includes stories and even some statistics on crimes and confrontations that white people have had with police officers. A lot of the time these crimes and altercations go unnoticed because the person is white, but I want to bring light to that. People fail to realize that minorities are not the problem. I'm hopeful that this reading will give some a change of thought.

Mentor: Stephanie Medley-Rath, IU Kokomo

**P69. Social Media Research**

**Sara Key, Alison Matthew** (IU Southeast)

With over one billion Facebook users, social media has become a rapidly growing body of research. The aim of this study was to see if the Big Five personality traits and gender were correlated to Facebook usage. We hypothesized openness to new experience, extraversion, and neuroticism would be positively correlated to Facebook usage. Agreeableness and conscientiousness would be negatively correlated. We predicted females would rate higher in Facebook usage than males; those females would rate high in openness, extraversion, and neuroticism. With responses to demographic questions, our SNS questionnaire, and the NEO PI short form, we found a significant relationship between personality, gender, and Facebook usage.

Mentor: Meghan Kahn, School of Social Sciences, IU Southeast

**P70. Effect of Children's Exposure to Violence**

**Arlanda Rainey** (IU Kokomo)

The purpose of this paper is to explore the effects of children's exposure to violence. Children's exposure to violence is a major issue for our society because it affects how children can see things and how children act in the world. Children can be exposed to violence in their home, on T.V, music, through video games, community violence, and domestic violence just to name a few examples. This exposure to violence happens every day throughout a child's life. The outcome of this exposure to violence is significant and could even be devastating in the micro-scale and in the macro-scale. In particular, this paper looks at types of violence that children can be exposed to and the types of interventions that can help them. To do this, the existing literature is reviewed and facts and statistics from this literature are used to recommend solutions and improvements to the practices of related social institutions. Recommendations for future research are made.

**P71. Introducing the Feeding Minds Project: Asset Mapping to Aid the Food Insecure**

**Dana Frank** (IU Southeast), Karen Watts, Michael Foley, Autumn Hockenbury

The main purpose of this grassroots, student-led project is to discover ways to counter student food insecurity on regional campuses and in nearby communities. The researchers received a grant for The Regional Campuses of Indiana University Grand Challenges Initiative. The problem addressed by this research is primarily reducing and understanding food insecurity of college students, which ranges from 14-59% in the United States. An important reason to address this issue is to mitigate the negative effects food insecurity has on academic success, as well as to promote the general health and well-being of college students and local residents. Methods involved interviewing members of the community such as students, faculty, farmers, and food pantries. Information gained from these individuals will be organized through asset mapping. Researchers at IU regional campuses have learned about barriers to students obtaining and preparing fresh food or utilizing the campus food pantry. These barriers include financial difficulties, time constraints, transportation issues, dietary restrictions, and lack of awareness of food resources. Faculty members and student organizations have demonstrated interest in pursuing these aims, including planned programming on campuses such as a speaker series and healthy food cooking demonstrations. Community organizers' outreach efforts have resulted in stronger relationships between the campuses and local communities. Continued efforts will grow enthusiasm and engagement of students. This work can serve as a model for other regional campus efforts to overcome student food insecurity. Asset mapping will provide a reference of available resources for others interested in promoting food access.

Mentors: Jenny Fisher, Department of Biology, School of Natural Sciences, IU Northwest; Melanie Hughes, Library, IU Southeast

**P72. Congenital Adrenal Hyperplasia (CAH): Understanding how CAH Changed my Life**

**Caleb Bell** (IU Southeast)

This research and discussion is based on the origin of Congenital Adrenal Hyperplasia (CAH) and its effects on newborns and their family. With CAH, children are exposed to multiple chromosome issues that prevent their bodies from producing the needed nutrients for survival on its own. My research will consist of recent studies and family counseling strategies will be shared. Included will also be personal encounters I have had with the disease.

Mentor: James Hollenbeck, School of Education, IU Southeast

### **P73. Function Analysis of p53 in Ovarian Cancer Development**

**Aishat C. Audu**, Yong-hyun Shin, Solji Hyeon, Jaeyeon Kim (IUPUI)

High-grade serous carcinoma (HGSC) is the deadliest subtype of ovarian cancer. A specific key tumor suppressor, protein 53 (p53), is mutated in 96-98% of patients with HGSC. Consequently, understanding the mechanism of p53's involvement in HGSC is crucial to future therapeutic measures. We have developed two mouse models that both show similar progression of HGSC to humans: Dicer1-Pten double-knockout (DKO) mice and p53R172H-Dicer1-Pten triple knockout (TKO) mice. Although similar in phenotype, the TKO mice die three months earlier than DKO mice. This suggests p53R172H accelerates HGSC progression and mortality in mice. In previous studies, migration, invasion, and spheroid cell assays were done to compare TKO and DKO mice tumorigenic activity. The results concurred with our mouse studies, with TKO showing faster rates of malignant, tumorigenic activity. In this study, DKO cell lines were enhanced to look like TKO cells via the removal of p53 through CRISPR-Cas9 gene editing method. These p53<sup>-/-</sup> DKO cells then underwent invasion and migration assays and were compared to p53<sup>+/+</sup> DKO cells. The purpose of this experiment is to potentially show that neither p53 mutation or p53 knockout are involved in the initiation of HGSC, but rather enhances its malignancy.

Mentors: Jaeyeon Kim and Yong-hyun Shin, Department of Biochemistry and Molecular Biology, IU School of Medicine

### **P74. Role of the HfaD C-terminal Amyloid Domain in *Caulobacter crescentus* Attachment**

**Delaney T. Halloran**, Gail G. Hardy, and Yves V. Brun (IU Bloomington)

*Caulobacter crescentus* biofilm formation is mediated by the holdfast, a complex of polysaccharide and protein. The outer membrane proteins HfaA, HfaB, and HfaD anchor the holdfast to the cell by an unknown mechanism. HfaB is essential for the localization and secretion of HfaA and HfaD. HfaA has amyloid properties and contains three predicted amyloidogenic regions, one of which shares identity with a region within the C-terminus of HfaD. HfaD has solenoid properties and similarity to adhesins. HfaD and HfaA form high-molecular weight complexes that are important in holdfast anchoring. Although the nature of the interactions between HfaA and HfaD are unknown, we hypothesize that HfaA and HfaD amyloid domains play a role in their association and facilitate the interactions between the holdfast polysaccharide, HfaA, and HfaD. To characterize the role of HfaD in holdfast anchoring, two C-terminal deletions and three C-terminal point mutations were generated and characterized by short-term adherence and Western blot analysis. Results indicated that deleting the C-terminus or mutating conserved C-terminal residues resulted in decreased adherence similar to a complete hfaD deletion. There was a reduction in HfaD protein levels in both the C-terminal deletions and point mutation constructs. In addition, HfaA multimerization was disrupted in the HfaD C-terminal point mutants. Our results demonstrate the importance of the HfaD amyloid domain in both HfaA and HfaD function and indicate a need for further characterization of the HfaD amyloid domain. These studies increase the understanding of bacterial polysaccharide adhesins and their role in adherence and biofilm formation.

Mentors: Gail G. Hardy and Yves V. Brun, Department of Biology, College of Arts and Sciences, Indiana University Bloomington

### **P75. Induction of ALDH1A1 in ovarian cancer cells leads to chemoresistance**

**Umer Khan, Yiming Fang, Kamal Deep and Anirban K. Mitra (IU East)**

Ovarian cancer is the most lethal gynecological cancer and is the 5th leading cause for cancer related deaths among women in USA. Most patients respond well to chemotherapy initially but cancer stem cells survive and finally cause lethal relapse. There has been a lot of research done but no major improvement on 5-year survival expectation has been seen for the past three decades. ALDH1A1 is a suitable marker of ovarian cancer stem cells and ALDH1A1 high expression is associated with poor cancer prognosis (Tomita et al., 2016). Cancer cells that are resistant to carboplatin have shown a higher ALDH1A1 expression. In this study we focus on the viability of ovarian cancer cells with higher ALDH1A1 expression after carboplatin treatment. More copies of plasmid containing ALDH1A1 reporter were amplified via molecular cloning which were then introduced into HeyA8 cells. HeyA8 cells with fluorescent reporter were cultured and treated with 50 $\mu$ M of carboplatin. More cells showed resistance to carboplatin and survived with higher expression of ALDH1A1. Our result indicates ALDH1A1 induction could potentially lead to stemness in ovarian cancer. Some other techniques that were learned in this research were western blotting, MTT assay, and IC 50 determination.

Mentors: Yiming Fang, Kamal Deep and Anirban K. Mitra, IU East

### **P76. Discovery and purification of bacteriophage in water samples**

**Reese M. Miller (IU Southeast)**

Bacteriophages are viruses that infect and replicate within bacteria. There are a wide variety of bacteriophages, with each one using a specific bacterium to replicate. We are isolating bacteriophages that target non-pathogenic bacteria in the hopes of understanding more about bacteriophages and the infection process as a whole. Water samples were collected and purified to isolate new bacteriophages. Each purified water sample was enriched by incubation with four different host bacteria to allow the bacteriophages to replicate and increase in numbers. The enriched samples were then spotted onto plates containing each host bacteria. If bacteriophage were present, an area of clearing was observed on the plate where the bacteriophage has replicated and consumed the bacteria. For each bacteriophage discovered, a series of five dilutions and reinfections was performed to purify the sample. Through this process, three separate bacteriophages have been isolated so far. One sample has been purified and purification of two other samples is in progress. Additional water samples are also being analyzed to look for additional bacteriophages. Information collected about bacteriophages that infect non-pathogenic bacteria can be used to further understand how the replication process works with all types of bacteria, including pathogenic. The greater understanding of how the bacteriophage works can be used to determine the best way to use bacteriophage for treatment of antibiotic resistant bacterial infections.

Mentor: Pamela L. Connerly, Biology Department, IU Southeast

### **P77. Characterization and Classification of Three Phages**

**Ashley Nicole Moore (IU Southeast)**

Our current research seeks to identify three distinct phages isolated from a single enriched sample obtained from the Ohio River. The phages infect *Caulobacter crescentus*, a non-harmful bacterium commonly found in fresh water areas like lakes and ponds. The sample yielded three different plaque morphologies, which led us to believe that each phage was distinct, containing different DNA sequences. Further TEM analysis indicated that the phages, named Giant, Fuzzy, and Norm, all have icosahedral head structures ranging in the diameter from 41-48nm, suggesting they may belong to the Podoviridae family. Currently we are preparing each sample for DNA extraction, and enzymatic digestion, through continued infection and purification trails to yield increased titer. In time, genome sequencing of these three phages can be compared to the genetic sequences of other phages to reveal similarities and differences within a wide range of bacteriophages.

Mentor: Dr. Pamela L. Connerly, Biology Department, IU Southeast

**P78. Does Early Childhood Drug Education Provide Diversion from Using Drugs and/or Alcohol?**

**Megan Bailey**, Brilynn Roberts, Shelby Wasson, Deborah Judge, Toni Morris (IUPUC)

Drug use is at an all-time high. A small rural community in southern Indiana reports almost 12% of its population uses drugs on a daily basis. In 2015 there were 142 confirmed cases of human immunodeficiency virus (HIV) in this same community. The purpose of this project is to gain an understanding of the potential effect of early childhood education related to the use of drugs and alcohol. Two transitional homes for people with addictions are the focus for a mixed methods study. Surveys were administered to all willing participants and consisted of questions regarding drug/alcohol use and early childhood education. Participants in the study (N=17) revealed valuable information confirming their rationales for substance abuse. All participants agreed that drug education needs to be available in early childhood education. Most early adolescents have attempted to use addictive substances at least once. As substance abuse escalates so must our efforts to research and understand the problem. Understanding with a non-judgmental attitude and a desire to make a difference in our community can be the first steps. Examining adolescent drug and alcohol preventive educational programs will promote evaluation for any potential increased educational needs of our youth.

Mentor: Deborah Judge and Toni Morris, Division of Nursing, IU School of Nursing, IUPUC

**P79. Beliefs and Fears of Pregnant Women with Opioid Use Disorder**

**Emilie K. Harvey**, Savannah M. Smith, Victoria A. Wall, Lauren J. Hapke, Samantha J. Sizemore (IUPUI)

We conducted a qualitative meta-synthesis via a rigorous methodological protocol as described by the Joanna Briggs Institute. A complete database search found five articles relevant to the attitudes and perceptions of pregnant opioid dependent women. After applying inclusion/exclusion criteria and carrying out critical appraisal, we extracted qualitative data from four articles. A total of six findings formulated four themes: overarching fear, stigma related to their opioid use, internal ambivalence, and education deficits. These four themes held mothers back from seeking out proper treatment. A majority of mothers in these articles wanted to make lifestyle changes, yet were unable to on their own, either due to fear or due to their internal conflict between their addiction and the well-being of their child. These mothers also had a lack of information that inhibited their care. Implications for practice include providing education regarding the effects of their drug addiction for their child, encouraging the use of rehabilitation to decrease drug use, and providing information about self-care during pregnancy. Within the discipline of nursing, efforts can be made to alleviate fears and stigmas of opioid addicted pregnant women in order to encourage honesty, learning, and a general improvement in given care.

Mentor: Deborah L Cullen, Professor, Department of Science of Nursing Care, School of Nursing, IUPUI

**P80. Elucidating the End-Of-Life Experience for Persons with ALS**

**Rachel Long**, Brianna Havics, Joannah Kelly, Mia Amundson, and Maria Zembillas (IUPUI)

Amyotrophic lateral sclerosis (ALS) is a fatal motor neuron disease that occurs in 4/100,000 people in the United States. Individuals with ALS gradually lose their ability to control voluntary muscles, diminishing their ability to communicate. A comprehensive multi-database search retrieved 31 qualitative research articles that addressed persons with end-of-life experiences with ALS. Inclusion/exclusion criteria were applied and a critical appraisal was applied for the final eight included articles. First person data extraction from the final articles represented emergence of three themes significant to persons with ALS: decisions for life-sustaining support, coping with difficulties, and communication with providers. Tracheostomy and ventilation as a means of prolonging life were important considerations for individuals with ALS. Persons with ALS struggled emotionally with their sudden loss of control and facing their demise. Some facets in which they did exert control, such as living wills, were hindered by patient and healthcare provider communication. Effective communication in end of life circumstances is paramount to preserving patient autonomy and dignity. This can be achieved by the patient conveying their preferences with respect to end of life care in advance, as well the nurses and other healthcare providers supporting the patient emotionally as they cope with terminal illness. Understanding patients' views regarding end of life circumstances is pertinent to nurses and other health-care providers as they plan for palliative care.

Mentor: Deborah L. Cullen, Professor, Department of Science of Nursing Care, School of Nursing, IUPUI

**P81. UV Nucleotide Binding Site Photocrosslinking of Antibodies at Various Light Intensities**

**Celia L. Ochoa**, Nathan J. Alves (IUPUI)

The nucleotide binding site (NBS), found in the Fab variable domain of all antibody isotypes, is utilized in UV photocrosslinking methods for site-specific functionalization of monoclonal antibodies. UV exposure (254nm) to a small molecule, indole-3-butyric acid (IBA), that has high affinity to the NBS can be used to photocrosslink ligands to antibodies. Here, we propose a method to modify antibodies by photocrosslinking with various intensity UV light sources: UV crosslinker XLE-1000 (40-watt), handheld EF-160C (6-watt), and MiniMax UV-5NF (5-watt). The different UV sources possess different power levels and by modulating both time of UV exposure and distance from source site-specific crosslinking at the NBS, for affinity tags (IBA-Biotin) and fluorescent molecules (IBA-FITC) was optimized. Application of the UV-NBS photocrosslinking technique is possible by first incubating the antibodies with IBA-Biotin or IBA tagged ligand followed by 0.5- 1.5J/cm<sup>2</sup> of UV exposure. Conjugation efficiency was determined via Western Blot analysis of IBA-Biotin and absorbance/fluorescent measurements for the presence and quantity of conjugated IBA-FITC. The UV-NBS technique is a reproducible method of photocrosslinking antibodies. Optimization of UV energy exposure resulted in an increase of conjugations per antibody with maximized photocrosslinking efficiency, while anti-body antigen binding activity and Fc recognition were preserved. This study demonstrates that the UV-NBS site-specific antibody modification technique can be accomplished using UV light sources with differing light intensities expanding its implementation potential through making the technology more accessible. Ultimately, the UV-NBS method is an efficient, practical, and accessible method of functionalizing antibodies in diagnostic, pharmaceutical, and therapeutic settings.

Mentor: Nathan J. Alves, Emergency Medicine and Biomedical Engineering, School of Medicine, IUPUI



**P82. Cranial Window Surgery for Longitudinal Imaging in Mice**

**Jessica Felker**, Hui-Chen Lu (IU Bloomington)

Fast communications among a large number of neurons within the brain is critical for human cognitive functions and behaviors. Detecting such communications within neural circuits is becoming possible with multiphoton microscope imaging in awake behaving mice. It is known that intracellular Ca<sup>2+</sup> levels rise significantly during neuronal firing, so the presence of a molecule that fluoresces in response to Ca<sup>2+</sup> influx allows the measure of neuronal activity in real time via multiphoton microscopy. Before imaging, a cranial window surgery must be performed. This entails removing a small portion of the skull and replacing it with a 2mm glass coverslip. If the window remains clear, neural activity of the same animals at different testing periods or using different drugs can be monitored. This summer, the cranial window surgery was practiced on transgenic mice expressing a genetically encoded calcium indicator. This calcium indicator labels active neurons. For practice, the astrocytes were labeled with an easy to inject cell label dye. Images that reached a depth of 271.575µm into the brain were obtained. Our Future goal is to examine whether chronic exposure to marijuana psychoactive compound -9-THC during adolescence will have long lasting impacts on neural communications.

Mentor: Hui-Chen Lu, Department of Psychological and Brain Sciences, IU Bloomington; Linda and Jack Gill Center for Biomolecular Sciences, IU Bloomington

**P83. RNAsequencing studies identify several putative mGluR5 downstream targets**

**Tiffany Xie**, Jui-Yen Huang, Hui-Chen Lu (IU Bloomington)

During neurodevelopment, glutamatergic neurotransmission is an important factor in the formation of cortical circuitry. Group I metabotropic glutamate receptor 5 (mGluR5) plays a substantial role in that process. The role of mGluR5 in modulating the synaptic plasticity of neural circuits is apparent in its ability to induce long-term depotentiation. Additionally, abnormal function of mGluR5 is associated with various neurological disorders, including Fragile X Syndrome. Mice in which mGluR5 is knocked out from cortical neurons have also demonstrated disrupted neurodevelopment in a region of the somatosensory cortex known as the whisker-barrel map. Clearly, mGluR5 plays an important role in cortical circuitry and neurodevelopment; however, many of its downstream targets are still unknown. In this study, we use RNA sequencing data and real-time PCR to identify four potential downstream targets of mGluR5: C1QL2, EOMES, MAL, and SLC30A3. Quantitative PCR validation confirmed that MAL, C1QL2, and SLC30A3 appear to be downregulated in mGluR5 conditional knockout mice, while EOMES appears to be upregulated. Further study of the relation of these putative targets of mGluR5 may shed insight into the mechanisms for the creation and modulation of cortical circuits.

Mentor: Hui-Chen Lu and Jui-Yen Huang, Linda and Jack Gill Center for Biomolecular Science, Department of Psychological and Brain Sciences, IU Bloomington

**P84. A New Form of Alternative Energy: Algae Farming STS and Education**

**James Roberts** (IU Southeast)

This research and presentation will explore the technology and benefits of algae as a new alternative fuel source. This will dive deep into the scientific benefit and the ecological impact, as well as the economic advantages this technology will provide. In an era in which we are trying to distance ourselves from fossil fuels, innovation is the key to find a new sustainable future.

Mentor: Dr. James Hollenbeck, School of Education, IU Southeast

**P85. Variation in temperature during early development affects embryonic nonpolar lipid contents in Snapping Turtles (*Chelydra serpentina*)**

**Antonio Salas** (IU Kokomo)

Temperature variation can profoundly affect rates of development and growth during incubation in oviparous vertebrates, especially during early stages of embryonic development. Less is known about how temperature can affect overall body composition of the embryo during different developmental stages. Herein we examined the influence of varying temperature on body mass and total nonpolar lipid content of Snapping Turtles (*Chelydra serpentina*) during the first four weeks of embryonic development. Eggs were incubated under four different thermal regimes: three with constant temperatures of 23, 25, and 27°C, respectively, and a fourth where temperature oscillated from 22 to 28°C over a seven day period (mean 25°C). Eggs were opened after 28 days of incubation, the embryo was removed, observed for developmental stage, dried to a constant mass, and analyzed for total nonpolar lipid content. Among the three constant temperature groups, both dry mass and developmental stage at increased with increasing temperature, whereas nonpolar lipid content decreased with increasing temperature. Embryos from the oscillating temperature treatment had greater dry masses and were more developed than those from eggs incubated at a constant 25°C, but had similar nonpolar lipid contents. Our findings suggest that developmental temperature not only affects embryonic growth and morphological development during early incubation, but also overall embryonic composition. Such differences may, in turn, influence body composition at hatching and the ability of the hatchling to survive nest emergence, dispersion, and the first winter post-hatching.

Mentor: Michael S. Finkler, School of Science, IU Kokomo

**P86. Water Contaminants and Their Impacts on Human Health in Urban Areas of Rawalpindi, Pakistan**

**Ameera Minhas** (IU Northwest)

Rawalpindi, Pakistan is home to nearly 3.2 million people and Rawal Lake, created by the Rawal Dam, serves as the urban area's main water source. Only 20% of the country's population has access to clean drinking water. Depreciation of water quality in the dam has been of utmost concern due to the increase in rapid population, rapid pace of urban dwellings and industrialization. Drinking and recreational waters supplied from Rawal Dam have been polluted and contaminated with various sources, including metal contaminants, viruses, enteric viruses and numerous pathogenic organisms. This has left a detrimental effect urban dwellers as well as the enclosed environment. The impact of water pollution in Rawalpindi ranges from various illnesses to elevated occurrences of microbial-associated diarrhea in children. This study examines previous reviews, and strives to illustrate the copious harmful effects such water pollutants have on the surrounding population. A review of the previous scientific literature shows negative health impacts; it also aims to depict apparent efforts by Rawalpindi's local governments to improve water quality. Finally, direct water samples were obtained from Rawal Dam in September 2017 and analyzed for common microbial water quality indicators in a laboratory setting using specific methods. *E.coli*, total coliforms and other contamination elements were found to be higher compared to typical baseline levels of contaminants established by global organizations. The findings of this study support conclusions of previous studies, stressing the unclean nature and harmful consumption of Rawalpindi's drinking water to the public.

Mentor: Jenny Fisher, Biology Department, IU Northwest

**P87. Hafnium Triflate: A highly efficient Catalyst in the Acylation of Alcohols and Polyols with Hindered Anhydrides**

**Aaron Day**, Raven Thomas, Enoch A. Mensah (IU Southeast)

A novel and highly efficient method for the activation of highly hindered acid anhydrides using hafnium triflate is described. This new method is highly efficient and requires low catalyst loading at room temperature. This protocol has broad substrate scope to provide the corresponding esters in good to excellent yields.

Mentor: Enoch A. Mensah, Department of Physical Science, IU Southeast

**P88. Exploring the Use of Palladium Catalyst in the formation of Acetals and Ketals**

**Shawn Green** and Enoch A. Mensah (IU Southeast)

A new and highly efficient method for masking carbonyl groups as acetals and ketals is described. The method relies on the capability of palladium catalyst to activate carbonyl functional groups. This method requires low catalyst loading and has been extended to a variety of different carbonyl compounds to form the corresponding acetals and ketals in excellent yields.

Mentor: Enoch A. Mensah, Department of Physical Science, IU Southeast

**P89. Quantifying Halides in the Ohio River to Assess Potential for Ozone Depletion Chemistry**

**Kaila Shaffer**, Jamie Young, John W Halfacre (IU Southeast)

In the Arctic atmosphere, molecular halogens released from frozen surfaces result in the springtime photochemical destruction of surface-level ozone, which controls atmospheric oxidation pathways. However, it is unclear whether this chemistry occurs in populated mid-latitude regions as well. The objective of this research is to use ion chromatography to quantify halogen content from aqueous reservoirs near Louisville, KY, to determine whether this ozone-depletion chemistry may also occur in urban environments. In this presentation, we present preliminary results from our Ohio River samples, which are obtained on a weekly/bi-weekly basis. The anionic composition will be discussed, as will its potential effects toward acting as a source for ozone-depleting chemicals. Ultimately, these results will be included in a chemical model in order to reduce uncertainty in the ozone budget in urban environments.

Mentor: John W Halfacre, Department of Chemistry, School of Natural Sciences, IU Southeast

**P90. One of the Greatest Scientific Discoveries! Exploring the Photoelectric Effect**

**Beau Wimsatt** (IU Southeast)

This research and presentation demonstrate how the photoelectric effect is one of the greatest scientific concepts of all time. Einstein was the first scientist to suggest that light is both a wave and a particle. Albert Einstein explained the photoelectric effect in 1905, but it took many years before the photoelectric effect was applied. Further research of the photoelectric effect has revealed that electrons can be emitted from objects that do not conduct electricity. The photoelectric effect helped create new scientific principles such as photoconductivity, the photovoltaic effect, the Auger effect, and the Compton effect. The main limitation of the photoelectric effect is that it required some form of kinetic energy because light cannot move without kinetic energy. The two main applications of the photoelectric effect are the photoelectric cell and the photomultiplier tube.

Mentor: Dr. James Hollenbeck, School of Education, IU Southeast