April 10th, 2019
1:00 PM - 5:00 PM
UIC Forum
725 West Roosevelt Road
Chicago, IL 60608
UIC IMPACT AND RESEARCH DAY

APRIL 10, 2019

Schedule

11:30 to 1:00 pm  Judges and Students registration and set-up
1:00 to 3:30 pm  Poster viewing and judging session
3:45 to 5 pm  Reception and Awards Ceremony
Acknowledgements

UIC Impact and Research Day Planning and Implementation Committee:

Laura Junker  
Associate Dean, Graduate College

Jaime Velasquez  
Associate Director for Employer Relations, Career Services Director,
Research Communications & External Affairs, OVCR

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James Lynn  
College Acting Director, Office of undergraduate Research

Allen Womble  
Associate Director, Center for Student Involvement

Cover images (top to bottom) are selected from the 2018 UIC Image of Research Competition:

KNEEL, Kaleb Dean, Graphic Design
Not a cell, not quite an organ, Tara McCray, Pathology
In a Small Window, Jeremy Schultz, Chemistry
Firing for the World, Wenpeng Xu, Anthropology

The Images of Research Competition is sponsored by the Graduate College and UIC Library

We would also like to thank the Graduate College for providing the PowerPoint presentation of the Images of Research which can be seen throughout the competition in Main Hall ABC.
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## Research Poster Presentations

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Research
Poster
Presentations
1. **Abdulbasseer, Ummesalmah** and **Papautsky, Elizabeth**  

**Who is Responsible? Family and Clinician Perspectives on Roles and Responsibilities in Critical Care**  

*Undergraduate - Psychology*  

Research suggests that families may have limited comprehension of roles due to the complexity in critical care environments. Given that many patients in critical care are on life support or incapacitated, family members often play a role of the “eyes and ears” of the patient, having conversations with clinicians and participating in making treatment decisions. Critical care can also be a challenging information space for families to navigate, as there are numerous clinicians and staff with a variety of roles and multiple responsibilities across different physical spaces. Limited research has examined family comprehension of clinicians’ roles and responsibilities. The field of human factors offers a systems-level perspective and methods of examining the complexity of real-world environments. Using interviews and questionnaires with families and clinicians, we are examining family and clinician perspectives on roles and responsibilities in critical care, with specific focus on identifying family knowledge gaps and discrepancies of role expectations between families and clinicians. Findings from the current study can be used to inform interventions supporting families’ and clinicians’ communication. It is critical to understand family knowledge gaps and discrepancies in role expectations between families and clinicians to inform solutions that effectively support both families and clinicians in information exchange and care delivery. This may further positively impact patient safety, patient and family satisfaction with care, as well as improve the effectiveness and efficiency of care being provided by clinicians.

2. **Ackerman, Max; Manzella, Christopher; Anikireddy, Aparna and Gill, Ravinder**  

**Measuring anhedonia and gene expression in serotonin transporter (SERT) deficient mice to further understand the gut-brain-microbiota axis**  

*Undergraduate - Medicine*  

Serotonin (5-HT) is a neurotransmitter produced in the brain that plays a critical role in numerous physiological processes including regulation of mood and social behavior, sleep and memory, and appetite and digestion. The serotonin transporter (SERT) is used to assist the transport of serotonin across mucosal membranes in the gastrointestinal (GI) tract and is therefore an important regulatory mechanism of serotonergic signaling. SERT expression is decreased in mice with prominent GI tract inflammation and in patients with inflammatory bowel disease (IBD). The sucrose preference test (SPT) was evaluated to determine if it could be used as an
accurate measurement of anhedonia when comparing the behavior of wild-type (WT) vs SERT knockout (KO) mice. Additionally, the GI tracts of WT and SERT KO mice were flushed with antibiotics to examine if changes in gene expression of WT versus SERT KO are associated with levels of gut microbiota. The SPT revealed no significant difference in anhedonia between WT and SERT KO mice, and there was no significant difference in the expression of HMGCS2 and ACOT1 in ileal mucosa between any of the treatment groups for WT or SERT KO mice. The results of this study are important in further understanding microbes’ role in chronic inflammation as well as the impact of the gut-brain-microbiota axis in diseases with reduced SERT expression such as IBD.

3. Ademiluyi, Adeolu and Aruin, Alexander

**Effect of Modified Sitting Postures on Reaching Distance**

*Graduate / Professional - Physical Therapy*

**Purpose:** Sitting is a common and familiar position used daily as a platform for many motor activities. The goal of the study was to investigate how difference in the chair design and selected sitting manipulations contribute to reach distance in sitting. **Method:** Ten healthy subjects were required to perform reaching forward while sitting in an adjustable chair with 0 degree, 10 degree forward or 10 degree backward inclination of the seat, with and without footrest and leg support and when holding the edge of the seat with the contralateral arm and legs crossed. **Results:** In comparison to sitting with feet on the footrest, the reaching distance decreased significantly when sitting on either forward or backward inclined seat (p<0.05) and it increased when the subjects held the edge of the seat while seated with footrest and the posterior leg support (p<0.05). There was no major effect of crossing the legs or the use of anterior leg support on the maximal reach distance. **Conclusions:** Modification of the chair design could increase or decrease reaching distance in sitting. The outcome of the study provides a background for future investigations of the effect of sitting positions on reaching distance in individuals with impairments who spend most of their time in sitting.

4. Ahmad, Fatima; LaBomascus, Bazil; Welke, Lauren; Tussing-Humphreys, Lisa and Koenig, Mary Dawn

**Comparative Analysis of Nutrition during Pregnancy**

*Undergraduate - Biological Sciences*
During pregnancy, adequate nutrition is important for the health of both the mother and fetus. Inadequate maternal nutrition has been linked with adverse maternal and infant outcomes. The goal of this study is to analyze the dietary intake of primarily low income women from the Chicago area during the third trimester of pregnancy and examine differences by pre-pregnancy body weight status. Thirty-five women receiving prenatal care for a singleton pregnancy at the UIC Center for Women’s Health were enrolled. Dietary and supplement intake was assessed by two 24 hour diet recalls obtained between 32-36 weeks of gestation. Mean (± SD) nutrient intake, serving sizes, and a metric of diet quality, the Healthy Eating Index-2015, was calculated from the two recalls. Sociodemographic characteristics and pre-pregnancy body weight were obtained via self-report. Height and third trimester weight were measured by research staff. Differences in nutrient, serving sizes, diet quality total and component scores by pre-pregnancy body mass index (BMI) group (obese vs. non-obese) was tested using student’s t-test. Statistical analysis was conducted with SPSS statistical software. African American women (n=26) were more likely to self-report obesity pre-pregnancy. Overall, women reported poor diet quality based on HEI-2015 total score. From food and supplements combined however, on average women were getting adequate iron, calcium, protein, zinc, Vitamin C, Vitamin B1, Vitamin B2, Vitamin B3, Vitamin B12, and Vitamin D. The only dietary variable that was different between the obese and non-obese women was for vitamin B12, although still above the recommended daily intake. Obese women were consuming on average significantly less vitamin B12. Diet quality of this small sample of urban pregnant women was alarmingly low. If these findings are reproducible in larger sample coupled with the importance of diet to maternal and infant health, nutritional counseling and dietary interventions should be considered for this already at-risk population.

5. Ahmad, Noor

Dental Caries and Their Correlation to Gender and Systemic Disease: An Analytical Review

Undergraduate - Biological Sciences

Abstract: Dental caries is widely prevalent worldwide and a major cause of tooth loss. With increase life expectancy, older adults are expected to have high incidence of untreated dental caries, posing an alarming public health concern. This analytical review focuses on understanding factors associated with dental caries development and progression in older adults (65 years and older), specifically the role of gender and systemic diseases. The electronic database PubMed and Medical Subject Headings (MeSH) terms were used to narrow the search and find articles pertaining to the identified factors in the last 5 years. When searching the mesh words separately such as dental caries and gender as well as
dental caries and systemic diseases many articles were found. A total of 294 articles were retrieved but of that only 8 articles were reviewed and referenced. Findings from this review highlight past research conducted in each category independently and then an overall correlation of both factors was concluded. Results show that older adult women exhibit higher prevalence of dental caries when compared to men. As for systemic diseases such as diabetes mellitus and cardiovascular disease both have shown a strong correlation to the prevalence of dental caries in adults as one gets older. Therefore, a conclusion that older adult females (65 years and up) that have diabetes mellitus and/or any type of cardiovascular disease are more susceptible and will exhibit more dental caries than younger adults, men, and those without systemic diseases. Overall, a gap of the direct correlation between all factors: gender, systemic diseases and dental caries in older adults was detected. Future research in the associations of these topics can allow for healthcare professionals to potentially have an early insight on the development and management of dental caries to personalize health care so to improve overall quality of life.

6. Ahmed, Madiha

**Female Serial Killers**

*Undergraduate - Psychology*

A serial killer is a very feared creature of society but also brings about a sense of interest and curiosity in some people. Researchers from Psychology, Criminology, Sociology, and other disciplines have studied and tried to understand why humans continuously kill other humans. What makes a serial killer tick? How can society stop or prevent serial killers from becoming who they are? Why is their mindset different from the minds of average everyday law abiding citizens? All these questions lead individuals to become fascinated with serial killers and want to understand how their minds work. Although serial killers are a well researched topic in society, we know very little about female serial killers. The mass of researchers focus on male serial killers since there are more male serial killers than female serial killers. This research will focus on the rare but just as dangerous species of female serial killers.

7. Ahmed, Nadia

**Leber's Congenital Amaurosis**

*Undergraduate - Neuroscience*

Leber's Congenital Amaurosis is an inherited eye disease that is seen at birth or in the first few months of life. It leads to blindness that gets progressively worse with
age and it is due to the degeneration of photoreceptors. A method of treatment that many researchers have studied is gene therapy. Gene therapy is when new genes are inserted by injection into the eye and replaces the mutated gene causing the disease. The eye with poorer acuity vision gets injected in most studies and then the other eye is a control. Through various studies, gene therapy has been found to be successful, however there were adverse side effects seen. In most studies there was intraocular inflammation or an immune response seen. Gene therapy is a good way to treat leber's, however it is most effective when treated early on in order to be most beneficial. In most studies, gene therapy is variable, temporary and leads to incomplete restoration of foveal function.

8. Ajasa, Oluwadamilola

Methods of Language Transmission in the Transatlantic Slave Trade

Undergraduate - Anthropology

For years, the Transatlantic Slave Trade (TAST) has been studied in classrooms throughout the world. While many educators explored the slave trade from this angle, many have not done research on the first encounters that happened between West and Central Africans and largely European slave traders. Specifically, many have not understood how language and communication was processed with such large language discrepancies. My interest to study these language discrepancies came when I was a student in one of those aforementioned classrooms learning about the slave trade and I asked my teacher how the slave trade could happen with the differences in languages between Africans and Europeans. My teacher did not know and it is the intention of this paper to explore the answer to this questions. In this paper, I hope to fill in this gap in Slave Trade literature with the hope that it could give a more robust history of the Slave trade narratives taught in schools. In this study, I also hope to learn more about contemporary language transmission and language learning methods.

9. Alfini, Ashley; Kunzweiler, Colin; Diaz, Angelina; Nikol Popova; Alim, Jibril; Luciano, Monica and Eldeirawi, Kamal

Factors Associated with Maternal Prenatal Serum Levels of Vitamins D and E in A Sample of Mexican American Pregnant Women

Undergraduate - Nursing

Introduction: Research shows increasing evidence that consumption of unhealthy diets and high level of stress are affiliated with health problems in both the mother and the newborn. Prenatal maternal intake of vitamin D and antioxidants have been linked with several health outcomes in the offspring. There
is some evidence that reduced maternal prenatal levels of vitamin D and antioxidants may predispose the offspring to respiratory conditions early in life. In addition, an increased level of stress during pregnancy may negatively impact the developing fetus and have a long-term impact on their life. Mexican Americans undergo significant changes related to immigration/acculturation that might affect their diet and stress levels. However, studies on factors associated with maternal vitamin D and antioxidant (vitamin E) levels and how they correlate with maternal stress levels are lacking. **Purpose:** The purpose of this study is to examine serum levels of vitamin E and D in pregnant Mexican American women and how they vary by demographic factors such as country of birth. **Methods:** Thirty-three, self-identified Mexican/Mexican American pregnant women were included before their 17 weeks of gestation. Dietary biomarkers we will examine in this study serum vitamin D and vitamin E levels based on serum samples collected from the mothers early in the pregnancy. Psychosocial stress was examined by self-reported questionnaires obtained early in the pregnancy. These measures included the 10-item Perceived Stress Scale, 10-Item Edinburgh Postnatal Depression Scale, Life Events Inventory Scale, and Perceived Neighborhood Scale. **Results:** Pending data analysis but will be discussed within the poster presentation. **Conclusion:** This section will be discussed within the poster presentation due to pending data analysis.

10. Ali, Rafia; Wenzel, Elizabeth; Dowty, Shannon and Maki, Pauline

**The Relationship between Perinatal and Postpartum Depression and Glucose Levels**

*Undergraduate - Psychiatry*

Mood changes are common during pregnancy, however, 8-12% of women experience at least one depressive episode during pregnancy. Depression during pregnancy has been associated with adverse perinatal outcomes. Another common pregnancy complication is gestational diabetes mellitus (GDM), which occurs in 5-10% of all pregnancies in the U.S. It is predicted that increased glucose levels, or hyperglycemia, as tested for in the second trimester, are associated with depressive symptoms. Based on previous literature, women with prenatal depressive symptoms were more likely to have a higher glucose level. During pregnancy, a 50-gram, 1-hour, non-fasting glucose challenge test is used to determine pregnancy glucose levels. Using the Patient Health Questionnaire-9, we assessed depressive symptoms in pregnant women getting care at UI Health during their second trimester, third trimester and postpartum. We used a linear model, adjusted for BMI, to see the risk of elevated depressive symptoms (PHQ-9≥10 on a 0-27 scale) in relation to glucose levels. Glucose levels from the glucose
challenge were not significantly associated with elevated postpartum depressive symptoms. The data trends towards higher glucose levels for women with depressive symptoms but further research should be completed to prove the association.

11. Alqaisi, Maryam and Bencehida, Iman

Adaptive Response of NMR vs SKH-1 Mice to UVB

*Undergraduate - Neuroscience*

Cancer is the second leading cause of death in the United States, making it a huge public health problem that needs to be addressed. Using a cancer resistant organism like the African Naked Mole Rats, NMR, (Heterocephalus glaber), offers a new approach to cancer research. This subterranean organism is protected from UVB radiation in its natural habitat. Which presents an opportunity to study novel mutagen UBV in this cancer resistant organism. We irradiated six NMR and six hairless mice (SKH-1) three times a week for twelve weeks at a cytotoxic intensity. Observation after the irradiation period showed that NMR are resistant to UVB in comparison to SKH-1 mice. Calibers were used to measure and collect data on the length and width of lesions, and photos were taken multiple times weekly. NMR did not develop any lesions, but all SKH-1 mice did. Molecular analysis was conducted on the tissue of all subjects by project collaborators at Moffitt Cancer Institute, Tampa FL. Skin biopsies were prepared for RNAseq, histology, and proteomic analysis. Data demonstrated there is a unique adaptive response mechanism that NMR uses to protect itself against UBV stress.

12. Alqam, Musa; Alam, Omar; Xiong, Bei and Cho, Jaehyung

Identification of ERO1 alpha inhibitors as an Anti-thrombotic agent

*Undergraduate - Pharmacology*

Endoplasmic reticulum oxidoreduction 1 (ERO1) is a key oxidase of thiol isomerases in the ER. Of the two isoforms found in mammalian cells, ERO1α is ubiquitously expressed, whereas ERO1β is predominantly found in intestinal and pancreatic β cells. A previous study showed that ERO1α is associated with αIIbβ3 integrin in platelets and that treatment with polyclonal anti-ERO1α antibodies inhibits αIIbβ3 activation and platelet aggregation. However, the pathophysiological role of ERO1α in thrombosis remains unknown. To study this, we sought to identify a novel selective ERO1α inhibitor by a high throughput screen. Using Ni-affinity chromatography, we purified recombinant His-tagged ERO1α and ERO1β in E.
coli. Since ERO1 produces H2O2 during oxidation of thiol isomerases, ERO1 activity was measured by an Amplex Red assay. Using highly pure ERO1α, we have screened 4000 compounds and identified two ERO1α inhibitors which did not affect H2O2 activity and thiol activity. These compounds will be further tested whether they are specific to ERO1α but not ERO1β. Then, we will test whether the ERO1α inhibitors block platelet functions and thrombus formation in mice.

13. Alsayed, Khalid; Liang, Huaqing and Aruin, Alexander S.

Role of applying finger touch to one’s contralateral shoulder on body stability

Graduate / Professional - Physical Therapy

Background. Prior studies reported that body sway is reduced when light or forceful finger touch is applied to a stationary surface. The current study was conducted to investigate the effect of light and forceful fingertip contact with one’s contralateral shoulder on body sway in standing. Methods. Ten healthy subjects were instructed to stand on a force platform in three conditions: (1) with the right index fingertip lightly touching the left shoulder, (2) with the right index fingertip forcefully touching the left shoulder, and 3) with the right index fingertip positioned next to the left shoulder but not touching it. The three conditions were performed with eyes open and closed. The mean distance and velocity of the center of pressure movements were measured. Four subjects participated in a pilot study where we measured force applied to the contralateral shoulder. Results. The amount of force applied during light touch was smaller than applied during forceful touch (p<0.001). Light fingertip contacts with one’s contralateral shoulder reduced body sway while standing upright compared to standing with no fingertip contacts with the shoulder (p<0.05). The application of forceful touch diminished body sway even more (p<0.05). When vision was not available, body sway increased but the effects of the finger touch were preserved. Conclusions. The results of the study suggest that the application of light and forceful touch to the contralateral shoulder could be an effective strategy in enhancing body stability when no external support is available. The study outcome provides a foundation for future investigations of ways to enhance balance control in individuals with balance impairments.

14. Alwadani, Fawaz; Liang, Huaqing and Aruin, Alexander S.

Effects of ankle position, standing surface, and vision on postural sway during quiet standing.

Graduate / Professional - Physical Therapy
The aim of the study was to evaluate postural control of bipedal stance in three different ankle positions (natural, toes up, and heels up) on soft and firm surfaces with eyes open (EO) and eyes closed (EC). Ten healthy young adults were asked to stand on the force platform or over a firm wedge placed on the force platform that induced 15 degrees of either dorsiflexion or plantarflexion. A piece of foam was placed on the top of force platform and on the wedge to provide unstable soft surfaces for each ankle position. The center of pressure (COP) sway distance and velocity in anterior posterior (AP) and mediolateral (ML) directions were calculated for the 12 conditions implemented in our study. Participants demonstrated significantly larger postural sway in all investigated variables in the toes up condition compared to natural standing (p<0.05). Standing with heels up increased COPML distance and COPAP velocity substantially compared to natural stance. EC conditions increased COPAP velocity significantly in the three firm experimental conditions and a more distinct effect of EC was observed in toes up and heel up conditions (p<0.05). Standing on soft surfaces with EO resulted in significant increase in all investigated COP measures in comparison to firm surfaces in heels up and natural stance conditions (p<0.05). However, COP measures did not show considerable increase when standing over soft surfaces in toes up conditions expect for COPML sway distance. Our results demonstrated that standing over inclined surfaces induced higher postural instability as compared to natural stance. The study outcomes also suggest that constant visual feedback is required particularly when standing with toes up and heel up. Negligible effect of modified proprioception in toes up conditions may suggest insufficient transmission of somatosensory inputs from soles of the feet when standing with submaximal stretched plantar flexors.

15. **Andrew, Katharine**

**Accounting for the Impact of Regime Change on Conflict Negotiations**

*Undergraduate - Political Science*

In recent years, research in international relations and conflict studies has demonstrated that the political regime type of a state impacts the state’s propensity to engage in a civil war with opposition groups. However, there is much less attention given to the relationship between regime change during civil war and the effect that regime change has on conflict negotiations, and therefore, the likelihood of peace. This study investigates the impact of regime changes that result in a change in government ideology on the likelihood of negotiations occurring to resolve civil conflict. The primary hypothesis is that new regimes with a more moderate ideology are more likely to negotiate than new regimes with a more authoritarian ideology. This subject is important to analyze, as creeping authoritarianism is not only prevalent in past civil wars, but is a current theme in
today’s world, including in Turkey, Hungary, and Syria. By analyzing how a turn towards illiberalism during civil wars impacts the likelihood of negotiations, I will demonstrate that increasing illiberalism reduces the incentives to search for peaceful alternatives. This will be illustrated through four civil war case studies that include both moderate and illiberal regime changes, Egypt (1993-1998), Iraq (1961-1975), Algeria (1992-2003), and Yemen (1994).

16. Antunez, Adriana; Calero, Angelo and Coba-Rodriguez, Sarai

“Just Set Aside Some Time”: How Parents Play an Important Role in the Transition to Kindergarten

Undergraduate - Urban Education

Parental involvement, or the multiple ways that parents support their children’s education and learning, has emerged as a key protective factor for children’s academic and future success. Researchers consistently demonstrate that higher levels of parental involvement are positively associated with the development of social and academic skills both at school entry and during later years. Although research has shown that parental beliefs and practices are a critical factor in children’s success throughout their school careers, little is known about what preschool teachers believe parents should do to prepare their children for the transition to kindergarten. Thus, the goal of this project is to explore preschool teachers definition of parental involvement. All five lead preschool Head Start teachers were recruited to participate in this study. Through in-depth interviews, we learned that teachers described both home-based involvement and school-based. Home-based involvement included parents teaching children socio-emotional skills, emergent literacy, approaches to learning, motor development, nominal knowledge, and general knowledge. Teachers also believed that involved parents were those who provided children with physical well-being and asked children questions. School-based involvement included parents attending parent-teacher conferences as well as attending meetings. Teachers also advise that parent(s) check up on their children regularly to make sure that their children are meeting expectations set by the school. After all, parents play a critical role in their child’s school journey more than they tend to believe. Parental involvement in a child’s kindergarten transition, in essence, is a large determining factor on whether or not children will have the resources to succeed. Ultimately, teachers recommend that parents should set aside some time for their children to prepare their children for this journey.

17. Arroyo, Gabriela and Diep, Cynthia
Major Diagnostic Category Associations

Undergraduate - Health Information Management

Major Diagnostic Categories (MDCs) were created to divide principal diagnoses into 25 mutually exclusive categories. This research will examine the top six MDCs - including Diseases and Disorders of the Nervous System; Ear, Nose, Mouth and Throat, Respiratory System; Circulatory System; Musculoskeletal System and Connective Tissue; and Endocrine, Nutritional and Metabolic System - and determine if there is an association between gender, age, and region. Our research was done using a sample of 1,000 cases that were randomly selected from the Healthcare Cost and Utilization Project (HCUP) National Inpatient Sample (NIS) 2012. The three independent variables – gender, age, and region – were compared with a confidence level of 95% and an alpha level of 0.05 using a Chi-square test to determine whether the results were statistically significant. Our results show two out of three associations. According to previous research, females have a higher incidence rate for Multiple Sclerosis (MS) – a Nervous System disease – compared to males (Harbo et al., 2013). Our research shows a p-value of 0.091 meaning that there is no association between gender and the top six MCDs. However, there is an association between age and region within the top six MCDs. It has been found in previous research that as we age, lung function begins to decrease and older adults are more vulnerable to ventilatory failure (Sharma and Goodwin, 2006). Our research shows a p-value of 0.029 meaning that there is an association. It has also been found that the relationship between people’s health and their location are closely related (Weinsein et al., 2017). This is proven to be true, as our research shows a p-value of 0.015.

18. Ashrafi, Samar

Understanding the Prevalence of Traumatic Events in Patients Who Present in Various Medical Settings

Undergraduate - Chemistry

My capstone project will be an analysis of self-report surveys taken at UIC clinics, studying the relationship between traumatic events patients have gone through and how it shows in physical health symptoms. It will also gauge how comfortable survivors of traumatic events are with sharing personal details of their life with primarily their dentist and physicians. This study will help establish an understanding of how healthcare providers should provide effective and sensitive care.
19. Ateeq, Safia

Expression of HCN1 Channels in Hippocampal Dendrites of Alzheimer’s Disease Mice

Undergraduate - Neuroscience

Hippocampal dendrites of dorsal CA1 pyramidal neurons harbor a mixed channelopathy involving both loss- and gain-of-function channelopathies centered around voltage signaling of hyperpolarization-activated, cyclic nucleotide-gated, non-specific cation (HCN1) channels. The goal of this project is to determine whether CA1 pyramidal neurons in the ventral half of the hippocampus show a similar mixed HCN1 channelopathy as exhibited by the dorsal half, using the 5xFAD mouse model of Alzheimer’s disease. It is possible that the mixed HCN1 channelopathy will be absent in the ventral hippocampus of these mice, as they are primarily impaired in forms of learning and memory that rely heavily on dorsal hippocampal computations (e.g., spatial learning, novel object recognition). However, there is reason to predict that the channelopathy will be present in the ventral hippocampus because Alzheimer’s disease pathology is more severe in ventral, as compared to dorsal, hippocampus in these mice. Part of that channelopathy is the progressive loss of distal enrichment of membrane-bound HCN1 channels. Through immunogold electron microscopy, aged 5xFAD mice exhibited a loss of distal enrichment of HCN1 channels in the ventral hippocampus, compared to young 5xFAD mice. This loss of distal enrichment is significant because it allows us to infer that CA1 pyramidal neurons in the ventral half of the hippocampus show a similar mixed HCN1 channelopathy as exhibited by the dorsal half.

20. Baber, Komel

Gillette Grant Proposal

Undergraduate - Psychology

I will be writing a grant proposal for a rape crisis center located in Chicago called Resilience for Gillette a men’s company who is motivated to help “men be the best they can be”. I have done research regarding the importance for prevention education amongst adolescents, with a focus on young men. For decades’ sexual violence survivors have remained silent about their abuse in fear of being stigmatized against and dealing with internalized self-shame. According to the American Medical Association sexual violence is a “silent, violent epidemic” and it is only recently that individuals, institutions, and organizations have begun to realize that we need to take a closer look at the root causes of sexual violence and
begin integrating prevention methods (Tabachnick, 2013). In this grant proposal literature will be reviewed to show the best preventative measures against sexual violence, with a focus of prevention education as the best means.

21. Banks, Briana; Hong, Lenny and Diamond, Alan

**Determining the Morphologies of SELENOF and SELENOF-Deficient Cells**

*Graduate / Professional - Pathology*

Prostate cancer is the most common cancer among men with many individuals undergoing prostatectomies unnecessarily. Prostatectomies are very invasive and possible side effects of treatment include infertility, erectile dysfunction, and emotional distress. In recent years, levels of selenium in prostate cancer patients have been associated with prostate cancer grade, occurrence, and outcome. Selenoproteins mediate the biological effects of selenium. One member of the family of 25 selenoproteins, SELENOF is known to be expressed at high levels in the prostate. We hypothesize that low levels of SELENOF in prostate tumor cells contribute to cancer progression and increased mortality. SELENOF localizes to the plasma membrane in normal prostate epithelium as well as primary and immortalized cells, but not in other tissues or prostate cancer. To recapitulate the loss of SELENOF in the plasma membrane and gain a greater understanding of the function of SELENOF, levels of SELENOF were knocked down with a shRNA construct in RWPE-1. Stable cell lines expressing 70% and 30% of the SELENOF levels observed in control cells transfected with a scrambled control shRNA construct were generated for analysis. These cells will be compared for changes in phenotype, cell signaling, and cell-cell communication. Whether reducing SELENOF levels in these cells affects their proliferation, morphology, and expression of selected genes will be associated with cancer progression will be assessed. These experiments are relevant to the understanding of the racial disparity experienced by men of African American and Jamaican descent who experience prostate cancer mortality at a rate that is 3x the national average. This is because African American express a SELENOF polymorphism associated with both reduced SELENOF levels and prostate cancer mortality at a frequency that is approximately 10 times more frequent than Caucasian men.

22. Battle, Ericka

**Expression, Purification and Inhibition of VraS-C Protein for Drug Discovery**

*Undergraduate - Center for Biomolecular Sciences*

The VraS-C protein is coded from the VraS gene located in the Staphylococcus aureus organism. S. aureus is a common bacterium often found in the skin and
hair; it can reside in the microbiome of healthy people but more so in people with infections of the throat, skin, and/or eyes. This bacterium is one of many that is developing resistance to antibiotics, which is a growing issue for the medicinal community. Once bacteria have developed resistance, it becomes increasingly difficult to treat bacterial infections with antibiotics which allows for serious, perhaps deadly infections. Thus, newer methods that can induce bacteria apoptosis are being investigated to combat this. There are a number of ways in which bacteria can die; one of which is the inhibition of protein function within the bacteria. Proteins are building blocks that keep the bacteria alive; they are used to send signals for chemical reactions within the cell, they are used for structural purposes within the cell and they are used to create new molecules with the genetic information from the cell, allowing for reproduction of antibiotic resistance genes. If protein function can be inhibited, then the cell will ultimately die. That is the purpose of this research; to find new compounds that can inhibit proteins and be used to combat the growing antibiotic resistance. The VraS-C plasmid will be transformed into chemically competent E. coli cells in order to be expressed, then the cells will be lysed to expose the VraS-C protein and the protein will be purified using an immobilized metal ion affinity column (IMAC), as well as, a size exclusion column. Also, thermal shift assay (TSA) will be used to determine which compounds successfully inhibit the protein. Here we report the successful expression and purification of VraS-C and TSA results expressing inhibition of VraS-C.

23. Baxa, Madeline; Kent, Denise and Fritschi, Cynthia

The Relationship between Food Insecurity, Psychological Health, and Self-reported Academic Performance among University Students

Undergraduate - Biobehavioral

Purpose: The purpose is to explore the relationship between food insecurity, anxiety, depressive symptoms and self-reported academic performance among university students. The first aim is to examine the relationships between food insecurity, psychological health (depression, anxiety), and self-reported academic performance in university students. The second aim is to describe the magnitude of food insecurity and food pantry use among UIC students.

Background: Food insecurity has been recognized as an issue for many college students worldwide. Overall, a majority of studies have estimated the total food insecurity rates to be between 20% to 40% within their student populations. Research about food insecurity at postsecondary education institutions is an emerging area of study. Such studies have only been conducted within the last ten years; making it a fairly new topic of concern and one that needs more attention.
Methods: An online survey that consists of validated questionnaires regarding food insecurity, anxiety, depression, and general health, as well as, demographic questions developed by the research team, will be used to collect data. Using the survey software Survey Monkey, a survey of 59 questions will be sent to UIC students through the undergraduate and graduate email listservs. A descriptive, correlational design will be used. Data will be analyzed using descriptive statistics and correlation and regression models. Descriptive statistics will be used to examine and summarize the demographic information of participants, as well as, to describe the magnitude or levels of food insecurity and food pantry use among UIC students. Correlation statistics will be used to analyze the relationships between self-reported academic performance and the independent variables (food insecurity, anxiety, depressive symptoms).

Results/Conclusion: Final data will be presented at the poster presentation.

24. Bazzino, Paula; Hsu, Ted and Roitman, Mitchell

Induction of thirst through multiple mechanisms recruits the mesolimbic dopamine signaling to water cues

Graduate / Professional - Psychology

Body fluid homeostasis is essential for survival and challenges to body fluid homeostasis are countered by goal-directed, motivated behavior. Dopamine neurons of the ventral tegmental area are critical for goal-directed behavior. Recent work has shown that cues predicting body fluid restoring stimuli evoke an increase in dopamine signaling only in animals in a state of homeostatic need. Here, we compared manipulations that generate thirst through different mechanisms for their ability to recruit dopamine signaling to a water-predictive cue. We use in vivo fiber photometry to measure dopamine activity in awake animals. The transgenic rats used in this experiment express Cre-recombinase under the control of a tyrosine hydroxylase promoter (TH-Cre +) and surgery was performed to inject a Cre-dependent adeno associated virus containing the fluorescent calcium indicator CaMP6f into the ventral tegmental area (VTA) – the site of dopamine cell bodies. During the same surgery, a fiber optic was lowered into the VTA and cemented in place. After rats recovered from surgery, they were water restricted, and trained to anticipate water sipper access following a cue. After 5 daily training sessions, rats were returned to ad libitum water access. Experiments were then conducted while rats were water-sated. Just prior to each experiment, rats were injected with thirst producing stimuli or controls. In one cohort, the thirst producing hormone Angiotensin II (AngII) or vehicle was injected into the lateral ventricle. In another, rats received a thirst-producing intra-peritoneal injection of...
hypertonic saline or isotonic control. After treatments, we recorded the fluorescence due to dopamine neural activation in all rats. Results showed cue-evoked VTA dopamine activity in both AngII and hypertonic saline treated but not control rats. Since AngII and hypertonic saline induce thirst via different mechanisms, our data highlight how the central sensing of thirst, regardless of mechanism, recruits VTA dopamine activity. The data also highlight the importance of the mesolimbic dopamine system in integrating physiological state in the service of motivated behavior.

25. Benavides, Tyler

The Effects of Emojis on Consumer Engagement

*Undergraduate - Managerial Studies*

In relationships between two people, the specific use, response, and interpretation of emojis varies depending on the individual sending the message and the individual receiving the message. A literature review was conducted from all relevant data and research available online, focusing on the different factors of people, like gender, age, type of relationship, and more, observing how it ties into the usage of these emojis. The relationships between businesses and consumers were also studied, looking at the same aspects, as well as focusing on some of the same factors related to consumers. Further investigation will be conducted specifically as to why people interpret negative messages that use emojis as less serious or less negative, yet when interpreting positive messages with emojis, they interpret the messages as more positive. Information will be collected from an online study and results will be compiled with the literature review to create a conceptual background, results, and future directions for research.

26. Benson, Brittany

Targeted for Harm: A Narrative of Psychological Suffering

*Undergraduate - Kinesiology*

**Background:** The Grief Model (GM) (Kubler-Ross, 1969), has been applied to injury and recovery of athletes experiencing season or career ending injuries. When applied to athletes, the model presents a linear process grievers are said to pass (Denial, Anger, Bargaining, Depression, Acceptance) through in order to recover from their grief. **Objectives:** This narrative study examined the emotional response of an athlete who physically rehabilitated from two different injuries requiring extended rehabilitation terminating their sport participation.
Methods: A female multisport athlete, aged 26 told their story in a single audio recorded semi-structured telephone interview (54 minutes) which yielded a 21-page transcript expressing their experiences following their first sport career ending knee injury then traumatic brain injury (TBI). The audio was listened to 12 times. Transcription of the interview reviewed and coded 3 times. Thematic analysis was conducted with the research team and external member checking validated the findings.

Results: The experiences extracted from this narrative indicated five dominant themes: 1) targeted for harm, 2) struggles with social support (specifier: emotional), 3) redirection of her emotions into other sport participation, 4) exiting sport and work context yielded positive emotions, 5) the grief model was irrelevant to this experience.

Conclusions: The narrative demonstrated scant evidence for the application of the GM in this case. Results concluded the GM did not account for the emotional recovery experiences of this athlete. This case invalidated the application of the GM’s explanatory accuracy and specificity for psychological and physical sport injury recovery.

Keywords: Grief Response; Sport Injury; Emotional Response; Stage Model; Athlete

27. Withdrawal

28. Besana, Tiffany and Loyd, Aerika Brittian

Asian American Media Representation and Adolescent Identity Formation

Undergraduate - Educational Psychology

While the number of Asian Americans in the country continues to grow, misrepresentations of this minority group remains common in U.S. films. Examining the potential effects of limited media representation of Asian Americans is important because adolescents are consumers of media and viewing such films can negatively affect their identity development, which is an important cognitive, social and developmental task related to understanding one’s place in the social world. This senior capstone project investigates Asian American representation in U.S. films and the potential effect of media representation on adolescent identity formation through two methods: 1) a film analysis; and 2) a literature review. Observations focus on the presence of negative racial stereotypes and positive
representations portrayed by Asian movie characters in U.S. films over the past 25 years. Data were also collected on the type of role (e.g., lead vs. supporting character), frequency of stereotypical and positive characteristics displayed, and the content of dialogue by Asian characters in these films. The data will be displayed as trends over time. Preliminary results suggest the frequency of lead roles increased over time, while the number of stereotypical traits remained frequent. The discussion will center on how parents and educators can play a role in allowing adolescents to explore their identity in a healthy way amidst the misrepresentations of Asian Americans in U.S. media.

29. Betzelos, Priscilla

Dentist’s Recognition of Patient Anxiety- A Step Towards Overcoming Dental Fear?

Undergraduate - Biological Sciences

Background: Dental anxiety is a serious issue that prevents many people from going to the dentist and hence leading to poor oral health. The dentist’s ability to recognize the extent of a patient’s anxiety while in the dental office could contribute to the patient overcoming his dental fear. This can be done by the dentist adjusting his techniques accordingly in order to accommodate the anxious patient, thus allowing that patient to feel more comfortable and eventually to overcome his dental fear. Objective: To determine if a dentist is able to recognize and rate a patient’s dental anxiety.

Methods and Materials: A dentist at an office in a Northwestern suburb of Chicago rated twenty of his patients with the Corah Dental Anxiety scale. After obtaining consent, the same twenty patients also rated themselves on the Corah Dental Anxiety scale. Results: The dentist rating correlated with the patient anxiety at R=0.63, P=0.004. The scatter plot shows that the dentist tended to minimize the patient’s anxiety. Conclusions: This limited pilot study of one dentist indicated that although the dentist was able to significantly predict patient anxiety, the dentist tended to underrate the patient’s dental anxiety. Overall, by the dentist having a better understanding of the extent of a patient’s anxiety while in the dental office, it should help that patient overcome his dental fear by the dentist adjusting his techniques in order to better accommodate the anxious patient.

30. Bilek, Kaitlin and Hughes, Tiara

Chronic Condition Factors: 2012 U.S. Acute Care Hospital Inpatients

Undergraduate - HIM department
This study explored how the number of chronic conditions varies among different demographics including race, gender, U.S. census region and median household income. In 2014, it had been reported that 60 percent of Americans had been diagnosed with at least one chronic condition. Examples of chronic conditions include type 2 diabetes, cardiovascular diseases, chronic respiratory diseases and cancers (WHO, 2015). Our research of previous studies has also shown disparities in the average number of chronic conditions across gender, location, income and race. Quantitative research was conducted using 1000 randomly selected cases from the Healthcare Cost and Utilization Project (HCUP) National Patient Sample (NIS) of 2012. An ANOVA test showed no difference between the average number of chronic conditions between U.S. census region and gender. When comparing the South region to the other U.S. census regions, we did find a significant statistical difference that indicates there is a higher number of chronic conditions for males in the South region than females in the South region. The next ANOVA test showed no difference in the average number of chronic conditions by median household income and race. Between groups, we found that there is a difference in the average number of chronic conditions between Whites and Hispanics for the low household income of $1-$47,999. Whites have a significantly higher average number of chronic conditions than Hispanics. With high rates of chronic condition in the U.S., it is imperative to establish different demographic populations that are at risk to promote the health of U.S. population. This information can help stakeholders, including healthcare providers, policy makers, government, non-governmental organizations and our society, address the adverse effects of chronic conditions in an efficient and timely manner.

31. Blackman, Malik; Lin, Yang and Pineda, Vanessa

Portable Two-Step Emulsification System

Undergraduate - Mechanical and Industrial Engineering

This research is investigating the design of a portable two step emulsification system, aimed to produce double emulsions with an encapsulation efficiency not seen in other emulsion systems. These emulsions are dispersed multiphase systems consisting of at least two immiscible liquids. The definition of a double emulsions is an emulsion inside of an emulsion, or it can also be thought of as a concentric circle (a circle inside of a circle). In the interest of our research we are attempting to create these emulsions in a two-step emulsification system. The use of a two-step emulsification process is advantageous to a single-step emulsification due to encapsulation efficiency. For the case of the two step emulsification system, we are dealing with osmotic and Laplace pressures that are particular in the stability of the double emulsion. These two pressures relate to
solute concentration and droplet size in accordance with surface tension. With these particular parameters, the y are especially beneficial to controlling the release efficiency of encapsulated materials, for example.

For our research, we will be utilizing two syringes of differing diameters for our two step emulsification system in order to produce the double emulsions. With these syringes we will investigate how we will place the two syringes concentrically, as well as a design for a connector piece that will form the first emulsion from the end of the larger diameter-sized syringe, directly to a nano channel. The outlet of the nano channel will then be placed directly above the surface of a volume of a particular surfactant (either mineral oil or deionized water) to which the second emulsion will then be created. Parameters that will be considered in regards to the research will be differing flow rates, pressure on the syringes necessary to produce the emulsion, inserting the surfactants into the syringes themselves, as well as double emulsions collection.

32. Bosak, Dianna; Kaelin, Vera; Anaby, Dana; Teplicky, Rachel; Jarvis, Jessica and Khetani, Mary

Caregiver creation of participation-focused care plans using Participation and Environment Measure Plus (PEM+)

Undergraduate - Occupational Therapy

Background: Family-centered care (FCC) is a model for rehabilitation practice that focuses on collaborative partnerships between providers and their clients (i.e., children and their caregivers). FCC is a best-practice standard in pediatric rehabilitation settings, and its implementation is expected to yield better outcomes for children and greater caregiver satisfaction with rehabilitation services. A commonly cited barrier to implementing FCC is provider perceptions about caregiver capability to contribute to designing an initial plan of care, due to lack of skill and/or interest. Objectives: To address barriers to FCC through the following objectives: 1) report the proportion of caregivers that created multiple care plans using PEM+, a web-based application; 2) assess the proportion that created complete and participation-focused care plan(s); and 3) describe characteristics of those that did not create a complete and participation-focused care plan. Methods: Sub-study of data gathered from caregivers (N=18) from the PEM+ pilot trial. Participants were caregivers of children aged 0-5 years receiving rehabilitation services in an early childhood program. A deductive analytic approach was used to content code care plans as complete and participation-focused or not complete and participation-focused, based on four quality criteria. Descriptive statistics were reported to describe caregivers that did not meet these four criteria. Results: Of caregivers who created care plans using PEM+, 72.2% created multiple care plans, 83.3% created at least one care plan that was complete and participation-
focused, and 83.3% exceeded the required criteria. **Conclusion:** Results suggest that caregivers are interested and capable of participating in a collaborative goal-setting process when using PEM+. This indicates that the implementation of FCC in clinical workflow is feasible with the use of an electronic health tool like PEM+ and may better facilitate such care. PEM+ warrants further testing prior to implementation.

33. Bravos, Anastasia

**Bioactive Therapeutic Materials for Dental Pulp Therapy and Their Chemical Structure**

*Undergraduate - Biological Sciences*

Restorative Endodontics is a growing field in Dentistry that has the potential to completely revolutionize the way things are currently being practiced; it uses biologically-based techniques to replace damaged structures in the tooth such as dentin, root structures, and cells of the pulp-dentin complex. This study deals specifically with immature teeth with pulp pathology and teeth that have undergone trauma. The goal of restorative endodontics is to repair the already-existing tooth structure rather than having to perform extreme procedures such as extractions. Therefore, treatment of these teeth will be centralized on preserving the remaining pulpal and apical tissues to achieve root maturation. This will be accomplished with the use of advanced biocompatible materials which will form mineralized tissue barriers at the dentin-pulp interface, enabling regeneration and preventing leakage of tissue fluid and bacterial byproducts. Permanent teeth pulp therapy with three bioactive materials was performed following a strict protocol, and long-term follow up was conducted. In addition, in vitro investigation of bioactive materials ProRoot MTA and EndoSequence Root Repair Material (ERRM) was also performed. Ultimately, minimal additional root length was achieved. In conclusion, the mechanical properties of bioceramics at the dentin interface is extremely dependent on superior sealing and biocompatibility. More studies need to be conducted because although maturation of these bioceramics might seem complete at 12 hours, each of them do undergo further setting for up to 3 months, enabling remineralization at the surface.

34. Brown, Ryan W.

**The Intonation of the Left Periphery of Heritage Spanish Speakers**

*Undergraduate - Hispanic and Italian Studies*
The majority of the literature on the intonation of the left periphery of Spanish lacks investigations into heritage populations, and this investigation aims to begin to fill that gap. Authors have reached differing conclusions on the intonational production of the left periphery in Spanish. Frascarelli and Hinterhölzl (2007) posit a pragmatic hypothesis which argues that intonational production of the left periphery corresponds to discourse functions. Feldhausen (2016) and Sequeros-Valle (forthcoming) put forth a syntactic hypothesis, concluding that intonational patterns correlate to different syntactic constructions. Participants were asked to complete a recorded scripted production task including 24 stimuli in pseudorandomized order, 12 of which were fillers. Two syntactic constructions (clitic-doubled left dislocation and focus fronting) and two discourse functions (contrastive and familiar) were combined into three conditions: 1) C-CLLD, 2) F-CLLD, 3) C-FF. Results show an overall rising intonational pattern, with no effect for discourse context. For construction-type, however, pairwise comparisons show that FF is different than the two CLLD conditions; even though the overall pattern is rising, 20% of FF instances present a rise-fall contour. Further, no differences were found for the presence/absence of pause. Therefore, the results support the syntactic hypothesis (Feldhausen, 2016; Sequeros-Valle, forthcoming) that intonational production aligns with syntactic constructions, and challenges the pragmatic hypothesis Frasacelli and Hinterhölzl (2007).

35. Brown, Tyler; Florin, Tanja; Shah, Vallari; Colon, Sarah; Vázquez-Laslop, Nora; and Mankin, Alexander

**Optimizing the antimicrobial peptide Apidaecin by in vivo selection**

*Graduate / Professional - Medicinal Chemistry and Pharmacognosy*

Protein synthesis is a key target of action for many classes of antibiotic compounds, such as the proline rich antimicrobial peptides (PrAMPs) produced by multicellular organisms. PrAMPs reach their intracellular target through specialized transporters present in the cell membrane of some bacterial strains. We have previously shown that the PrAMP Apidaecin (Api) has the unique mechanism of arresting translation termination by penetrating the nascent peptide exit tunnel (NPET) after peptide hydrolysis and trapping the release factors (RF1 or RF2) on the ribosome. This interaction causes cell-wide inhibition of protein synthesis and results in cell death. The cryoEM analysis of the Api-bound terminating ribosome showed that the orientation of Api in the NPET matches that of the ribosome-synthesized nascent chain. The N-terminus extends down the tunnel and the C-terminal amino acids interact with the P-site tRNA and with the RF in the A site. A number of Api residues interact with rRNA nucleotides and ribosomal proteins of the NPET. However, it remained uncertain which of those possible interactions between Api and the ribosome were essential for the binding and consequent
inhibitory function of Api. In order to address this question and select the more active Api analogs, we established an experimental model that, rather than to exogenously add synthetically prepared Api to bacterial cells, allows us to express Api endogenously from a plasmid vector. Based on this system, we have prepared an extensive library of 512 Api analogs, with single codon mutations at each codon of the Api gene, excluding start and stop codons. This system allows us to select for the most toxic variants and will help us identify which mutations interfere with Api binding and inhibition, as well as which mutations engender analogs with superior inhibitory activity. We envision our experimental Api expression system can be also implemented for the selection of species-specific Api varieties. Additionally, controlled expression of the Api gene could be implemented as a tool for negative selections screens.

36. Bryers, Courtney and Deac, Abigail

Patients with Multiple Diagnoses: A 2012 National Inpatient Sample

Undergraduate - Health Information Management

The objective of this research was to determine the association between the average number of diagnoses (NDX) with regards to median household income, average length of stay, and primary payers. Our interest was to see how the average number of diagnoses compares to the average length of stay for patients, particularly across 4 primary payers (Medicare, Medicaid, Private Insurance, and Self-pay). We were also interested in determining how the average number of diagnoses and average length of stay is affected by median household income. The NDX variable is a numerical value that represents the average number of diagnoses that were recorded on the health record during the patients’ encounter. The response values for the NDX variable were separated into two categories: 0 indicating that no diagnoses were coded on the record, and 1 through 30 for codes that included primary and secondary diagnoses. Quantitative, secondary analysis was conducted using the Healthcare Cost and Utilization Project (HCUP) National Inpatient Sample (NIS) of 2012. The project sample size was based on 1,000 NIS discharge cases. Analysis of variance (ANOVA) and Independent sample t-tests were conducted, using an alpha level of 0.05, to determine whether or not the results were statistically significant. The Independent t-test presented results for the average number of diagnoses compared to primary payer, and we found that there was significance between these two variables. On average, patients covered by Medicare had the highest average number of diagnoses coded on discharge (NDX=12.0). The ANOVA test indicated that there was no statistical significance between the average number of diagnoses in relation to median household income and average length of stay. In conclusion, we suggest further in-depth research and analysis of these findings in a larger set of data.
37. **Burton, Stephanie**

**L3 Acquisition in Heritage Bilinguals of Spanish and English**

*Undergraduate - Department of Hispanic and Italian Studies*

Third language (L3) acquisition is the process of acquisition of a non-native language by individuals who have acquired in the past or are acquiring two or more languages, regardless of whether or not the acquisition of a language is simultaneous or consecutive (Hopp, Kieseier, Vogelbacher, & Thoma, 2018). Studies focused on L3 acquisition aim to provide an answer to what mechanisms push for linguistic transfer from one language to another and which variables are ultimately responsible for such transfer (Cabrelli Amaro, In Press). The study of multilingualism through L3 acquisition has provided the field of education with tools to better understand the population of Heritage speakers of Spanish in the US education system (Rothman, González-Alonso, & Puig Mayenco, in press). As the field of L3 acquisition grows and develops, as will the impact that such evolution will have on understanding fields such as neuroscience, L2 research, global politics and many more.

38. **Carmona, Rebbeka; Park, Christen E.; Toledo, Ruby; Torres, Luz; Silver, Callie; Ponce, Ernesto D. and Zinsser, Katherine M.**

**Inside & Out: Emotion teaching in preschool classrooms and outdoor play**

*Undergraduate - Psychology*

Preschool teachers play a critical role in supporting young children’s social and emotional development. Prior research has focused on teachers’ in-class teaching practices, but there is almost no work measuring their social-emotional teaching strategies outside of the classroom during outdoor and gross motor play. The less structured, dynamic, and social natures of outdoor play present numerous opportunities for teachers’ to engage in teaching practices such as the modeling of, responding to, and instructing about emotions. Further, outside of the confines of the classroom, teachers’ interactions with children may be more social and contribute more to positive teacher-child interactions. At the same time, outdoor free play may present more opportunities for child misbehavior and teachers’ actions may focus less on building emotional competence and more on reducing children’s risk-taking and aggression. Thus, outdoor play is ripe for observation. This project is part of a larger study validating the EMOTERS, an observation measure of emotion teaching in indoor preschool classrooms. Two research aims drive this work: 1) identify and describe the emotion teaching strategies employed
during outdoor play: 2) assess whether teachers’ teaching strategies of emotion outdoors is associated with their in-class emotion teaching. Nine teachers were observed with the EMOTERS tool during normal in-class time and outdoor or gymnasium-based gross motor play (both called “outdoor” for simplicity). In-class observations were done via video while outdoor observations were conducted live. Overall, teachers received scores below 60% across all four constructs for both in-class and outdoor observations. Across all constructs, modeling and relating appeared easiest while responding and instructing were more difficult. Notably, teachers modeled less negative emotions outdoors. Correlations of in-class and outdoor observation EMOTERS scores show limited associations. For in-class observations, teachers who expressed more positive emotions also expressed more negative emotions. Outdoors, positive modeling is positively associated with responding and negative modeling is positively associated with instructing. All other constructs are unrelated. Findings indicate that there is room for improvement in teachers' outdoor teaching practices to promote children’s emotional competence. These research findings can provide important information that can help create effective social-emotional teaching curricula and benefit professional teacher development.

39. Castro, Angelica

What are the effects of limited mental health clinics for minority/lower income populations in Chicago?

Undergraduate - Psychology

The increase of gun violence in Chicago has sparked a conversation on the need for mental health clinics to be available to those most affected by the violence. However, the mayor of Chicago Rahm Emanuel has closed half of the mental health centers which are run by the city. Many of the clinics that have been shut down were in neighborhoods that have disproportionately high rates of gun violence. These neighborhoods are also home to a disproportionate number of minority families, specifically African Americans and Latinos. The few health clinics that are available are understaffed with high demand. This literature review will look at the relationship between gun violence and mental health in Chicago with an eye toward ways to improve this dynamic. Specifically, the demographics of mental illness, in particular, trauma, depression and anxiety, will be reported, as well as other factors that may be linked to residing in neighborhoods with high rates of gun violence. This will be done through a literature review of past research that has been done pertaining to this subject. The discussion will focus on the implications of these data for improving access and quality of mental health services on the south and west side of Chicago.
40. Cazarin, Iván; Robledo, Nicolas and Garcia, Giovanni

**Chicago's $1 Large Lots: Localizing Economic Redevelopment**

*Undergraduate - Public Policy*

The Chicago $1 Large Lots Program has dual goals: to give local residents greater control over vacant land in their neighborhood and land to the city’s tax rolls. To reduce the number of vacant lots and promote localized economic redevelopment, the City of Chicago should reform its Large Lots Program to allow renters to participate, and to mandate primary residence within the given community. The neighborhoods with a large number of vacant lots in the program include Englewood, East Garfield Park, and South Chicago, all of which are predominantly Black and Latino neighborhoods. These neighborhoods also have high rates of renters occupying available housing units. For example, in Englewood, the neighborhood in which the Large Lots Program started, 74.3 percent of occupied housing units were occupied by renters. In East Garfield Park, that number is 77 percent, and in South Chicago, renters occupied 61.7 percent of occupied housing units, compared to 55 percent of occupied housing units occupied by renters in Chicago and an overall 44 percent renter rate in Cook County.

Because Black and Latino homeownership rates are 29 percent and 26 percent lower than their white counterparts, the program disproportionately excludes renters of color, limiting this opportunity to property owners systematically excludes the majority of people who live in these neighborhoods. These same communities often face disproportionate property tax burdens; for example, the effective property tax rate in the Englewood neighborhood in 2017 was more than twice the rate of Cook County. The subsidized $1 deed to the vacant lot helps mitigate historically racialized property tax rates in low-income communities of color by allowing access to land-ownership at a significantly reduced cost.

41. Cerda, Andres

**Immigration in Spain and France: A Comparative Study**

*Undergraduate - Political Science*

This research focuses on immigration and the ways in which two European countries, Spain and France, have responded to demographic changes caused by the movement of peoples into their respective territories. Through thorough investigation of public opinion studies, such as the Eurobarometer surveys, as well as historical, economic, and cultural factors, the contemporary political debate
surrounding immigration in each of these two countries is studied and contextualized employing a comparative approach. Special attention is also paid to the popularity (or lack thereof) of right-wing, anti-immigrant parties and to a subnational examination of anti-immigrant sentiment. Analyzing these components cross-regionally should result in a more nuanced understanding of each nation’s stance on immigration. These regional case studies also serve to facilitate explanations for regional variance regarding immigration.

42. Chacko, Anjali; Funkhouser, Carter; Maki, Pauline and Shankman, Stewart

The Moderating Effect of Sex on Startle Response to Threat in Those with and without Social Anxiety Disorder

Undergraduate - Psychology

While previous research has investigated the differences in anxiety between males and females, none have specifically inquired into how biological sex or the use of birth control may moderate a startle response to threatening stimuli in those with and without social anxiety disorder. We ran analyses on data collected as part of a larger NIH-funded study. We used electromyography data collected during a threat-of-shock task that had three conditions: no threat, predictable threat, and unpredictable threat. During an interview, the participants provided demographic and health information and were assessed for social anxiety disorder using the SCID-5. Females had a significantly higher overall startle magnitude. Whether one had lifetime or current social anxiety disorder vs. no history of social anxiety did not significantly affect startle responses to threat. We found a significant effect of birth control on startle response to threat in females. We also found a two-way interaction between biological sex and social anxiety disorder when we controlled for the use of birth control, such that males with a lifetime history of social anxiety disorder had significantly lower startle magnitudes than males without social anxiety disorder, but females with social anxiety disorder had a higher startle response than females without social anxiety disorder. The significant effect of birth control, which led to a heightened startle response, sheds light on the connection between birth control and social anxiety disorder and will hopefully lead to further study on the effects of birth control on anxiety in females. The two-way interaction between social anxiety disorder diagnosis and sex could indicate different biological mechanisms for social anxiety disorder within males and females. Further investigations may elucidate why females are more likely to be diagnosed with social anxiety disorder.

43. Withdrawal
44. Chaudhari, Binjal

**Executive Orders: An Analysis from Washington to Trump**

*Undergraduate - Political Science*

President Barack Obama famously said, “I’ve got a pen and I’ve got a phone- and I can use that pen to sign executive orders and take executive actions and administrative actions that move the ball forward.” Executive orders allow a President to unilaterally invoke the force of law. This power of the president is not explicitly stated in the U.S. Constitution and thereby is an implied power of the president. The usage of executive orders by presidents has increased since the ratification of the Constitution. In this paper, I divide the Presidents into four different time categories: Washington to Lincoln, Roosevelt to Wilson, Franklin D. Roosevelt, and Truman to present to analyze the uses and circumstances of executive orders.

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45. Chokshi, Dhara and Hershberger, Patricia

**Truth Disclosure Within Families Who Have Adopted or Undergone Assisted Reproductive Technology (ARTs) Such as Receiving Donor Eggs, Donor Sperm, Embryos, or Conceiving Children Through In-Vitro Fertilization**

*Undergraduate - Health Systems Science*

Assisted reproductive technologies (ARTs) such as egg donors, sperm donors, embryo donors, in-vitro fertilization (IVF), and adoption have become more common throughout the United States and the United Kingdom. Parents have adopted a more open perspective on sharing conception methods with their children. This literature review summarizes a sample of nine research articles that were collected using multiple scholarly databases and were examined concerning the current disclosure patterns among parents who had undergone assisted reproductive technology. The Hershberger Manuscript template was used to extract and organize data from seven articles based in the United States and two articles based in the United Kingdom according to the five interrelated dimensions mentioned in the template. Findings indicated that parents who had adopted their children were more likely to disclose origins to their children. Parents who had gamete or embryo donors did not plan on disclosing. Parents who had undergone in-vitro fertilization were the least likely to tell or were the most conflicted about disclosure. This study revealed that disclosure was a difficult topic for parents as many were unsure of how to tell and what the right age was to tell. Parents were reluctant on disclosure due to fear of losing a functioning family unit as well as hurting the child. Furthermore, this study helped identify a need for assistance and support in families who had trouble determining the best disclosure methods to their children.
The Effects of Graph/Text Contradiction on Reading Comprehension and Interpretation Skills

Undergraduate - Psychology

Prior research suggests that undergraduates are readily able to notice contradictions between two pieces of texts, but it is less known to what degree they can notice when a text and graph do not agree (Blanc, Kendeou, van den Broek & Brouillet, 2008; Braasch, Rouet, Vibert & Britt, 2012; Stadtler, Scharrer, Brummernhenrich & Bromme, 2013). Additional prior work has resulted in participants often not noticing the differences between the texts and graphs, especially when they had to generate text-based inferences and when graphs were more complex (Burkett, Goldman & Britt, 2014; 2017; Burkett, Goldman, & Chang, 2018). In addition to graph complexity manipulations, the prior work on this topic has involved different types of contradictions (i.e., the text and graph depicting opposite linear trends and the graph having reversed axes resulting in opposite interpretations). The purpose of the proposed study is to extend prior work and determine if participants can reliably identify what is contradictory between a text and graph when explicitly told the material is contradictory. This will be compared for different types of contradictions as well as when the graphs are more or less complex. The study will use a 2x2 mixed design to see if graph complexity (between subjects) or type of contradiction (within subjects) is related to participants’ ability to determine what is contradictory about the pairs. Participants will be notified ahead of time that there is some type of discrepancy between the graphs and the text and will record what is contradictory between the two through multiple choice options. Decision time will be recorded and participant will also be instructed to rate how confident they are in what they answered. All scores will be calculated and further analyzed. The researchers predict that decision time will be longer while contradiction identification and confidence ratings will be lower for more complex graphs. The same pattern is expected for flipped axes contradictions as compared to linear trend contradictions.

Synchrony Effects on Creative Idea Generation

Undergraduate - Psychology

This study examined whether time-of-day affects generating more or less creative ideas on an alternative uses task (AUT, Guilford, 1957). Researchers have found that most tasks that require focused attention are performed better during an
individual's optimal time of day, which is known as the synchrony effect. In contrast, some studies have found that tasks that require finding remote, creative solutions can be performed better at a suboptimal time of day, which is an asynchrony effect (May, 1999; Wieth & Zacks, 2011). This project tested whether asynchrony or synchrony effects may be seen on an open-ended creativity task. Undergraduate students (ages 18-21) in Introduction to Psychology at UIC participated in this study. The sessions took place either between 8-10am or 5-7pm. Individuals had 3 minutes to generate alternative uses for a spoon. They also completed a demographic background survey including the Morningness-Eveningness Questionnaire (MEQ, Horne & Ostberg, 1976). AUT responses were coded in several ways: fluency (number of responses), novelty (subjective ratings on a 5-point scale), and number of highly novel responses. Results suggested both a synchrony and an asynchrony effect. There was some evidence for an asynchrony effect in which participants who reported morning as their optimal time tended to give a greater number and more novel AUT responses during the evening sessions than participants who reported their optimal time as later in the day. However, there was also a trend toward a synchrony effect. Participants who reported evening as their optimal time tended to give more novel AUT responses during the evening than during the morning sessions. One key difference between the present study and those that have found clearer asynchrony effects is that prior work has used single-solution puzzle tasks, while this study used an open-ended idea generation task.

48. Collins, Aja

How Culhwch and Olwen Reflects the Fears and Fantasies of the Celtic Tribal Elite

Undergraduate - English

My Projector Supervisor approved Capstone project is an extension of a paper I wrote in a course that Professor Thomas teaches, called Topics in Medieval Literature (listed as ENGL 408 in the undergraduate course catalog). It will describe how Culhwch and Olwen – the oldest surviving Arthurian tale – reflects the fears and fantasies of the Celtic tribal elite. I will delve into the specifics of how patriarchy was the backbone of the Celtic tribal elite's fears and fantasies. My thesis will specifically focus on how women were viewed within the story.

49. Conley, Erin; Costa, Maria Sofia; Lee, Jeongho; Ma, Rui and Murphy, Brian T.
High-throughput bioassay to explore antibiotic potential of aquatic Actinobacteria from Iceland

Undergraduate - Medicinal Chemistry and Pharmacognosy

Bacteria produce small molecules with diverse biological roles, which historically have served as fruitful sources of antibiotics. However, the discovery of novel antibiotics has slowed drastically in recent decades, while rates of antibiotic resistance have increased exponentially. We hypothesize that analyzing small molecule production in understudied bacterial genera will increase our likelihood of uncovering new chemical space, and potentially novel antibiotic compounds. From a set of understudied aquatic Actinobacteria from Iceland, we used matrix-assisted laser-desorption ionization/time-of-flight mass spectrometry (MALDI-TOF MS) and the IDBac bioinformatics platform to select a subset of environmental bacterial isolates that exhibited distinct patterns of small molecule production. To expedite bioactivity screening, we developed a high-throughput bioassay that allows for growth inhibition analysis of up to 48 bacterial isolates in a single step, using a custom 3D-printed plate. Using this assay, our subset of bacterial isolates was analyzed for bioactivity against the prominent human pathogen Pseudomonas aeruginosa. Three bacterial isolates have demonstrated growth inhibition of P. aeruginosa, and analytical chemistry techniques are underway to purify and identify the compounds responsible for the observed antibiotic activity.

50. Cook, Alexandria; Politano, Patricia; Bond, Samantha and Brennan, Kevin

Building an Interactive Communication Tool for Better Aphasia Patient - Healthcare Professional Interaction

Graduate / Professional - Biomedical and Health Information Sciences

For patients with varying levels of communication disability, augmentative and alternative communication (AAC) methods can be a vehicle for self-expression and understanding. AAC is used in order to aid in communication breakdowns that occur in the home setting, therapy sessions, and various functional communication settings. Patients with aphasia are among the population who rely on AAC in order to communicate due to a significant loss in linguistic function. Aphasia exists across a spectrum of severity and no one AAC tool fits the needs of every aphasic patient. Because of this, the types of AAC have become numerous and diverse. An individual with aphasia may use a variety of AAC methods depending on the type of interaction. Non-electronic tools such a paper communication boards are more commonly used in the care setting and are inherently limited in their ability to accommodate a wide range of individuals. Until the patient with aphasia regains primary communication skills, a significant amount of autonomy is lost. A critical example of this exists in the care setting. Patients with aphasia rely on their
caregivers to communicate complex medical information efficiently and effectively; however, significant health information can be lost when the patient is not involved in their medical decisions. This can lead to adverse care outcomes including death. This research study aims to increase the level of comfort healthcare professionals have when communicating with patients with aphasia. This will be accomplished by providing an intuitively designed application that will increase overall confidence in their practice. Ultimately, it will create more opportunities for patient autonomy.

51. Corbiere, Thomas; Weinheimer-Haus, Eileen; Judex, Stefan and Koh, Timothy J

Locally-applied low-intensity vibration improves healing in a mouse model of laceration injury

*Graduate / Professional - Kinesiology and Nutrition*

Background: Recovery from traumatic muscle injuries is typically prolonged and incomplete, leading to impaired muscle and joint function. Low-intensity vibration (LIV) has shown promise as a non-invasive treatment for traumatic muscle injury. We sought to determine the effectiveness and optimal delivery method of LIV for the treatment of laceration injury in mice. Methods: C57BL/6J mice were subjected to a laceration of the gastrocnemius muscle and were treated with either whole-body LIV (WBV, n=14-16) or locally-applied LIV (LV, n=11-12) of 0.2 g at 90 Hz or non-LIV sham treatment for 30 min/day over 14 days. Muscle regeneration was assessed in hematoxylin and eosin stained muscle cryosections. Results: Compared to non-LIV control mice, the myofiber cross-sectional area was significantly larger in mice treated with either WBV (+161.8 +/- 64.4 μm², p < 0.05) or LV (+81.2 μm² +/- 32.2, p < 0.02) after 14 days. Similarly, minimum fiber diameter was significantly larger in mice treated with either WBV (+2.0 +/- 0.9 μm, p < 0.05) or LV (+2.0 +/- 0.4 μm, p < 0.001) after 14 days. Furthermore, mice treated with LV showed an increase in the area of peripherally-nucleated myofibers (+6.1 +/- 2.9%, p < 0.05) and a decrease in damaged myofiber area (-8.3 +/- 4.0%, p < 0.05) while no changes were seen for these measurements with WBV. Neither treatment had any effect on myofiber count. Conclusions: Although both LIV applications demonstrated increases in myofiber growth, locally-applied LIV appears to have a more significant impact by reducing the damaged area within the injury. These data suggest that LIV may represent a novel therapeutic approach for improving the healing of traumatic muscle injuries via local effects in the muscle tissue rather than systemic mechanisms.

52. Corbin, Pratilia
Acupuncture therapy as symptom management for stable angina in an American Male

Undergraduate - Biobehavioral Sciences

There has been research showing that a large portion of the population with stable angina reporting that they do not have controlled symptoms, which impacts their quality of life. Some symptoms of stable angina are chest pain or discomfort described as a burning, squeezing, or pressure sensation, pain in the back, neck, jaw, shoulders accompanied by chest pain, shortness of breath, nausea/vomiting, sweating, or dizziness. All of the listed symptoms, when uncontrolled, can lead to decreased quality of life, decreased satisfaction in life, decreased mobility, increased risk of depression, and increased risk of heart attack. The current regimen for symptom control of stable angina is not adequate. Stable angina is currently being treated mainly with pharmacological methods (i.e. Beta-blockers, Calcium channel blockers, Angiotensin-converting enzyme inhibitors, Nitrates) in Traditional Western Medicine in the United States of America. There is a constant growing need of symptom management of individuals experiencing angina symptoms in the United States. Globally, there has been use of acupuncture as treatment management for other health ailments unrelated to cardiovascular systems. Acupuncture promotes analgesic effects without use of harmful chemicals. This treatment also has lower and less harmful side effects compared to traditional pharmacologic treatments. The purpose of this study was to analyze the effects of acupuncture as an additional non-pharmacological form of symptom management for stable angina. The participant underwent 10 sessions of acupuncture, 2 times a week for a total of 5 weeks as a complementary therapy for symptoms of stable angina. The participant received 10 acupuncture treatments (2x/week). Severity of pain was measured before and after each session, as well as least and worst pain in the 24-hour period before a treatment session. I was allowed the analyze the long term and short-term effects of acupuncture on the participants severity of pain.

53. Cortes, Katia

Rudy Lozano: The Political and Social Fight for the Latinx Community in Chicago

Undergraduate - Honors College/ Political Science/ Latin American and Latino Studies

The influence of Rudy Lozano in Chicago--> How he was involved politically and socially for the rights of minorities and the Latinx community in Chicago. As a UIC alum, Rudy Lozano's personal and political papers are housed in the UIC Special
Collections unit. My project is based on his papers and attempts to illustrate the work he did for his community and for Chicago as a whole.

54. **Cruz, Valeria** and **Patil, Crystal**

**Perspectives on Hematopoietic Stem Cell Transplant Success**

*Undergraduate - Spanish*

Sickle cell disease (SCD) is genetically inherited blood disorder with complex and often devastating short and long-term effects. It is estimated that about 100,000 people are living with SCD in the United States. In the last two decades hematopoietic stem cell transplantation (HSCT) has successfully cured SCD. We conducted a qualitative study to investigate how healthcare providers define HSCT success. We interviewed 4 doctors, 1 nurse, and 1 social worker who provide healthcare to HSCT patients. While there was no consensus in their definitions, each emphasized that compliance, and social, psychological, and financial support was important. Researcher used a strict biomedical definition of at least 20% stable chimerism values a year post-transplant along with the patient being completely off immunosuppression as a successful transplant. The nurse focused on patients’ momentary needs. The primary treatment doctor and social worker presented the most holistic definition of success that included post transplant physical health and quality of life. The HSCT experience is deeply complex. Our research sheds light on the fact that healthcare professionals may need more contextualization to this as they consider transplanting their patients. In sum, our results highlight that the HSCT experience can be improved by implementing coordinated and comprehensive care that acknowledges the participant in a larger social world. A thorough assessment of patient needs should be done in order to account for all variables that play a role in shifting the outcome of HSCT along the success-failure continuum, and appropriate support should be given to HSCT recipients in order to facilitate the difficult social, psychological and financial transition post-transplant.

55. **Czarny, Jordyn; Mesnard-Hoaglin, Nichole; Morris, Sarah and Brady, Scott**

**Determination of pathogenic tau-induced morphological changes in primary neurons**

*Undergraduate - Biological Sciences*
Alzheimer’s Disease (AD) is an adult-onset neurodegenerative disease affecting specific types of neurons within the central nervous system. An axon is a long projection from the neuronal cell body where electrical conduction for neuron-to-neuron communication and axonal transport (AT) for the movement and delivery of intracellular cargo occur. AT moves bidirectionally along the axon through the axoplasm (axonal cytoplasm), either away (anterograde) or toward (retrograde) the cell body. In AD, aggregated forms of the microtubule-associated protein tau are pathological hallmarks, and neuronal axons display a dying-back degeneration pattern. Using our isolated axoplasm model from the squid giant axon to examine AT, we previously found inhibition of anterograde fast AT when pathogenic tau was present. In its native form, tau is folded into a “paper clip” conformation, where the N- and C- termini are folded on top of each other. Pathogenic tau has an altered conformation in which the “paper clip” unfolds, exposing a region in the N-terminus we identified as the phosphatase-activating domain (PAD), comprising amino acids 2-18. We determined the PAD region of tau to be responsible for the inhibition in AT. The hypothesis of the current study is that the exposure of the PAD in pathogenic tau will result in axonal degeneration, due to inhibition of AT. Primary hippocampal and cortical neurons, isolated from embryonic rat and mouse brains, are transfected with pathogenic tau or pathogenic tau with the PAD removed. The neurons will be analyzed by live cell imaging at various time points to examine morphological changes in response to the transfections. We anticipate observing aberrant morphological changes in neurons expressing the pathogenic tau, but not with the pathogenic tau containing the PAD deletion.

56. Dang, Kim Chi and Adami, Guy

**Review of the Effects of Green Tea Extract**

*Undergraduate - Biology*

Green tea (GT) is one of the most popular drinks globally and is thought to have beneficial results on one’s health. The active molecules in green tea, that are often the main focus of attention in such studies, are caffeine and catechins, especially catechins. Catechins are polyphenols which are thought to have a beneficial effect on health; specifically in green tea, these catechins are epigallocatechin-3-gallate, epigallocatechin, epicatechin gallate, and epicatechin(1). In certain studies, the consumption of green tea has even been thought to prevent certain types of cancers or hinder the progression of cancer. However, clinical trials analysis has have conflicting results (Fritz, 2013 #112; Yang, 2016 #114; Zhang, 2014 #76) On the other hand, the majority of published studies in rodents have provide clear-cut evidence that GT or purified GT catechins have the ability to prevent and reduce morbidity to a range of cancers in laboratory animals (Liang, 2007 #309; Ju, 2007
This effect happened whether the GT was introduced during the carcinogen exposure, 1 week after carcinogen exposure, or 20 weeks later, when the earliest neoplastic growths started to appear {Lu, 2006; Lu, 2006}. These and experiments like them are the best evidence that GT blocks all steps of the carcinogenesis process and is not chiefly a reducer of oxidative carcinogens {Yang, 2009}. At the same time, this evidence also highlights the riddle of poor results with GT-induced cancer prevention in humans.

57. **David, Caitlin; Mount, Kristin; Lebowicz, Leah; Keillor, Tyler and Brennan, Kevin**

**Three Dimensional Reconstruction of a Polypterid Cranium**

*Graduate / Professional - Biomedical Visualization*

Dr. Paul Sereno of the University of Chicago has, with his lab, uncovered a fragmented fossilized skull thought to belong to a Cretaceous relative of modern day bichirs. While the specimen has not yet been identified with complete certainty, its morphological characteristics have led Dr. Sereno to place it within the family Polypteridae. Although Dr. Sereno’s lab has partially assembled parts of the skull, it would benefit greatly from three-dimensional virtual reconstruction. The reconstruction could then be used to learn more about this newly discovered species, placing it more firmly in the phylogeny of ancient fishes and in Cretaceous ecology. However, because of the specimen’s uncertain identity, care must be taken when determining how to fill in its missing pieces. A large part of this research has been an investigation of related species and a determination of what decisions lead to the best reconstruction.

A fossil specimen of a new species presents an opportunity to discover new information. First, the species itself must be defined and described in detail. Basic questions regarding its morphology, behavior, and potential ecology can be answered by extrapolating from this analysis. Second, the species should be related to other known species in order to extract more meaningful information from the fossil. In this case, the fish is thought to be related to extant polypterids, or bichirs, a group whose exact phylogeny has been disputed. By reconstructing this specimen, we may shed some light on the earlier lineage of polypterids in general. Studying the morphology of a new specimen will add to our knowledge of early polypterids and could provide clues relating polypterids to other groups.

58. **David, Brianna; Wenzel, Elizabeth; Dowty, Shannon; Bernabe Peñalver, Beatriz and Maki, Pauline**
Perinatal Anxiety in the First and Second Trimester and the Inflammatory Response

Undergraduate - Biological Sciences

An estimated 15% of women are affected by perinatal anxiety (Fairbrother et al., 2016). Perinatal mental disorders can lead to preterm birth and low-birth weight (Ding et al., 2014; Stein et al. 2014). Certain inflammatory cytokines have been associated with depression, stress, and anxiety, and this inflammatory response can lead to miscarriage or mental and developmental disorders in the fetus later in life (Carp, 2004; Glynn et al., 2018). These consequences can be avoided with early interventions (Stein et al., 2014). Specifically, inflammatory cytokine IL-1β has been associated with depression in both pregnant and non-pregnant populations (Corwin et al, 2008; Johnson et al., 2008; Young et al., 2014), and inflammatory cytokine IL-6 has been associated with anxiety disorders in non-pregnant populations (Hou et al., 2017). The goal of this study was to examine the inflammatory response in pregnant women with perinatal anxiety over time. It was predicted that inflammatory cytokine levels would be higher in those exhibiting anxiety symptoms compared to those without anxiety. It was also predicted that inflammatory cytokine levels would be positively correlated with anxiety severity. 24 pregnant women (50% Black, 29% Latina, 17% white, 4% Asian) were involved in this study. During their first and second trimester visits, the CAT-ANX (Computerized Adaptive Testing for Mental Health) and the GAD-7 (Generalized Anxiety Disorder questionnaire) were administered and used to determine if a participant had perinatal anxiety. Blood was also collected for cytokine analysis. There was no main effect of visit or anxiety condition on IL-6 or IL-1β levels (p=0.144 and p=0.073, respectively). No significant results were found, but the data was trending towards what was predicted. As for the future, more research on solely IL-6 in pregnant populations is sorely needed.

59. Debruyn, Claudia

A Cross-Cultural Comparison on End-of-Life Care between the Netherlands and India

Undergraduate - Philosophy

End-of-life (EoL) care, the prevention and relief of suffering, is shaped by values, norms, tradition, and belief systems. How societies make decisions about healthcare at the end-of-life have increasingly become a matter of public policy and of ethical debate. Social differences between and within countries create tension between values and practices in EoL care, especially in regard to physician-assisted suicide. This study’s aim is to examine how different social approaches at EoL care reflects patients’ culture and moral beliefs. In order to do this, this
systematic review identified the characteristics of EoL decisions in the Netherlands and India. After review, it is clear that as India is undergoing increasing urbanization, and Western values grow in influence, medical practices are drifting from traditional Hindu beliefs. India is reconsidering how traditional religious beliefs apply to increasingly modern EoL care, leading to increased debate over physician-assisted suicide. Meanwhile, the Netherlands struggles with integrating non-Western patients into its society. It also faces problems in adherence to standards of physician-assisted suicide. Because of the importance of culture, the challenge for the healthcare professional is to learn more about how culture influences a patient’s perception of healthcare issues and thus be able to offer culturally sensitive quality medical care to a patient whose background may differ from that of the care provider.

60. Desai, Moneal and Atluri, Venkat

**Optogenetic Interrogation of Neural Networks that Determine Place Aversion**

*Undergraduate - Anatomy and Cell Biology*

In this study we test the hypothesis, glutamatergic interpeduncular nucleus (IPNL) neurons regulate motor activity associated with aversive or stressful stimuli. In mice, the main response to stressful stimuli is place aversion. Mice avoid places associated with danger or stress. To test this hypothesis, we optically stimulate glutamatergic neurons in the IPNL in transgenic mice expressing channelrhodopsin2 (ChR2). The transgenic mouse model, surgical procedure for implanting optic fibers, and behavior assay have been tested. In our preliminary experiments, we find that optical stimulation of IPNL neurons in adult mice results in place aversion. The goal moving forward is to further confirm this finding and to use appropriate controls to ascertain the effects of optically stimulating IPNL neurons in place aversion assays.

61. DeSisto, Carla

**The effect of continuous versus pregnancy-only Medicaid eligibility on postpartum care in Wisconsin, 2011-2015**

*Graduate / Professional - Epidemiology and Biostatistics*

Introduction: It is recommended that women schedule a postpartum visit 4-6 weeks after delivery. Wisconsin Medicaid covers all adults up to 100% of the federal poverty level (FPL), as well as pregnant and postpartum women up to 306% FPL. However, it is unknown if postpartum care utilization varies by Medicaid eligibility category (i.e. continuous coverage versus pregnancy-only eligibility).
Methods: We used Medicaid records and infant birth certificates for Medicaid-paid births in Wisconsin during 2011-2015 (n=105,718). We used the Medicaid eligibility file to determine if women had continuous or pregnancy-only eligibility. We used a standard list of billing codes to identify if women received postpartum care from Medicaid claims. We examined maternal characteristics from the infant birth certificate, as well as receipt of postpartum care, overall and by Medicaid eligibility category. Finally, we used a binomial model to calculate the relationship between Medicaid eligibility category and receipt of postpartum care, adjusted for maternal characteristics, using risk differences and 95% confidence intervals.

Results: Approximately 75% of women had continuous Medicaid, while the remaining 25% had pregnancy-only Medicaid. Women with continuous Medicaid had profiles more consistent with low postpartum visit attendance rates than women with pregnancy-only Medicaid (e.g., they were younger, less likely to be married, and more likely to use tobacco). Despite these characteristics, women with continuous Medicaid eligibility were more likely to have received postpartum care than women with pregnancy-only Medicaid. After adjusting for maternal characteristics, women with continuous Medicaid eligibility had a postpartum visit rate that was 6 percentage points higher than the rate for women with pregnancy-only Medicaid (RD: 6.27, 95%CI: 5.72, 6.82).

Conclusions: Women with pregnancy-only Medicaid were less likely to have received postpartum care than women with continuous Medicaid. Medicaid coverage beyond 60 days postpartum could help assure that more women have access to postpartum care.

62. Desmet, David; Westbrook, Aaron D and Grabiner, Mark D

Treadmill-Belt Width, But Not Feedback from The Lower Visual Field, Influences Noise Characteristics of Step Width Time Series During Treadmill Walking

Graduate / Professional - Kinesiology and Nutrition

Introduction: Fractal scaling of step kinematic time series is thought to reflect neuromotor noise. We have shown that increasing neuromotor noise through increased cognitive load decreases fractal scaling of step width time series. Purpose: This study determined the effects of eliminating feedback from the lower visual field and reducing the width of the walking surface on step width, a linear measure of step width variability and the fractal scaling of step width. We hypothesized that reducing lower visual field feedback and decreasing treadmill-belt width would decrease fractal scaling of step width time series. Methods: Eighteen healthy, young adults performed four walking trials in which visual feedback (normal and reduced) and treadmill-belt width (wide and narrow) were
manipulated. Visual feedback was reduced using a commercially available device that blocked the lower one-third of the visual field. The wide and narrow treadmill-belt widths were administered using a dual-belt treadmill. Step width time series were extracted from each trial using motion capture technology. The mean and standard deviation were computed, as were two measures of fractal scaling of the time series using (1) the autocorrelation of the time series (β) and (2) detrended fluctuation analysis (α).

Results: The narrower treadmill-belt condition significantly increased β and decreased α, step width and step width variability (p < 0.05). Reduced lower visual field feedback did not significantly affect any of the outcome measures.

Discussion: The results reveal that reducing the width of the treadmill belt shifts the noise characteristics of step width time series towards white, uncorrelated noise. The results also suggest that the fractal scaling of the step width time series is not influenced by feedback from the lower visual field. The effects of other sources of visual feedback, for example, peripheral vs. focal, were not addressed in the present study.

63. Diaz, Leslie; Pichardo, Catherine and Molina, Yamile

**Perceived Risk, Objective Risk, and Health Protective Behaviors among Latinas Enrolled in Breast Health Interventions**

*Undergraduate - Community Health Sciences*

Introduction: Breast cancer is the most common form of cancer that targets Latinas. Multiple approaches have sought to promote health protective behaviors among Latinas, including through means of prevention (e.g., diet, physical activity (PA)) or early detection (e.g., mammography). Risk perception is a theoretical factor that might explain these health behaviors. However, risk perception among Latinas is complex and its role within health behaviors has not been consistently reported. Our study will characterize women’s health behavior change in breast health interventions and explore whether risk perception predicts behavior change across time.

Methods: Our study includes 105 Chicago-based Latinas who were non-adherent to mammography guidelines, participated in 3-week breast health interventions, and completed 1-5 monthly postintervention calls. Predictor variables were average perceived risk (low, medium, high), perceived risk change (decreased, similar, increased), family-based risk (none, any), hormone-based risk (none, any), and behavioral-based risk (none, any). Outcome variables were diet change (none, any), PA change (none, any), and mammography uptake (none, any).

Results: Among 105 women, the average age was 61.25 (SD: 6.74); 84% were born in Mexico; 61% had <9th grade education; 66% had an annual household income of <$10,000; and, 42% were uninsured. For risk perception, 47% reported a medium perceived risk; 59% reported a similar perceived risk; 23%
reported family-based risk; 70% reported hormone-based risk; and, 100% reported behavior-based risk. Approximately 84% reported postintervention diet change; 95% reported postintervention PA change; and, 76% received a mammogram. Risk perception was largely not related to behavior change, except for an association between hormone-based risk and diet change (OR=3.65, 95%CI [1.02, 13.05], p=0.05). Discussion: Many women changed diet, PA, and mammography behaviors across time. However, risk perception was largely not related to behavior change, possibly because of structural and contextual factors that may have had a larger influence over access to healthy spaces and foods.

64. Dihan, Qais

Syrian Refugee Resettlement: Analysis and Impact in the USA

Undergraduate - Arabic

For over 7 years now, the Syrian Civil War has been an ongoing crisis and the cause of displacement for hundreds of thousands of civilians from their homeland. Throughout this 7 year period, Syrian refugees have already resettled and lived in countries around the world for a number of years. Media dialogue and an information frenzy have made various claims regarding refugee populations and their potential impact on the places they resettle. This project seeks to sort through existing evidence, and make objective evidence based claims. It analyzes the impact of Syrian refugee resettlement in other nations, and extrapolates the potential impact it would have on the economic, social, and political spheres in the United States.

65. Durowade, Tejumade; Lambert, Andrew; Nuñez, Amanda: Esteban, Garcia and Romero, Antonio

Object Oriented Micro-Magnetic Framework Simulations of Circular Rings for Quantum Cellular Automata

Graduate / Professional - Electrical and Computer Engineering

The continued scaling of CMOS transistors has resulted in revolutionary advances in many fields of science. Going beyond the current state of the art process node represents the proverbial hitting of the wall as quantum mechanical effects begin to dominate transistor operation. Continued scaling in accordance with Moore’s Law would require mitigation of the physical and technological challenges while improving performance. This, however, is extremely difficult since the economic costs of developing new process nodes exponentially increases with downscaling. It is therefore important to explore other technologies that can provide the much higher densities and reduced power dissipation the semiconductor industry needs.
First proposed in 1993 by Craig Lent, Quantum Cellular Automata (QCA) exploit quantum mechanical states to implement logic. Standard QCAs consist of cells arranged in pre-determined architectures designed to achieve some form of information transmission. A promising candidate for operable room temperature QCAs is micro-magnets. Magnetic QCAs are desirable for their small size, allowing them to withstand thermal fluctuations and maintain magnetization for extended periods time with packing density on the order of 1010/cm2 with. Power dissipation is extremely low since the stability of the QCA is based on the stable quantum ground states, hence the power dissipated by driving and holding a device away from its preferred ground state is eliminated. In this work, we present the results of Object Oriented Micro-Magnetic Framework (OOMMF) simulations of magnetic rings and disks that can be used as building blocks of room operable QCAs. The simulations give insight to the switching dynamics of the structures and offers more information on parameters that need to be satisfied for room temperature QCAs.

66. Dusane, Shamali and Bhatt, Tanvi

**Motor adaptation and transfer of fall resisting skills to overground slips in chronic stroke survivors**

*Graduate / Professional - Physical Therapy*

Chronic stroke survivors have demonstrated the ability to undergo motor adaptation and transfer of the reactive stepping response following repeated stance slip-like perturbations, resulting in reduced fall-risk1, 2. Given the possibility of real life slips during walking on either of the limbs, it is imperative to examine adaptation to slip-perturbation training during the task itself. This study aimed to determine whether chronic stroke survivors can acquire motor adaptation to repeated overground slips under the non-paretic limb and demonstrate immediate transfer of the acquired fall resisting skills to the untrained paretic limb. Methods: 47 community dwelling chronic stroke survivors were randomly assigned to either the training group (n=24), which received 8 unannounced, repeated slips during walking under the non-paretic limb prior to the novel slip under the paretic limb or the control group (n=23), which received a single novel slip under the paretic limb without any prior perturbation training. Participants were asked to walk on an 8-meter instrumented over ground walkway at their preferred walking speed. The computer controlled moveable platforms were used to induce slips with a maximum slip distance of 45cms. Incidence of laboratory falls and COM state stability at liftoff (LO) and recovery step touchdown (TD) were analyzed. Results: The training group demonstrated significant falls reduction and improved COM stability at LO and TD (p<0.05) following repeated slips under the non-paretic limb. Although between groups comparison demonstrated reduced falls and better
control of COM state stability at LO and TD on the novel paretic slip in the training than the control group, the differences were not significant (p>0.05). Conclusion: The results indicate that the chronic stroke survivors can acquire immediate reactive (post-slip) adaptation following repeated slip training under non-paretic limb leading to reduced falls. Moreover, they were able to demonstrate a positive trend for transfer of acquired skills from trained non-paretic limb to untrained paretic limb.

67. Earskine, Brianna and Nitsche, Ludwig

Multiscale modeling of skin absorption and transdermal diffusion of chemical and drugs

Undergraduate - Chemistry

Computer simulations of diffusion of chemicals and drugs through the outer “barrier” (stratum corneum, SC) layer of skin. This work will involve using (and possibly modifying) a Fortran code provided by Dr. Nitsche, which uses a particle-based numerical method to track solute movement through a multi-phase geometric model of the SC. Parametric study and numerical post-processing will provide effective diffusivities of representative medications and chemicals and trends thereof.

68. Edmison, Daisy; Arzuaga, Anna and Ragozzino, Michael

Maternal Stress and Prenatal SSRI Exposure on Repetitive Behaviors and Anxiety in C57BL/6 (B6) Mice Offspring

Undergraduate - Psychology

Autism spectrum disorder (ASD) is characterized by social impairments and repetitive behaviors with restricted interests (RRBs). RRBs can be exhibited as stereotyped motor behaviors or reduced behavioral flexibility. Over the past decade, the prevalence of ASD has substantially increased. Similarly, the use of selective serotonin reuptake inhibitors (SSRI) to treat depression in pregnant women has tripled. While maternal stress and SSRI exposure has been shown to affect neurodevelopment in the offspring separately, the combined effects and their interaction with genetic factors to cause or exacerbate autism symptoms is unknown. To address this knowledge gap, the present study examined the combined effects of maternal stress and prenatal SSRI exposure with fluoxetine in C57BL/6 (B6) mice (a typical inbred mouse strain). Pregnant female mice were administered fluoxetine (0.3mg/kg/day) or saline from gestational days 8-18 and subjected to a no restraint condition or restraint stress condition from gestational days 4-18 (three daily 30 minute sessions). Offspring were tested as young adults
(7 weeks of age) on self-grooming behavior (stereotyped, repetitive behavior), an elevated plus maze (measure of anxiety), and learning to inhibit a prepotent response in a spatial discrimination task. The results indicate restraint stress reduces preference for sucrose reward and suppresses weight gain in pregnant dams; these effects were reversed by fluoxetine. However, combined maternal restraint stress and prenatal SSRI exposure increased grooming in both B6 male and female offspring. These offspring also exhibited impaired behavioral flexibility in a spatial discrimination test. In contrast, offspring did not exhibit increased anxiety. These findings suggest the combination of maternal restraint stress, which may model depression, and prenatal SSRI exposure increase RRBs, and may contribute to autistic-like phenotypes in offspring.

69. Ehredt, Ryan

Deltadromeus Agilis: Reconstruction, Visualization, and Extrapolation of Mass

Graduate / Professional - Biomedical Visualization

The singular known specimen of Deltadromeus agilis, a theropod from the start of the late Cretaceous, exists physically as 60 or so fossil fragments. This research documents the reconstruction, visualization and extrapolation of mass of Deltadromeus for use in further visualization, animation, or examination of the species. The reconstruction tools included data segmentation in Materialize Mimics, 3D modeling programs ZBrush and 3ds Max, and multiple creature mass estimation methods to guide the process. References for the reconstruction were used in this order: fossil curvature and interactions with articulating bones, cross-body symmetry, examination of two sister taxa, spare parts of a 1997 carved foam skeletal mount of Deltadromeus, and examination of other related theropods. In addition to the creation of new mesh, fossils that were fused or covered in stone matrix have been separated for articulation. The reconstruction has been completed and deemed successful by content experts in the paleontological field. The project exists now as 250 independent meshes, for articulation purposes, and has a been saved at a variety of polygon count for use in different media. Documentation of each bone / reconstruction group and the decisions made in orientation and form were recorded and organized into a table for examination.

70. El-khateeb, Hanin; Pins, Danielle C; Muratalla, Jose; Norris, Gregory H and Cordoba-Chacon, Jose
Comparison of Diet-Induced Non-Alcoholic Steatohepatitis (NASH) in Male and Female Mice

Undergraduate - Endocrinology and Metabolism

Non-alcoholic fatty liver disease (NAFLD) is the leading cause of chronic liver disease and affects over 60 million people in the US with a higher prevalence of the disease in men as compared to pre-menopausal women. Some patients with NAFLD showed a progression to non-alcoholic steatohepatitis (NASH), a more pathological condition of NAFLD that could precede cirrhosis or liver cancer. To date, there is not a FDA-approved pharmacological therapy to treat NAFLD, and extensive research is done to understand the mechanisms that lead to the onset and progression of NAFLD and NASH. Of interest for this project, the expression of hepatic peroxisome proliferator-activated receptor gamma (PPARγ) is positively associated with the progression of NAFLD and NASH in mice and humans. We have shown that hepatocyte PPARγ expression is required to develop diet-induced steatosis (fat accumulation in the liver) with an adult-onset hepatocyte-specific PPARγ knockout (aHepPPARγKO) mouse model. We hypothesized that male and female mice have a differential response (body composition) to a steatogenic diet that induces NASH, which may be hepatocyte PPARγ-dependent. Adult male and female control and aHepPPARγKO mice were fed with a choline-deficient and methionine-restricted high fat diet (CDAHFD) or a control diet (MSDHFD) for six weeks. CDAHFD reduced body weight and adiposity in male mice. Body weight of female mice fed a CDAHFD was not significantly reduced, but adipose tissue was mildly suppressed. Independent of gender, CDAHFD dramatically increased liver weight in a similar manner. Interestingly, aHepPPARγKO mice fed a MSDHFD showed a significant increase in urogenital, mesenteric, retroperitoneal and subcutaneous white adipose tissue only in male mice. However, no additional effects of aHepPPARγKO were observed in body composition. Our ongoing studies will assess liver-specific gene expression and plasma levels of hormones and lipids that will help to understand the gender-specific differences in CDAHFD-induced NASH.

71. Elmuti, Sami and Phillips, Shane

Implications of binge drinking on cardiovascular health in young adults

Undergraduate - Kinesiology and Nutrition

Frequent alcohol consumption over years has been associated with adverse health conditions such as hypertension, cardiovascular (CV) blockage and blood vessel rigidity. However, studies have failed to identify an onset point or limit research participants to younger cohorts and therefore may be missing critical aspects to the
origin of certain CV detriments. The aim of this ongoing study is to record and compare cardiovascular factors including Aortic Augmentation Index (Alx), Blood Pressures, and Pulse Wave Velocity (PWV) to Alcohol Use Disorders Identification Test (AUDIT) scores and Phosphatidylethanol (PEth) levels in adults ages 18-30 years old who present with Abstinent, Moderate or Binge Drinking behaviors. Non-invasive blood pressure readings and pulse wave analyses at rest in conjunction with AUDIT and diet questionnaires were used to obtain readings and scores from participants. One-way analysis of variance (ANOVA) was then utilized to compare mean values from each of the three groups against mean test scores from each group to identify significant differences. From preliminary findings, no significant differences have been identified among the three subject groups although larger subject pools and re-evaluation of AUDIT testing must be examined to conclusively determine that binge drinking within this age range does not represent an onset point for subclinical CV disease and later decreases in CV health.

72. Escobar, Stephanie

Musicians Online

Undergraduate - Communications

This study will focus on how celebrities practice being a celebrity and cultivate fan communities online through what they share on social networks. Dua Lipa is a British pop singer who debuted in early 2017 with her first self-titled album. She is very active on social media (Instagram, Twitter, and Facebook). Looking at what she posts through these three different platforms allows us to see the affordances of each and how they benefit in how Dua Lipa practices celebrity online. Looking at her post from August to November, I will analyze these through a content analysis to see how Dua Lipa is able to cultivate a fan community online through three different platforms.

73. Escudero, Julianna; Arena, Anthony and Shaye, Daniel

Possible role of heterotrimeric G-proteins and EXC-4 in the regulation of Rho-family effectors in the C. elegans Excretory Canal during tubulogenesis

Undergraduate - Biological Sciences

The Shaye lab studies the cellular and genetic processes that allow the formation of biological tubes (tubulogenesis) in the nematode Caenorhabditis elegans and during angiogenesis; a process of blood vessel formation. In order to analyze tubulogenesis our lab focuses on the C. elegans excretory canal (CeEC), a single
hollow cell that elongates throughout the worms’ entire body, facilitating the observation of effects (phenotypes) that genetic modifications have on its’ development. Some genes that regulate CeEC formation are also involved in angiogenesis; for example, the gene exc-4, which encodes a chloride intracellular channel (CLIC). This gene was first discovered and studied due to its role in CeEC tubulogenesis, and its vertebrate homologs were later linked to angiogenesis. Preliminary data from our collaborators studying human endothelial (blood vessel) cells suggest a model where CLICs function in signaling between heterotrimeric G-protein coupled receptors (GPCRs) and the Rho family of GTPases (RhoA and Rac1). How exactly CLICs are regulated by, and play a role in, this pathway is still unknown. We hypothesize that, similar to observations in endothelial cells, EXC-4 may regulate Rho-family proteins during CeEC tubulogenesis. To test this hypothesis, we have studied genetic interactions between C. elegans Rho-family members (cdc-42/Cdc42, ced-10/Rac and mig-2/Rac) and exc-4. Our results suggest that CED-10 functions upstream of, while MIG-2 is parallel to, EXC-4. The Gα components of heterotrimeric G-proteins, GOA-1/Gαi and GPA-12/Gα12 also appear to play a role in this pathway. We are currently generating strains to test redundancy between the two Rac homologs and the two Gα proteins in exc-4-mediated signaling. We are also developing transgenic tools to further define the role of these players, and the remaining Rho-family member to be tested, rho-1/Rho, by creating activated forms to observe their effects on tubulogenesis of CeEC.

74. Ewa, Theressa; Martinez, Jerahme and Wang, Liyun

Expression Patterns of the Mechanosensitive Ion Channels Piezo 1 and Piezo 2 in Murine Skeletal Tissue

Undergraduate - Mechanical Engineering

Piezo1 and piezo2 are newly discovered mechanosensitive ion channels that are sensitive to mechanical stimulation such as pressure or touch. These channels have been found in various mechano-responsive tissues including kidney, lung, bladder, vasculature nerves, and skeletal tissues, at least at the transcript level. However, their protein expression pattern in skeletal tissue and their role in bone adaptive response to mechanical stimuli remain unclear. Our study aims to uncover the spatial and temporal expression of the piezo ion channels in the developing skeletal tissue of mice and determine whether their protein levels change under mechanical loading. Immunohistochemistry (IHC) analysis was performed to assess piezo 1 and 2’s temporal and spatial distribution in skeletal tissues at various stages of development (E14.5 day, 7 day, and 8 weeks). To further understand how piezo ion channels respond to mechanical stimulation, 8-week old male mice were subjected to 7 consecutive days of in vivo axial tibial
loading. Our IHC data reveals both piezo ion channels are expressed in early mesenchyme tissue undergoing endochondral bone formation (E14.5 day). As bone develops, expression concentrates in chondrocytes undergoing hypertrophic differentiation. This is further shown at secondary ossification sites, with increased piezo detection in differentiating chondrocytes within the proliferation zone (day 7). In 8-week-old mice, piezos are strongly expressed in chondrocytes of articular cartilage and those found at the growth plate near the chondro-osseous junction, and widely expressed throughout the bone marrow. Interestingly, piezos were also detected in osteocytes of trabecular and cortical tissue but with lower intensity. However, we did not detect significant changes in the IHC intensity between mechanically loaded bones and the non-loaded controls using the current method. These data suggest that piezo ion channels may play important roles in skeletal development and mineralization. Their roles in adult bone tissues need further investigations.

75. Ezeife, Nnaemezie; Rios, Peter; Obelholzer, Jose; Danielson, Kirstie and Lacik, Igor

**Evaluation of Biocompatibility and Function of Encapsulated Pancreatic Islets in Microcapsules**

*Undergraduate - Cell Trans Inc.*

Diabetes is one of the leading causes of both morbidity and mortality worldwide. Standard treatment for the disease includes daily insulin injections, however non-optimal regulation of blood glucose with insulin therapy is associated with secondary complications such as cardiovascular, nerve, and kidney disease. An appealing alternative for maintaining blood glucose levels is islet cell transplantation, which involves the transplantation of deceased human donor insulin-producing pancreatic islets into a patient with diabetes. Although islet cell transplantation has made significant advances in terms of safety and efficacy over the last decade, there are certain challenges which include the need for life-long immunosuppression and a limited supply of human donor islets. Encapsulation of pancreatic islets prior to transplant, in which capsules act as a semipermeable membrane that hinders the patient’s immune system attacking the transplanted cells, provides a potential solution to at least the limitation of requiring immunosuppression. This research focuses on evaluating the biocompatibility of two types of polymethylene co-guanidine (PMCG) capsules (without islets) transplanted into the intraperitoneal cavity of nude mice, as well as the functionality of PMCG encapsulated human islets both pre-transplant and post-retrieval of the capsules using in vitro and in vivo assessments. In vitro assessments include islet viability, dithizone staining for insulin content, and functional response to glucose stimulation. In vivo assessments include daily monitoring of mice blood glucose
levels, body weight and an oral glucose tolerance test (OGTT). The experiment demonstrated that one of the two PMCG capsule types evaluated, specifically version 116, was biocompatible in the mouse model, and maintained human islet function and survival. Transplanted cells secreted enough insulin to restore normal levels of glycemia for up to 60 days in the mouse transplant model. In conclusion, PMCG 116 microcapsules were evaluated as biocompatible and when encapsulated with human islet cells were deemed functional.

76. Farooqi, Usamah

Procedural Memory and L2 Acquisition

Undergraduate - Psychology

This capstone project will examine procedural memory and how it enables us to acquire the ability to learn a second language (L2) and its syntactic development. Procedural memory underlies the gradual acquisition of cognitive and motor skills, like learning how to ride a bike and playing chess. In L2, procedural memory is predicted to play a role in learning grammar skills. The purpose of this study is not only to investigate the association of procedural memory and L2 acquisition, but also to compare past literature and the methods by which procedural memory and L2 acquisition were measured. The study to be conducted includes training and assessment with an artificial L2 task and the administration of multiple measures of procedural memory, including the Tower of London and the Weather Prediction. The first research hypothesis that will be tested in this study is that there will be a significant correlation between procedural memory and L2 acquisition. The second research hypothesis that will be tested is that the Weather Prediction Task and Tower of London (TOL), when administered together, will be more accurate and consistently reliable than using one measure exclusively in linking both procedural memory and second language acquisition (L2). This is will allow us to determine if different procedural memory assessments yield the same results for predicting L2 acquisition. The findings of this study will reassess whether there is a relationship between procedural memory and L2 acquisition. Furthermore, this capstone project will extend on past literature by providing us with greater insight on how procedural memory can accurately be measured across multiple testing measures.

Key Words: Procedural Memory, Second-Language Acquisition
ACAT Inhibition in the CNS as a Therapeutic Target for APOE4-induced Alzheimer’s Disease

*Undergraduate - Anatomy and Cell Biology*

APOE4, the gene encoding apolipoprotein E4 (apoE4), is the greatest genetic risk factor for Alzheimer’s disease (AD), compared to common APOE3, and APOE2, which is protective but rare. While the mechanism underlying APOE-modulated AD risk remains unclear, APOE4 is associated with accelerated amyloid-beta (Aβ) accumulation, both as amyloid plaques and soluble oligomeric forms of Aβ (oAβ), the latter considered a proximal neurotoxin. In addition, apoE4 levels in the brains of humans and transgenic mice (Tg) expressing human APOE are lower compared to apoE3. Thus, one possible therapeutic target for APOE4 carriers is increasing apoE levels and decreasing Aβ levels. Increasing the intracellular free cholesterol pool in neurons and glial cells would allow greater lipidation of apoE4 particles, thereby increasing their stability and increasing apoE4 levels. This was tested using an Acyl-CoA: cholesterol-acyltransferase (ACAT) inhibitor (ACAT-I). ACAT esterifies free cholesterol to produce intracellular cholesteryl ester droplets and reduce the free cholesterol pool. Therefore, our therapeutic target for APOE4 carriers is increasing available cholesterol for the lipidation of apoE4 particles through the inhibition of ACAT. In this study, we treated male E4FAD-Tg mice, which specifically over-express Aβ and express human APOE4, with ACAT-I in a prevention paradigm (6-8M). ACAT-I treatment prevented memory loss and a reduction in synaptic proteins, reduced soluble and insoluble Aβ levels, Aβ deposition, and neuroinflammation, without evidence of indirect target engagement, an increase in apoE4 lipidation. Thus, ACAT-I demonstrates efficacy and produced significant changes in mechanistic pharmacodynamics that corrected measures of Aβ aggregation and neuroinflammation. Further investigation is ongoing to understand the mechanisms underlying ACAT inhibition and apoE4 lipidation as a therapeutic target for AD.

78. Flaminia, Ainna

*Visual Art-Based Interventions in Healthcare: A Review of Current Literature*  
*Undergraduate - Nursing*

**Background:** As medicine shifts from being less focused on a medical model of identifying disease in order to find a cure and into a progressive approach that aims to improve health outcomes for the whole person, strategies and practice beyond good bedside manner is necessary for achieving long-lasting health management. **Purpose:** Identify how visual arts have been utilized as an intervention in patient care and assess the patient outcomes. **Methods:** Literature was gathered from the CINAHL and Medline (PubMed) databases on 9/26/18 and
10/12/2018. Search terms included art intervention and healthcare, art intervention, art therapy, and visual art. After observing recurrent subject terms, creativity in counseling and creative ability was added to the search terms. Upon initial collection of relevant articles, 77 pertinent results were found. After screening with pertinent inclusion criteria, 16 articles were selected for further review. **Results:** Significant improvements in patient outcomes were consistent for addressing psychosocial needs, especially in treatments for mental health-related interventions related to anxiety. Most interventions were used as part of a therapeutic series of workshops and featured several forms of visual art activities. Outcomes for these workshops varied, some patients approaching or demonstrating significant change and others were non-conclusive in their respective studies. **Conclusion:** Current research shows promising uses of visual-art based interventions, especially as complementary support to current practices. Improvements in mental health outcomes warrants greater investment in the development of visual-arts based interventions and providing care for psychosocial patient needs. Further, rigorous testing is required if visual arts are to be utilized more often to ensure their efficacy and safety.

79. **Flemm, Haley**

**Effectiveness of the "Healthy Minds, Healthy Schools" program**

*Undergraduate - Psychology*

This project’s aim is to conduct a program evaluation on a subset of the students in the Gads Hill “Healthy Minds, Healthy Schools program.” Specifically, the question of the is whether or not youth electing to stay in the program a second year receive an additional benefit. The “Healthy Minds, Healthy Schools” program provides evidence-based interventions in order to enhance the students’ achievements, socio-emotional development, and overall well-being through either individual, group, and family counseling, home visits, or crisis interventions. For underrepresented minority youth, the intensity of intervention is often associated with greater prevention of truancy. The total number of youths are 100+ and the multiple year youth are approximately 30. I have access to de identified data where I will perform a secondary analysis examining the differential outcome for youth who elect to repeat the program and therefore having a more intense, second/third dose of the intervention. The multiple year group will be compared to the overall group for their pre and post data the first year to see if they differed as a group at the beginning from those in the intervention. Then, change scores for the multiple year youth will be analyzed.
80. Flores, ELSI; Bell, Aleeca F.; Vonderheid, Susan C. and Park, Chang Gi

**Optimal Urinary Incontinence Reducing Intervention**

*Undergraduate - Nursing*

Urinary incontinence (UI) is a common problem in women from around the world. Pelvic floor muscle training (PFMT) is a non-invasive intervention known to improve UI. However, Cochrane reviews conclude that the optimal type, duration, and frequency of PMFT remains unknown. The purpose of this study was to identify the optimal type, duration, and frequency of PFMT for the treatment of UI by conducting a rapid review of literature. Our rapid review resulted in 21 studies meeting review criteria using two databases: PubMed and CINAHL. Since the 21 studies demonstrated a wide variety of PFMT interventions and outcomes making it difficult to address the study review's purpose, conducted a meta-analysis of 12 studies that shared one of two outcome measures: pad test and International Consultation on Incontinence Questionnaire - Short Form (ICIQ-SF). We anticipate that the meta-analysis will enable us to identify which PFMT intervention results in the strongest statistical effect to improve UI, and thus guide further research.

81. Floresca, Abigail and Erez, Edna

**Contextualizing Radicalization and Violent Extremism in the Somali American Community: A Tale of Two Cities**

*Undergraduate - Criminology, Law, and Justice*

Minneapolis, Minnesota and Columbus, Ohio - home of the two largest Somali American communities in the United States - have starkly different histories of violence in their communities despite similar circumstances of immigration and settlement in the Midwestern United States. For example, while in Minnesota 2 – 3 dozen young men were recruited overseas to fight in the jihadist militia groups Al-Shabaab and ISIS and have since been incarcerated or killed overseas, it is speculated that only 1-2 men from Columbus have attempted to join these extremist groups. In this paper I will examine the social structures and personal perspectives of these communities through a narrative-style of criminology. Throughout the project I explored the individual, communal, ecological, and political factors that account for a Somali American youth’s persistence, desistance, or resistance from criminally deviant, specifically violent, behavior. Using the narratives of Somali-American youth, parents, community leaders and health providers, and law enforcement from Minneapolis and Columbus, I contextualize the terms “radicalization” and “extremism,” I examine unique perspective of a Somali young adult growing up with intersectional identities, I compare and contrast the Somali community’s establishment within Columbus vs. Minneapolis, and analyze the expressed prejudices impressed on the Somali
community from American society, in order to understand what factors make Minneapolis and Columbus differ from one another. Based on available research on the topic of North American Somali Communities, I conclude that attempting to identify risk for radicalization is a dangerously ambiguous practice, and in the case of Columbus and Minneapolis, has created more harm in the community. I conclude that instead, more resources must be allocated to developing and empowering this population in order to successfully ebb the stream of young men choosing violence to achieve status and belonging.

82. Gabel, Kelsey; Hoddy, Kristin K.; Burgess, Helen J. and Varady, Krista A.

Effect of 8-hour time-restricted feeding on sleep quality and duration in adults with obesity: a pilot study

Graduate / Professional - Nutrition and Kinesiology

Aim: This study examined the effects of time restricted feeding (TRF) on sleep quality and duration. Methods: Adults with obesity (n = 23) participated in an 8-h TRF intervention (ad libitum feeding 10:00 to 18:00 h, water fasting 18:00 to 10:00 h) for 12 weeks. Results: Body weight decreased (P < 0.001) by 2.6 ± 0.5%. Pittsburgh Sleep Quality Index (PSQI) total score was <5 at baseline (4.7 ± 0.5) and post-treatment (4.8 ± 0.7) indicating good sleep quality throughout the trial. Wake time (baseline: 5:50 ± 0:20; week 12: 6:00 ± 0:20 h:min), bedtime (baseline: 22:30 ± 0:20; week 12: 22:35 ± 0:20 h:min), and sleep duration (baseline: 7.4 ± 0.2 h; week 12: 6.9 ± 0.2 h) remained unchanged. Subjects were then analyzed by degree of weight loss. There was no difference in sleep quality and duration between successful and non-successful weight losers. Conclusion: These pilot findings indicate that TRF does not alter sleep quality or duration in subjects with obesity with healthy sleep habits at baseline, regardless of amount of weight loss.

83. Ganesh, Aishwarya; Sonali Gandhi; Jason Murphy; Katrece Outlaw; Toni Riveros; Errick Christian and Rosaura Fernandez

Health Literacy in an Urban Emergency Department

Undergraduate - Emergency Medicine

Many patients with low health literacy levels are seen in the emergency department and have worse outcomes. Screening modalities, such as the Short Test of Functional Health Literacy in Adults (STOFHLA) have been validated in English-speaking patients. In this study, the goal was to identify alternative
screening questions from previous studies to replace the longer version of STOFHLA.

84. Garcia, Jocelyn; Rajan, Srivatsan Goivnda; Burg, Nathan and Saxena, Ankur

Quantitative Analysis of Notch Signaling-Mediated Olfactory Neurogenesis

*Undergraduate - Biological Sciences*

The zebrafish olfactory epithelium (OE) is a complex tissue composed of two main types of olfactory sensory neurons (OSNs), microvillous (mOSNs) and ciliated (cOSNs), that are derived from two different stem cell populations, namely neural crest stem cells (NCCs) and placodal stem cells (PSCs), respectively. The highly conserved Notch signaling pathway is known to play a role in the proliferation and differentiation of cell lineages across multiple embryonic tissues. However, whether or not Notch signaling regulates the differentiation of OSNs remains unknown. Previous RNA in situ hybridization (ISH) data from our lab revealed that multiple Notch signaling receptors were expressed in the OE during olfactory neurogenesis. Furthermore, hybridization chain reaction (HCR)-based ISH showed that the Notch signaling ligand delta-A is similarly expressed in the OE. We inhibited Notch signaling using both chemical and genetic methods and found statistically significant increases in the number of both mOSNs and cOSNs. Analysis of NCC differentiation in the OE revealed a higher rate of mOSN neurogenesis upon Notch signaling inhibition, which may explain the increase in mOSNs. Immunostaining for the PSC marker protein Dlx3b revealed a decrease in PSC numbers upon inhibition of Notch signaling. Additionally, HCR-based ISH for progenitor cell marker neurod4 in Notch signaling-inhibited embryos showed a decrease in the area of expression in comparison to control embryos, suggesting reduced numbers of progenitor cells. Taken together, these results suggest that premature differentiation of progenitor cells may explain the increase in cOSNs upon Notch signaling inhibition. In the long term, understanding how Notch signaling affects two distinct neuronal subtypes can provide insights into how cells establish neuronal diversity during development.

85. Garr, Casey; Daugherty, John; Bond, Samantha and Lebowicz, Leah

Utilizing Visual Storytelling and Cultural Traditions to Promote Active Engagement in Health Education

*Graduate / Professional - Biomedical and Health Information Sciences*

This research was conducted in collaboration with Northwestern University’s Access to Health program, a project that aims to provide sustainable health intervention methods for vulnerable populations in developing areas of the world.
In Lagos, Nigeria, members of Access to Health train volunteer Community Health Educators (CHEs) in specific areas of health. These CHEs then travel to informal settlement communities to teach community members. Access to Health members are currently using a lengthy curriculum written in English to teach CHEs, a curriculum that could benefit from visual representations of the topics being taught. Relaying health and sanitation-related information to populations of mixed literacy levels, health literacy levels, and of different native languages is a challenging task for public health officials and educators. This research project explored how cultural traditions of a population can be integrated with health and sanitation-related visuals to mitigate this challenge. It focused on visual storytelling as a method of information transfer and active engagement in health education. Storytelling is effective in relaying health information to audiences in a relatable or recognizable format. This approach can be especially effective when promoting health information to groups that have historically used storytelling as a form of communication. In Nigeria, the tradition of sharing folk tales has played an important role in community life and is used to pass along cultural and historical information to subsequent generations while preserving the identity of Nigerian people. Because folk tales often present both positive and negative situations, as well as the resulting consequences arising from the situations, they offered an interesting method of information transfer. Educational materials produced visually portrayed the positive or negative effects of proper health safety – specifically related to malaria and typhoid prevention – in the form of informative and engaging stories that utilized characters and plots from traditional Nigerian folk tales.

86. Gharib, Mennat; Bark, John; Schroeder Rachel; Dowty, Shannon; Bernabé, Beatriz Peñalver and Maki, Pauline

The Effects of Race, Stress, and Income on Neonate Birthweight

Undergraduate - Psychiatry

Data has consistently shown that extremely low birth weights may lead to psychological and physiological impairment as a child gets older. Past studies have observed the relationship between psychosocial factors such as stress, anxiety, depression, race, and the socioeconomic status of the mother with neonate birthweight. This study aims to identify whether stress, race, and income influence neonate birthweight. Participants in this study included 45 new obstetric or prenatal care patients between the ages of 18-64 under 16 weeks’ gestation at UI Health Hospital and Health Sciences System. After being consented, participants were given a series of electronic questionnaires which included a demographics survey and the Perceived Stress Scale (PSS) at their first, second and third trimester visits as well as their postpartum visit. Since there was not much racial diversity, women were categorized into “white” and “other” racial
categories. Further, participants were split into high (>\$30,999) and low (<\$30,999) income groups based on total household income. The highest, or peak, PSS score out of all three trimester visits was used to measure stress levels. A linear model was run in order to determine relationships between the three variables. Unexpectedly, Neonatal birthweight was not associated with maternal race, health care source or number of biological children (p>0.05). However, Neonatal birthweight was associated with maternal stress, yet the relationship was dependent on the household income (p=0.08). Other, biological markers (e.g., cortisol levels) might be more accurate in predicting stress levels, and a larger sample size must be used in order to confirm study findings.

87. Ghodsi, Seyed Mohammadreza; Anand, Sushant; Shahbazian-Yassar, Reza; Megaridis, Constantine and Shokuhfar, Tolou;

**Graphene Liquid-Cell Transmission Electron Microscopy Investigation of Confined Liquids**

*Graduate / Professional - Bioengineering*

Studying wet biological samples poses a significant challenge for conventional transmission electron microscopy (TEM) due to stringent requirements of ultra-high vacuum design and narrow pole piece gap for sample insertion in the microscope column. Although recent developments in silicon-based microfluidics have enabled the flow of liquids between thin silicon nitride membranes for in situ TEM experiments, this technique suffers from low spatial and analytical resolutions for imaging and spectroscopy. The most recent liquid cell TEM technique, graphene liquid cell (GLC) microscopy, employs only layers of graphene to encapsulate liquid specimens. The most recent liquid cell TEM technique, GLC microscopy, employs only layers of graphene to encapsulate liquid specimens. Recent efforts with GLC-TEM have demonstrated superior imaging resolution and spectroscopic analysis of beam-sensitive specimens. Herein, we aim to investigate the microscopic characteristics of liquids entrapped in graphene nano enclosures using GLC-TEM. Using in-situ TEM and electron energy-loss spectroscopy of water encased in thin GLCs exposed to room and cryogenic temperatures, the nanoscale arrangement of the contained water molecules is examined. Simultaneous quantification of GLC thickness leads to the conclusion that H-bonding probability rises under increased water confinement. The present results demonstrate the feasibility of nanoscale chemical characterization of aqueous fluids trapped in GLC nanovessels, and offer new insights on water molecule arrangement under high-confinement conditions.
Using Oil Red O screening as a tool to identify novel components of the ApoB lipoprotein family using Drosophila genetics

*Undergraduate - Biological Sciences*

Apolipoprotein B (ApoB) is a component of an important pathway that mediates dietary fat uptake and storage in animals. Defects in components of the pathway have been tied to a variety of health risks in humans, including obesity, heart disease and diabetes. However, many gaps still exist in our understanding of how the ApoB lipoprotein pathway fully operates, placing limitations on the therapeutic options available to those suffering from conditions associated with its regulation. This report suggests using Drosophila M. genetics and Oil Red O screening as a model for discovering novel gene components of the ApoB lipoprotein pathway in the interest of identifying potential drug targets for monitoring its regulation. 140 distinct mutant fly lines with X-linked homozygous lethal mutations have been established to screen for candidate mutations in the ApoB lipoprotein pathway. Candidate mutant strains are selected for expressing a phenotype of abnormal lipid droplet accumulation in the midgut epithelium of drosophila larvae. The model consists of first screening each stock to identify the stage in development at which the mutations exhibit lethality, and then performing Oil Red O screening on eligible stocks to assess midgut epithelial lipid droplet accumulation. As of January 31, 2019, 39 out of the 140 mutant fly lines have been identified as eligible candidates to proceed to the Oil Red O screening phase of the study.

Arterial stiffness response to acute inflammation in young adult males and females

*Undergraduate - Kinesiology*

Background: Acute inflammation increases large-artery stiffness (AS) and reduces wave reflections, both markers of cardiovascular disease and independent predictors of cardiovascular risk. Recent studies show sex differences in arterial wall properties and markers of arterial stiffness. Therefore, sex may influence AS responses to acute inflammation. Purpose: To determine if sex differences exist in the AS response to acute inflammation. Methods: AS was measured in 23 young adults (12 males: 26±4 yrs, 24.2±3.1 kg/m2, 11 females: 25±45 yrs, 20.9±2.4 kg/m2) before and 24h after a typhoid vaccine to induce acute inflammation. An automated blood pressure cuff (Mobil-O-Graph) was used to acquire the following
measures: pulse wave velocity (PWV), augmentation index (AIx), systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), pulse pressure (PP), and heart rate (HR). Inflammatory markers interleukin 6 (IL-6) and C-reactive protein (CRP) were measured pre and post inflammation. Results: IL-6 and CRP (p<0.01) were elevated post-vaccination. No differences were found between sexes or effects of inflammation observed for PWV (males 5.2±0.6 to 5.2±0.4 m/s; female 4.9±0.4 to 5.1±0.3 m/s; p=0.2). Females increased HR during acute inflammation, whereas males did not (males: 53±11 to 53±9 bpm; females: 56±9 to 63±8; interaction, p<0.01). PP was larger in males (pre: males 49±7.4 mmHg vs. female 42±6.8, post: 48±7.9 vs. 43±5.1; p<0.05), but no sex differences or inflammation effects were observed for AIx, SBP, DBP or MAP. Conclusion: AS, measured via PWV did not change with acute inflammation and no sex differences were observed. However, females had an increase in HR during acute inflammation, while males did not change, and females had overall lower PP. While young healthy adults do not appear to exert a sex effect, it is possible sex plays a role in AS with aging and/or among individuals with chronic disease, which needs further examination.

90. **Glinska, Magdalena and Sinfluer, Naivie**  
**Analysis of Student Perceptions of Service Learning and Global Health Impact**  
*Undergraduate - Nursing*  
The ever-changing demographic of the United States calls for healthcare professionals to be culturally competent to provide quality care to diverse patient populations. International service learning trips serve as an avenue for nursing students to integrate classroom learning with real-world experience in a different cultural setting. This qualitative study analyzes the responses of graduate nursing students to a week-long service learning trip in one of Haiti’s rural areas. The students reported overall satisfaction with the experience that they gained during the trip. Most revealed that the trip was a humbling experience that will impact their career. Lastly, they believed that the project will have a long-term impact on the community.

91. **Godinez, Isabel**  
**Study Abroad With a Graphic Novel**  
*Undergraduate - History*
The common demographic of those studying abroad are white, middle class and female. In efforts to diversify this experience, a graphic novel aimed at middle and high school students could promote more students from under-funded backgrounds to study abroad. By interviewing 5 first generation students, these case studies reflect what common concerns and experiences this demographic had with the study abroad process. Each interview was transcribed. Many accredited the experience to their deeper understanding of themselves and their global citizenship. Some believed if they received this information at an earlier period in their lives, the experience of applying and actually studying abroad could have gone smoother. By promoting this experience in a graphic novel to under-resourced communities, this can spur more students to take this opportunity. A guide for educators is included in how to facilitate this discussion along with guiding questions to promote higher order level thinking. Future studies could benefit from this research by studying the correlation between students reading the graphic novel and the rates of first-generation students studying abroad.

92. Grahn, Ashley and Friedenson, Bernard

**Aggressive brain cancer has links to gene abnormalities in development and immunity**

*Undergraduate - Biochemistry and Molecular Genetics*

Glioblastomas (GBM) are aggressive malignant brain tumors with no effective treatment. Typical survival is only one to two years after diagnosis. We conducted an analysis of GBM data to strengthen the understanding of what causes the disease, with the goal of enabling prevention and better treatment. We compared genes mutated in GBM to genes associated with neurodevelopmental disorders such as mental retardation, autism, and schizophrenia. To make these comparisons, we studied primarily single-base substitutions and large-scale chromosomal deletions in both pediatric and adult GBM patients. Databases such as The Cancer Genome Atlas (TCGA) were queried to provide genes mutated in GBM. These GBM mutated genes were then compared to genes that have robust evidence that they are driver genes for neurodevelopmental errors. These comparisons found subsets of GBM shared mutations in genes also involved in neurodevelopmental disorders: HDAC4, KRAS, KDM6A, KDM6B, CHD7, BCAR3, CDKL5, PAK3, FGFR1, TCF12, AKT1, MAP3K3, ATRX, NOTCH3, NOTCH4, PTEN, and TP53. Although the genes were found in only a limited subset of GBM cases, network analyses found multiple connections to major pathways associated with GBM. The damaged genes relate GBM to fundamental processes in the development of the nervous system in newborns and to the prevention of infection. Moreover, the genes all have epigenetic functions as regulators, effectors, or mediators. These findings show that some subsets of GBM may originate from
genetic errors in development and in immunity. KDM6A, CDKL5, PAK3, and ATRX are all located on the X chromosome, and may contribute to sex differences in the survival rates of GBM patients.

93. Griza, Ruxandra; Chou, Luoth and Kenig, Fabien

**Elucidating Lake Vida biosignatures for astrobiological investigations**

*Undergraduate - Earth and Environmental Sciences*

Lake Vida, located in the McMurdo Dry Valleys of East Antarctica, is one of the largest entirely frozen lakes in the world, and is a useful astrobiological analog for icy worlds, such as Mars or Europa. Underneath the layers of ice and sediment lies an interstitial brine that harbors a cold-limited, aphotic, and anoxic ecosystem in which microorganisms are metabolically active. Above the brine layer, sediments trapped within the lake ice are frozen, so any metabolites present in the sediments are no longer being degraded. The metabolites in the sediments can thus be used as biomarkers of life forms that lived in Lake Vida during four of the lake’s past depositional periods. We extracted metabolite lipids from sediments collected from Lake Vida ice cored in 2010. The lipids were identified using gas chromatography-mass spectrometry (GC-MS), and were then matched to the organisms that likely produced them. This was done for extracts from all four sediment layers in order to elucidate any trends in the Lake Vida microorganism populations over time. The steroids and hopanes identified in the lipid extracts indicate the presence of eukaryotes and bacteria in past environments, but no archaea biomarkers were detected. Further analyses will help us understand how microorganisms survive in and adapt to extreme conditions, as well as how life forms might survive on other icy planets in the Solar System, for which Antarctica is a proxy.

94. Gross, Eddie

**One Step Closer, Two Steps Back: A Case Study of Bremen High School District 228 and Modern Day Segregation**

*Undergraduate - Political Science*

Segregation has plagued the American public school system since its inception. When one thinks of school segregation, they often think of the forced segregation that occurred under Jim Crow for decades in the South and was subsequently defeated by the likes of the Little Rock 9 and Brown v. Board of Education. While segregation drastically declined following various court rulings during the Civil Rights Movement and the implementation of legislation such as the Civil Rights Act
of 1964, it made a return during the 1970s due to white flight, suburbanization, and class bifurcation. In short, the vast amount of wealth within American cities was held by its white middle-class population, and its exodus to the suburbs largely left American cities depleted of resources. This disproportionately impacted African-Americans, many whom had spent the little money they had journeying to the North and being coerced into predatory housing contracts upon their arrival. As a result, a significant amount of work has been done on the segregation between districts. This is because segregation is thought to mostly exist between jurisdictions, with the white districts resisting segregation through economic exclusion, the absence of public housing, and the Supreme Court ruling of Milliken v. Bradley, which made it illegal to bus students between districts. However, my research has focused on how districts handle integration once their districts become less homogeneous and how segregation can continue to occur even when districts are integrated. I have done this by performing a case study of Bremen High School District 228, located in the south suburbs of Chicago. Through looking at government grants, viewing demographics, collecting data on various local forums, and speaking with students and teachers, I address how and why segregation continues to inflict students in integrated districts.

95. Gupta, Sonya; Rasheed, Nabeel; Varentsova, Anna and Wang, Lei

Neurobehavioral Biomarkers in Adolescents as A Potential Gateway for Offsetting Early Coronary Heart Disease Risk

Undergraduate - Undeclared

Neurological research has yet to fully link socioeconomic status (SES) disparities to Coronary Heart Disease (CHD) risk. Numerous studies have related adult CHD risk with SES, but little is still known about adolescent CHD risk and its cerebral origins resulting from SES disparities. We collected structural magnetic resonance imaging (sMRI) data from 41 adolescents between the ages of 13 and 14. We utilized the MacArthur Sociodemographic Questionnaire (MASQ) to capture the patient’s SES in a multidimensional way. Using sMRI software tools on computerized brain models, we manually assessed 6,232 subcortical regions for 3.5+ million slices and associated their found cerebral cortical thickness (CTh) and gray matter volume (GMV) biomarker values with adolescents’ respective SES scores. Then we looked at the association between SES and cerebral regions. Next, we looked at how behavioral proclivities like low self-control, high threat vigilance, and unhealthy lifestyle (e.g. smoking, overeating, sleep loss) are associated with these cerebral regions. We used these associations to predict CHD risk in adolescents. We found SES to be significantly positively correlated with cerebral CTh in the lingual gyrus, precentral gyrus, lateral orbitofrontal, postcentral gyrus, superior parietal lobule, precuneus, entorhinal cortex, and...
middle temporal gyrus. In addition, we found SES to be significantly positively correlated with cerebral GMV in the medial orbitofrontal, supramarginal gyrus, and temporal pole. These areas are correlated with higher reasoning, decision making, and other CHD proclivities. The results indicate that adolescent SES is significantly positively correlated with several neurobehavioral biomarkers of CHD risk. These findings trace adolescent SES to CHD risk, thus introducing neurobehavioral biomarkers as a gateway into offsetting early CHD risk in adolescents. Further work will expand the subject pool, utilize other morphometrical measures, assess subcortical regions, and continue tracking the current subjects to see how their brain morphometries and CHD risk change over time.

96. Guzman, Alejandra; Bing-Canar, Hanaan and Berenz, Erin C.

Comparing Drinking Motives among Young Adults Meeting Criteria for Posttraumatic Stress Disorder with and without Major Depressive Disorder

Undergraduate - Applied Psychology

Posttraumatic stress disorder (PTSD) increases risk for alcohol use problems, in part due to the use of alcohol to cope with negative emotions. However, comorbid major depressive disorder (MDD) may impact why individuals with PTSD drink. For example, individuals with comorbid MDD may use alcohol more frequently to cope, due to heightened symptom severity, as well as be more likely to drink to increase positive affect (e.g., enhancement motives), due to difficulties with anhedonia. The purpose of this study was to compare individuals with current PTSD+MDD, PTSD only, and controls (no PTSD or MDD) on self-reported drinking motives. It was hypothesized that 1) individuals with PTSD+MDD, compared to PTSD only and controls, are would be more likely to drink due to enhancement and coping motives. No differences were expected for other motives (i.e., social and conformity). Participants were 130 young adults (63.1% women) ages 18-25 who endorsed interpersonal trauma exposure (e.g., sexual or physical assault) and weekly alcohol use. Results of One-Way ANOVAs indicated significant group differences in coping motives, F =4.64, p = 0.013, but no other drinking motives (p’s > .05). Individuals with PTSD+MDD (M =16.19) endorsed greater coping motives than individuals with PTSD only (M = 13.14) and controls (M = 12.63). The usage of coping drinking motives to manage a comorbid PTSD and depression diagnosis provides context for future research into more effective treatment and management of the diagnoses and drinking.
97. **Haded, Francisco**

*The Artistic and Sociopolitical Implications of Vaporwave--The First Internet-Born Art and Music Genre*

*Undergraduate - Political Science*

Vaporwave is an Internet-based art and music genre that came into existence in the early 2010s and quickly gained popularity on social media sites, YouTube, and online discussion forums such as Reddit and 4chan. With its name being a take on the term “vaporware”, a moniker for computer hardware and software that has been advertised but is not yet available for sale, it should come as no surprise that the genre’s themes are equally vague and difficult to define. Specifically speaking, vaporwave art is characterized by early Internet symbolism and late 1990s web design, popular brand logos and imagery, 1980s and 90s pop culture nostalgia including video games, anime, and advertisements, Japanese iconography, lines of text in digitalized font, either in English or Japanese, expressing thoughts of sadness, existentialism, or surrealism, and so forth. The music of the genre is characterized by slow, deep vocals, and heavy use of distorted samples from popular R&B, New Wave, and easy listening tracks from the 1970s-90s as well as videogame soundbites. The lyrics of vaporwave songs possess similar themes to that in the text posts of the art—being based on nostalgia, sadness, existentialism, surrealism, as well as dissatisfaction with consumerism. On that note, the intent of my research is to uncover the implications of vaporwave both as an artistic and as a sociopolitical phenomenon by utilizing both primary (creators and consumers of the genre) and secondary sources (including literature on the topics of protest art, surreal art, late capitalism, and online politicization). The goal of the project is to uncover how the genre fits into millennial internet culture and the trends of contemporary dissatisfaction with late capitalism and consumerism, the loss of unifying identity and cultural dysphoria in the West, and the broader, historical trajectories of surreal, postmodern, and protest-oriented art.

98. **Haider, Masooma**

*Seeing Through Trump's Surprise Victory: An Analysis of the Effects of Economic Strife on Political Behavior*

*Undergraduate - Political Science*

What is the effect not of ideology but of general economic strife, such as unemployment, perceived economic threat from out-groups, and rising class inequality on political behavior? In consideration of this question I have looked at not only the influential groups in the 2016 US elections, but likewise the Brexit
referendum in the UK, the Yellow Jackets of France, and even historical examples such as Nazi Germany before and during World War 2. Through my research, I argue that economic strife such as unemployment leads to day-to-day troubles for people, including lack of access to healthcare, housing, food and other essentials, and thereby significantly influences peoples' political behavior, including how they vote, oftentimes even more so than ideology. Demagogues, political parties and leaders can recognize and capitalize on this, leading to political upsets both historically and in the present. The formulation of polls and referendums to predict future political behavior can be restructured to better gauge these rising influences if this is indeed true. To establish this thesis, I conducted a survey to properly pursue this question, and analyzed the data to test this theory and form conclusions based on its results regarding the influence of economic strife on political behavior.

99. Haider, Shahzaib; Fancher, Ibra Seaphus; Master, Elizabeth Le; Levitan, Irena and Chen, Jiwang

Role of high-fat-diet in the Development of Pulmonary Hypertension

Undergraduate - Cardiovascular Research Core

Pulmonary hypertension (PH) is a chronic disease prevalent in patients with cardiovascular diseases. Evidence from previous literature suggests a paradoxical protection against certain cardiovascular diseases may result from obesity with an unknown mechanism with PH. To elucidate the association, two different approaches were taken: an APOE-knockout-mice genetic model and a high-fat-diet in wild-type mice under normoxia and hypoxia conditions. APOE mice are used to study obesity for their atherosclerosis-inducing result. The 6-8 week old male APOE and their wild-type siblings were exposed to normoxia or 10% O2 for four weeks. For the high-fat-diet model, 8 week old male mice ate either a high-fat or normal diet for six months under normoxia conditions. Following the different diets, the mice were exposed to hypoxia mentioned as the above. Right ventricular systolic pressure (RVSP) and pulmonary vascular remodeling (PVR) were determined using a Millar pressure transducer catheter and Aperio image software respectively. Right ventricular hypertrophy (RVH) was measured by Fulton index. The genetic and high-fat-diet models showed a significantly lower RVSP (p=0.0020 and 0.0046), RVH (p=0.0651 and 0.0292) and PVR (p<0.0001 for both) in both APOE knockout and high-fat diet treated mice. These results indicate that both models are protective against hypoxia mediated PH and PVR which supports the aforementioned obesity paradox. Further research should be conducted to understand the intricacies of the defensive mechanism.
100. **Hamilton, Nathan**

**Opinions Formed by Divine Thought: An Examination of Religious Affiliation and Situational Attitudes**

*Undergraduate - Psychology*

Social Identity Theory describes the framework of one’s identity based on their group membership and distinguishing themselves from others who are dissimilar from them, deemed the out-group. The value of group membership is important to bolstering one’s self-esteem and self-image, as the individual forms an association of the group’s status and importance with their own. Being a major group that most people associate with, religion is a clear example of an in-group for most. Religion acts as a connection to a larger community of like-minded individuals. Another ideological group that many people subscribe to is that of political affiliation. In American culture and politics, religion and political ideology are often interwoven and conflate in a number of social stereotypes. This study seeks to see how the identity association formed by being apart of a religious group, in particular Christianity, impacts opinions on behavior and actions of individuals who belong to both the in-group and the out-group. I anticipate that people who identify strongly as Christian will have more polarised opinions towards members of the in-group rather than the out-group. This hypothesis falls inline with the established Black Sheep Effect, which notes that individuals judge in-group members who violate group ideas more harshly than their out-group counterparts. Additionally, I believe that those who identify strongly with religion and have stronger opinions towards how appropriate a behavior may be will identify overall as more conservative.

101. **Hansen, Allison; Loukenas, Efstathia; York, Jason and LaDu, Mary Jo**

**The effect of APOE and sex on AD pathology during aging in EFAD mice**

*Undergraduate - Anatomy and Cell Biology*

APOE4 the greatest genetic risk factor for AD, with females>male APOE4 carriers. APOE4 is associated with the accelerated accumulation of amyloid-β (Aβ) peptide, which aggregates to form both amyloid plaques and soluble oligomeric Aβ (oAβ), the latter considered a proximal neurotoxin. Using EFAD transgenic mice (expressing human apoE and overexpressing human Aβ42), we previously demonstrated that male 6-month (M) E4FAD mice show an increase in Aβ deposition, increased neuroinflammation, increased oAβ levels and lower levels of apoE lipidation compared to male E3FAD mice. However, the effect of age and sex in EFAD mice, two important AD risk factors that modulate pathology, has not been fully studied. Thus, male and female EFAD mice aged 6M, 10M, and 18M were compared for measures of AD pathology that included cognitive impairment, Aβ pathology, neuroinflammation and synaptic viability. By MWM, learning declined
in E3FAD and E4FAD with age. Short term memory declined in male E3FAD and female E4FAD mice at 18M. Amyloid deposition, neuroinflammation, and microgliosis increase with age for E3FAD and E4FAD mice with females > males. Neuronal viability was reduced with increasing age and with greater loss in E4FAD compared to E3FAD mice. Levels of soluble Aβ42 and insoluble/plaque associated Aβ42 increase from 6M to 10M with females > males and E4FAD > E3FAD. These results support human data that both APOE4 and female sex are risk factors for AD. The EFAD mice are a representative model of human AD risk and development of pathology which can be utilized for potential AD therapeutics that target, for example, APOE4 lipidation, neuroinflammation or oAβ. Additionally, the EFAD mice demonstrate the importance of stratification based on sex within APOE genotype for future studies and therapeutic testing.

102. Harris, Erykah; Dowty, Shannon; Pezley, Lacey; Penvaler Bernabe, Beatriz and Maki, Pauline.

Convergent Validity of PHQ9 and CAT-MH and the Relationship Between Screening Outcomes and Treatment for Depression in Perinatal Women

Undergraduate - Psychiatry

Depression occurs at a disproportionate rate in women, with higher rates occurring during child-bearing years. It is reported that a majority of pregnant women go undiagnosed for depression, with only 5% receiving treatment. The current screening tool used in the perinatal population, PHQ-9, has been validated but with limitations. This project aims to compare two screening tools for depression and treatment in a clinical setting.

A mixed-method analysis was conducted. The sample included 312 women. Women presenting for their first obstetric visit at the UIHHSS Center for Women’s Health were enrolled in a longitudinal study to examine their mood over the course of their pregnancy. Women were administered two validated screening measures for depression: the PHQ-9 and the Computerized Adaptive Diagnostic test for MDD (CAD-MDD). PHQ-9 scores ≥ 10 indicate moderate-to-severe MDD. A chi-square analysis was run for association. Medical record data for women who had positive CAD-MDD and negative PHQ-9 scores was assessed for treatment indicators (social work consult or referral or psychiatry consult or referral). When data for all visits are combined, there are significant differences between PHQ-9 and CAD-MDD (power=0.89, N=588, p-value<0.05). In the future, when we have a larger sample size of participants that have completed all their visits (N>500), we will be able to estimate whether the gap between CAD-MDD and PHQ-9 is maintained during pregnancy or changed as pregnancy progresses. 33 women were analyzed for treatment indicators for depression. 39% of these women were not offered treatment. In conclusion, there is a significant difference between PHQ-9 and
CAD-MDD when data is analyzed at all visits but the data was inconclusive as pregnancy progressed. There was a significant percentage of women with no treatment offers, which indicates that there is work to be done by healthcare providers in regard to perinatal depression and treatment.

103. Hasnain, Isra; Zimnicka, Adriana and Frasor, Jonna

Role of the PHLDA1 protein in MCF-7 Cell Growth

*Undergraduate - Physiology and Biophysics*

Pleckstrin homology-like domain, family A, member 1, more commonly known as PHLDA1, is a protein-encoding gene which has received increasing attention over the last decade due to its complex functional role in cancer. Evidence shows that PHLDA1 may function as a transcriptional activator which acts as a mediator of phenotypes such as proliferation and apoptosis, depending on the cellular type and context. Previous studies in the Frasor lab have determined that PHLDA1 knockout cells undergo a greater increase in number than wild-type cells, suggesting that the WT protein might be a potential tumor suppressor. However, it is unknown whether this increase in cell number occurs due to increased cell proliferation, decreased apoptosis, or both. This project aims to elucidate the mechanism behind the increase in cell number for the PHLDA1 KO gene in MCF-7 estrogen receptor-positive breast cancer cells. Three main experiments were constructed to answer this question: a BrdU assay, RT-PCR for known apoptosis genes, and immunohistochemistry (IHC) with antibodies against important proliferation and apoptosis marker proteins. The BrdU assay demonstrated there is more incorporation of BrdU in KO clones, indicating greater rates of proliferation. The RT-PCR analysis demonstrated an increased fold change in the anti-apoptotic gene BCL2 as well as low expression of apoptosis-inducing factor AIFM1, suggesting an overall anti-apoptotic mechanism. To support these findings, the immunohistochemistry analysis further elucidated the behavior of two markers in PHLDA1 KO cells. Ki67 exhibited higher nuclear expression in KO cells as compared to WT. Additionally, there was a weaker signal of cytosolic cleaved PARP in the KO cells as compared to WT. This aligns with expected results of increased proliferation and low apoptosis in the PHLDA1 KO tumors. Overall, these data suggest that PHLDA1 KO cells exhibit both increased proliferation and decreased apoptosis, expanding the role of the PHLDA1 gene.

104. Heath-Borrero, Kimberly; Hardy, Laura R.; Lantvit, Daniel and Burdette, Joanna
Syngeneic Modeling of Fallopian Tube Derived Ovarian Cancer

Undergraduate - Biological Sciences

Ovarian cancer is the most lethal gynecological disease, and the fifth leading cause of cancer-related death among women. Although there are ongoing clinical trials for immune therapy to treat ovarian cancer, progress has been limited. Most in vivo studies for ovarian cancer use athymic nude mice xenografted with human cancer cells in a background lacking adaptive immunity. The main syngeneic model used in the ovarian cancer field is called ID8, which is derived from the ovarian surface epithelium. However, ovarian cancer can also arise from the fallopian tube epithelium. In this study, ovarian cancer cells derived from the fallopian tube epithelium were injected intraperitoneally into immunocompetent FVB/N mice to evaluate the role of the immune system with cells that had alterations including PTENshRNA, PTENshRNA/p53R273H, PTENshRNA/KRASg12V, and PTENshRNA/KRASg12V/p53R273H. To determine if the adaptive immune response would affect the gross tumor morphology, H&E staining was performed on the tumors. The survival times between the syngeneic and xenograft system were compared to determine the role of the immune system on progression of disease from the murine oviductal epithelial derived tumor models. CD3 and CD8 specific antibodies were used to examine the presence of T lymphocytes, and F4/80 antibody was used to examine the presence of activated macrophages. The overall tumor morphology was unaffected by the adaptive immune response. In addition, the presence of adaptive immunity increased the aggressiveness of the models when compared to tumors grown in athymic mice. Finally, our model shows that increased mutational status increases tumor immune infiltration. These models can be used as a tool for the scientific community to more effectively model the immune response to ovarian cancer or immune therapies.

105. Hernandez, Ana and Luque, Alicia

Investigating the Role of First Language Flexibility in Adult Second Language Learning: An ERP Study.

Undergraduate - Spanish/Psychology

In today's world, many adults find themselves in a situation in which it is beneficial or even necessary to learn a second language (L2). Yet, learning an L2 during adulthood is a complex and challenging endeavor that results in a great deal of variability in learning outcomes. Researchers who examine L2 learning are interested in identifying the characteristics shared among proficient bilinguals in order to shed light on the mechanisms that may contribute to successful L2 learning. One relevant characteristic of proficient bilingualism, as posited by a
recent hypothesis (Bice & Kroll, 2015) may be that learners with more "flexible" first language (L1) systems may be better at acquiring an L2. In this study, we assessed first language (L1) flexibility among intermediate learners of Spanish (N=10) using event-related potentials (ERPs). Participants completed an ERP picture-sentence matching task following Sanoudaki & Thierry (2015) and Luque et al., (2018), two studies that provided neurocognitive evidence of L1 flexibility among highly proficient bilinguals. Data analyses are ongoing, however preliminary visual inspection of the ERP waveforms reveal evidence of L1 flexibility among some but not all L2 learners, suggesting that that the role that these factors play seems to differ along the continuum of bilingualism, with other factors, such as linguistic and cognitive, modulating this phenomenon. The implications of these preliminary results will be considered in the context of both theoretical and applied questions related to successful L2 learning. Future directions will also be discussed, including research that will expand on these findings by examining the ways in which the young adult brain is able to accommodate and regulate the presence of a new language and the functional role that one's cognitive and linguistic flexibility may play for adult L2 development.

106. Hernandez, Samantha; Routsolias, Joanne, and Chhabra, Neeraj

**Adjunctive Lidocaine Patches in Non-Radicular Low-Back Pain Patients**

*Undergraduate - Biological Sciences*

Lidocaine patches are frequently prescribed in the Emergency Department (ED) as adjunctive therapy to treat low-back pain. Although, there is little evidence supporting the effectiveness of lidocaine patches in controlling low-back pain. The goal of this study was to determine the efficacy of lidocaine patches in treating low-back pain in patients who presented with low-back pain to the Emergency Department in an urban, public hospital. No significant difference was shown between individuals who received the lidocaine patches and those who received the placebo patches. From this, it was concluded that lidocaine patches do not provide significant low-back pain relief.

107. Hernandez-Pacheco, Miguel

**The Impact of Open Educational Resources on First Generation Students**

*Undergraduate - Communication*

Due to recruitment efforts from colleges and universities, the population of first-generation students in higher education has steadily increased. However, studies have illustrated that first-generation students are more likely to struggle academically than their peers. In response, colleges and universities have made it
their mission to reduce this achievement gap. Since first-generation students tend to come from a lower socioeconomic background, they often struggle to purchase the required texts for their courses due to increasing costs. By not having the required material, students are less prepared for class, which can negatively impact their academic performance and lower their academic self-efficacy. This study addresses the relationship between the academic self-efficacy of first-generation students when they are provided with Open Educational Resources (OER), a course material that is provided to students free of charge. Implementing OER can alleviate the financial stress of purchasing required texts, something that students from a lower socioeconomic background worry about more. By providing students with required texts from the start, this study expects first generation students to prefer OER over traditionally published texts as well as have a higher academic self-efficacy. Results from this study can be used by colleges and universities to consider the implementation of OER as a tool to increase the success rates of their first generation students.

108. Herr, Victoria; Mitera, Dominika and Coba-Rodriguez, Sarai

“I can’t wait to go too!”: The Messages low-income, Latino Preschoolers Transitioning to Kindergarten Receive and their Joys and Fears

Undergraduate - Urban Education

The transition to kindergarten is one of the most critical milestones for children. Research has suggested that low-income, Latino children are at heightened risk for academic failure compared to their Black and White peers. However, little research exists on the messages that mothers tell their preschooler about kindergarten and how preschoolers respond to such messages. Contributing to this gap in the literature, we utilized qualitative interviews with 17 low-income Latina mothers and their Head Start children to explore how they facilitated their children’s’ transition through the messages they gave. Preliminary findings suggest mothers’ messages reflected their understanding of school expectations, such as having new academic responsibilities, learning how to properly behave in kindergarten and the importance of maintaining personal boundaries. Mothers also focused on the change in setting, the new people that children would encounter in kindergarten, and helping children manage the fear of going to kindergarten. Mothers’ conversations also allowed them to gauge children’s feelings towards kindergarten. Through this qualitative study, we also learned that preschoolers’ feelings towards kindergarten entailed positive and negative feelings. Feelings of excitement were widely described, as well as feelings of curiosity. Preschoolers displayed their excitement through a variety of avenues: wanting to take the bus, having a backpack, attending a new school (which included going to school with their siblings/participating in school activities), and wanting to learn and do homework. A
few preschoolers expressed negative feelings: sadness, disinterest, and resistance. Our findings add to the limited research by detailing what mothers are telling their children about kindergarten and emphasizes preschoolers' feelings towards kindergarten. This study adds to the limited literature on why children are excited for school from the perspective of mothers, who are the unit of analysis and source of knowledge. It further shows that Latino parents strongly value education.

109. Hitzman, Ryan; Dunlap, Tareisha; Chen, Shao-Nong; Pauli, Guido; Dietz, Birgit and Bolton, Judy

Humulus lupulus and 6-PN Activate AhR to Promote Breast Cancer Chemoprevention through Epigenetic Regulation of CYP1A1

*Graduate / Professional - Medicinal Chemistry and Pharmacognosy*

Many postmenopausal women frequently use Botanical Dietary Supplements (BDS), such as hops. Compounds found in hops showed chemopreventive activities with often unknown mechanisms, and importance. This study expands on the in vitro effects of hops and its bioactives. Estrogen carcinogenesis is in part mediated by the oxidative estrogen (E2) P450 1B1 mediated metabolite, E2-3,4-quinone (genotoxic pathway). P450 1A1 (CYP1A1) converts E2 to a benign 2-hydroxylated product (estrogen detoxification pathway), yet E2 enhances the genotoxic pathway through epigenetic repression of CYP1A1. Transcription of CYP1A1/1B1 are dependent upon the aryl hydrocarbon receptor (AhR). In-Cell Western, used to quantify relative protein expression of ERγ, showed AhR dependent degradation of ERγ when MCF-7 cells were treated with 6-PN. MCF-7 breast cancer cells transiently transfected with XRE-luciferase exhibited AhR dependent luciferase activity for treatments with hops and 6-PN. qRT-PCR was used to quantify changes in CYP1A1 and CYP1B1 transcription. Hops and 6-PN significantly upregulated CYP1A1 (estrogen detoxification pathway) in the presence of E2. The mechanism of action for the increase in CYP1A1 expression was analyzed. A chromatin immunoprecipitation (ChIP) assay for DNA methyltransferase 1 (DNMT1) in the presence of E2 alone increases DNMT1 accumulation at the CYP1A1 promoter, eluding to increased methylation and CYP1A1 downregulation. When the same ChIP assay was performed with E2 and hops or 6-PN there was significant reversal of DNMT1 association with the CYP1A1 promoter, correlating with the preferential increase in CYP1A1 transcription observed with hops and 6-PN. The current studies describe a new chemoprevention pathway for hops. This highlights the importance of elucidating bioactivities for individual phytochemicals and extract standardization to these compounds for women’s health BDS. Supported by NCCIH/NIH grants: 1F31AT010990-01; P50 AT000155.
110. Hoppe, Katherine

From Oppression to Activism: The History of Department of Disability and Human Development Building

*Undergraduate - Rehabilitation Sciences*

Before it was UIC’s Department of Disability and Human Development (DHD), the building that stands at 1640 West Roosevelt Street was originally built as an institution for children ages 6 and under with disabilities. The institute was intended to serve the many individual's on the waiting list for Lincoln and Dixon State Schools, but ultimately the institute never reach its fullest potential. The many factors that contributed to the downfall of the institute, including prejudice toward individuals with disabilities and lack of staffing, will be analyzed in depth. Research of the building and its history was performed through the use of the Chicago Tribune database, academic journals, and college archives of the university’s history. This building has evolved from a failing, ableist institution to house its current namesake department that stands against all that it was intended to be.

111. Horras, Megan; Aydemir, Burcu; Chun-Hao, Huang and Foucher, Kharma

The Relationship Between Fatigability in Women with Hip Osteoarthritis and Physical Activity.

*Undergraduate - Kinesiology and Nutrition*

Introduction: There is a relationship between hip osteoarthritis and low levels of physical activity. Osteoarthritis is associated with fatigue. There is little known about the way in which physical activity and fatigability are related in women with hip osteoarthritis. In this study we tested to determine if women with hip osteoarthritis have decreased physical activity levels because of their increased fatigability. Methods: 19 women (age 62 ± 10.6, and BMI 30.58 ± 6.6) diagnosed with hip osteoarthritis were included. Average pain and function scores were 31.5 ± 16.5 and 36.1 ± 18.3 respectively out of 100. Self-reported fatigue was assessed using a survey. Perceived and performance fatigability were determined during a 10-minute treadmill test. Perceived fatigability was related to self-reported ratings of fatigue before and after the test. Performance fatigability was determined by changes in speed during the test. UCLA scores reflected self-reported activity levels. %sedentary, %light activity, and %moderate-vigorous activity, along with steps/day were measured using an Actigraph activity monitor. Results: There was a significant correlation between percent sedentary time and performed fatigue score (R= -0.555, p= 0.049). There were no associations between performed fatigue and % light activity, and % moderate to vigorous activity and the UCLA scores. There were no associations between self-reported fatigue and perceived fatigue for any of the four physical activity variables. Conclusions: Our hypothesis was partially
supported as an association between percent sedentary time and performance fatigability was seen. Women with hip osteoarthritis may benefit from interventions that would increase their physical activity levels in ways that would not cause them to fatigue as quickly or to boost confidence in their abilities to perform activity.

References:


112. Hovinen, Heather; Isaia, Ashley R.; Peters, Amy T.; Weinstein, Sally M. and West, Amy E.

Cross-Informant Agreement in Adolescent Depression: Correlations Among Adolescent and Parent-Reported Symptoms of Depression

Undergraduate - Psychology

Previous studies exploring correlations between adolescent and parent reports of children’s depressive symptoms have demonstrated only moderate correlations between raters. It’s been hypothesized that agreement may be higher on externalizing symptoms compared to internalizing symptoms, as parents may be less aware of children’s internal struggles. The present study aims to test this hypothesis in a diverse sample of adolescents with a broad spectrum of mood severity. We predict that agreement between raters will be greater for externalizing symptoms compared to internalizing symptoms. Adolescents (n=39) ages 14-19 (M = 16.45, SD = 1.50) and their parents participated in a study of adolescent mood at a large, urban academic medical center. Parent and adolescents completed questionnaires pertaining to child depression symptoms. Correlations between adolescent and parent ratings were significant among 5 of 9 internalizing symptoms; in contrast, correlations were significant among 9 of 10 externalizing symptoms. Significant correlations for internalizing symptoms ranged from |r| = .43-.70 and for externalizing symptoms ranged from |r| = .35-.70. Adolescent-parent agreement was strongest for suicidal ideation/behaviors and for eating and sleeping difficulties. Overall, consistent with hypotheses, results indicate stronger agreement between adolescent and parent ratings of externalizing symptoms compared to internalizing symptoms of depression. Thus, parents appear to have greater awareness of observable symptoms of depression, demonstrating closer alignment with adolescent ratings. Of concern, symptoms with more subtle clues appear to be more difficult for parents to identify, with the notable exception of suicidal ideation/behavior. Adolescents demonstrate appropriate insight into their own symptoms to adequately share this information with clinicians. Strategies to
help build parent-adolescent communication around adolescents’ thoughts and feelings may enhance parent awareness of adolescents’ emotional distress, resulting in greater agreement between raters.

113. **Hu, Heather**

**White-Collar Crime**

*Undergraduate - CLJ*

For decades, the U.S. criminal justice system has failed to efficiently regulate and penalize white-collar crime. Despite the severe damage white-collar crime causes the American economy annually, our understanding of the scope, extent, and causal factors of white-collar crime is hindered by a notable lack of research on the subject matter. Consequently, white-collar criminals are taking advantage of the lack of urgency that both society and the criminal justice system have towards investigating their crimes in order to evade arrest, conviction, or to secure themselves an inconsequential punishment. It is essential that we give white-collar crime a higher priority as a field of study and as a criminal offense, as well find stronger and more effective methods in order to ensure the capture of white-collar criminals.

114. **Hurst, Zebulon**

**Excruciating Bliss: Aesthetic Masteries of Masochism in Music Videos**

*Undergraduate - French and Francophone Studies*

This project, made possible through year-long funding from the LASURI grant and Research Advising from Dr Heidi Schlipphacke of Germanic Studies and Classics, examines the music videos of Kendrick Lamar, Frank Ocean, and Janelle Monae from 2010 through the present moment. Inspired to peruse these works as visual text from a scholarly standpoint after several events in the recent past - DAMN., Lamar’s fourth studio album, won a Grammy for Best Rap Album, then became the first non-jazz or classical album to win a Pulitzer Prize in 2018; in 2019, Janelle Monae received a Grammy nomination for Best Album for her work Dirty Computer and was nominated for Best Music Video for Pynk - I have drawn connections between the queer futurity described by Heather Love and Lee Edelman and racialized masochism of the Abject - a concept synthesized from Gilles Deleuze, Julia Kristeva, and Darieck Scott. So what does it mean to participate in Hip-Hop visual culture as a body marginalized for identities not limited to Blackness, but rather mental illness, gender identity, or sexual orientation? Aesthetic Mastery, the term I attribute to each artist to describe how they navigate filmic time as an Abject Black body, is the product of a process each of them approaches differently: Lamar
collapses time and voice so that the self is rendered a composite being adrift and liberated from linear time, Ocean subverts normative ideals about masculine desire via glimpses into intrapersonal communication, and Monae completely abandons the traditional present for a dystopian queer future where technology and AI become convenient vehicles for representing wider issues of misogyny racism. Each of these artists renders politically relevant work whose content deserves academic inquiry and attention, turning the spectacle of Black pain into a celebration of subversion and rebellious pleasure.

115. Huynh Nguyen, Hoang Minh; Dani, Bergey and Anthony, Faiola

Supporting the Mental Health of Families in the ICU: A Family-Centered Approach to Mobile Information Communication

Graduate / Professional - Computer Science

Families experience a range of problems and burdens when a loved one is in critical condition in the medical intensive care unit (MICU), including unmet information needs, inadequate communication from the critical care team, and decision making around treatment options. All of this can contribute to psychological and physical distress and affect their general well-being. Many family members experience mental trauma: distress, anxiety, and post-traumatic stress disorder. Studies show that it is important for nurses to clarify the family’s understanding and encourage them to raise concerns and ask questions.

We approached this problem from a human-centered design perspective. By doing market research, we were able to validate the need for a family-critical care team (CCT) communication channel, which we now call FAMmCare. FAMmCare is a mobile application intended to alleviate the emotional stress and support the mental health of the family members that have a loved one in the ICU. This application provides family members the ability to see up-to-date health information about their loved one in the ICU and securely communicate with the hospital staff that provides their care. Our findings informed two participatory design iterations of a fully functioning FAMmCare system, including a mobile smartphone app for families and a tablet app for the bedside nurse.

116. Ishueva, Camila and Malchow, Robert Paul

Extracellular H+ release by glia: considering calcium and lithium dependence

Undergraduate - Biological Sciences
Recent research has shown that activation of glial cells by low levels of extracellular ATP induces a pronounced release of acid (H+) from isolated glia. However, the mechanism mediating this proton release is still not completely understood. We have tested the hypothesis that the mechanism behind glial cell proton release depends on extracellular calcium entering the cell. To test this hypothesis, we examined ATP-mediated proton flux from cultured hippocampal astrocytes bathed in Ringer's solutions containing normal (2 mM) levels of calcium and in solutions in which extracellular calcium was omitted. Extracellular levels of acidity were monitored using self-referencing H+-selective microelectrodes. We found that a significant flux of protons still occurred when cells were bathed in 0 mM calcium, suggesting that the vast bulk of H+ flux was independent of extracellular calcium. We also examined the effects of lithium, a compound which has been used for more than half a century in the treatment of bipolar disorders, on proton fluxes from isolated radial glial cells of the retina. Cells were bathed in solutions containing 1.4 mM lithium, a dose expected to mimic concentrations employed to treat bipolar disorder. Lithium at this concentration did not induce a significant alteration in the size of proton fluxes measured from isolated glia. These results suggest that alterations in extracellular calcium or lithium over the concentrations tested, do not significantly alter proton fluxes from glia.

117. Jagatramka, Ritesh

Corrosion of Batteries

Graduate / Professional - Materials Engineering

Since the advent of lithium batteries. The corrosion has been one of the major problem associated with it. Therefore I have dedicated this work on finding the different aspects that could lead to corrosion in lithium batteries and how that corrosion can be prevented to increase the battery life. The corrosion at batteries can happen at different components. Each type of corrosion associated with each component is different. The solution to those problems are also different. Current work summarized the best way to avoid those corrosion to give better cycle life.

118. Jalasutram, Anvesh; Lin, Chen; Sangha, Rajbeer; Lee, Jungwha; Corado, Carlos; Chatterjee, Neil; Ingo, Carson; Carroll, Timothy and Prabhakaran, Shyam

Quality of Life After Mild Ischemic Stroke is Affected by Stroke Location

Undergraduate - Neuroscience

Background Information: Mild ischemic strokes can cause severe issues for individuals. In the case of strokes that remain untreated for an extended period of time, the absence of blood flow leads to a lack of oxygen flow to the brain and
eventually brain tissue death. Such a course of events has the potential to cause a host of serious conditions, all of which negatively impact an individual’s health-related quality of life (HRQOL). Thus, the goal of this study is to investigate the relationship between mild ischemic stroke location in the brain and the HRQOL of a patient three months after stroke onset. Hypothesis: The hypothesis developed was that a strong association between stroke location and patient HRQOL would be most visible in strokes occurring in the brainstem, as it is one of the largest centers of the brain involved in autonomous function, and would thus be most incapable of masking stroke effects through neuroplasticity. The experimenter’s reasoning was that neuroplasticity (the ability of the brain to develop new neural connections in response to, among other cases, injury) would minimize the HRQOL impact of strokes on locations of the brain not responsible for vital function (with vital function including respiration, heart rate, etc. - autonomous function in other words). Thus, it was believed that autonomous functions impacted by strokes would not be as easily addressed by plasticity and thus exhibit a more clear impact on HRQOL. Conclusion: Within the 229 patients that were studied, impaired HRQOL three months after stroke onset was observed in 84 patients. The data indicate that patients with subcortical or brainstem infarcts (strokes) were more likely to exhibit impaired HRQOL (p = 0.02). Thus, the final conclusion was that mild ischemic strokes occurring subcortically or in the brainstem predicted impaired HRQOL three months after initial stroke onset.

119. Janceviciute, Emma

Ranges of pH in Sodium Hypochlorite between different users

*Undergraduate - Biological Sciences - project for Endodontics*

Sodium hypochlorite (NaOCl) is used during root canal treatments in dentistry to debride necrotic pulp tissue and also to utilize its antimicrobial properties to kill bacteria in the root canal space. Despite its caustic nature it is generally safe and recommended for this purpose. However, improper storage conditions can lead to complication which will ultimately surpass the risk benefits from using NaOCl for irrigating root canal space. Hence, the purpose of this study is to evaluate the storage conditions and usage condition among two sets of clinicians. The study focuses on two different users: Endodontic residents at UIC College of Dentistry and practicing dentists. Random samples are collected from these two groups. The pH of sodium hypochlorite was tested with a pH meter. Data collected includes how this solution was stored, how old it was or how many times the bottle has opened. The pH is crucial; if it is too low, it will be risky for patient use. If pH is too high, the antimicrobial properties will be diminished leaving harmful bacteria with potential for infection and treatment failure eventually leading to a loss of the tooth. Data will be compared between the different users to locate better storage for
optimal pH of sodium hypochlorite. Findings from this study can be used to find optimal storage for Sodium Hypochlorite, which will lead to more effective root canal treatments.


**Low Socioeconomic Status and Formula Feeding Directly Correlate with Increased Incidence of Hypertrophic Pyloric Stenosis**

*Graduate / Professional - Surgery*

Purpose: The purpose of this analysis was to determine if a correlation exists between socioeconomic status (SES) and pyloric stenosis (PS), as well as between PS and feeding method. Methods: Data was collected retrospectively from the electronic medical record. Patients were included if they resided in a county in Illinois where our institution maintains > 10% visit share, were <1 year in age, and received a pyloromyotomy from January 2011-May 2018. Patient addresses were geocoded and merged with county and tract-level census data. A control group was matched on gender, race, tract level, median household income (MHI), and age. Feeding method for each group was collected. Univariate analysis and multivariate analyses were employed. Results: SES was explored using MHI. After controlling for gender, age, race, and institution adjusted tract size, the association between MHI and pyloromyotomy remained significant. As MHI decreased, the odds of having a PS case increased. Additionally, the PS incidence rate increased as MHI decreased. Patients who were exclusively formula fed were more likely to have PS. Conclusion: Pyloric stenosis had a direct correlation with SES as defined by MHI. As MHI decreased, the rates of PS increased. In addition, breastfeeding was protective, independent of MHI.

121. Jasinski, Jack and Malaki, Ramin

**Antibacterial Properties of CuSO₄-PAN Nanosheets Synthesized via Electrospinning Technique**

*Undergraduate – Bioengineering*

Electrospinning is becoming a more popular technique for synthesizing nanomaterials. The ability to combine this with the known antibacterial properties of Copper, allows us to create a unique water-resistant, antibacterial, and durable nanosheet material. Antibacterial properties were thoroughly tested using CFU
dilutions and zone of inhibition testing. The green portions of the material were found to be more antibacterial than the white portions. This was clearly evident in the zone of inhibition tests. Some possible future applications for this material are bandages, food packaging, and filtration.

122. Javed, Hoor and Shaye, Daniel

**Using C. elegans to examine the regulation and function of genes associated with FSGS kidney disease**

*Undergraduate - Neuroscience*

Focal segmental glomerulosclerosis (FSGS) is a kidney disease in which there is a progressive loss of podocytes, leading to kidney failure. In humans, the INF2 gene has been identified as one of the most mutated gene that leads to FSGS. Using the nematode C. elegans, the Shaye lab has shown that two worm homologs of INF2, called exc-6 and inft-2, play a role in the development of the excretory canal (ExCa). The ExCa is a single-cell tube, involved in liquid clearance and osmoregulation, which has become an amenable model to study the process of biological tube formation, or "tubulogenesis". In addition to INF2, mutations in five other human genes have been associated with FSGS. These human genes, and their C. elegans homologs, are: TRP6C (trp-1 and trp-2 in worms), CD2AP (cdap-2), ANLN (ani-1, ani-2 and ani-3 in worms), ACT4 (atn-1) and ARHGAP24 (rga-8). It is not known whether these genes function together, or how mutations in these genes affect podocyte cell biology. We hypothesize that we can use the C. elegans ExCa as a model to assess the function and regulation of these FSGS-associated genes. In my project, I will first look at mutants in the eight C. elegans homologs for FSGS-associated genes to see if any of them, like inft-2/INF2 and exc-6/INF2, are involved in ExCa tubulogenesis. I will also use CRISPR/Cas9 technology to modify the genomic sequence of inft-2 in order to mimic the gain-of-function mutations that cause disease when present in human INF2. We expect that this will cause ExCa phenotypes, and we will then use these mutants as a tool to further understand the regulation and function of inft-2/INF2, and how this gene functions with the other FSGS-associated genes analyzed here.

123. Job, Greeshma; Paltell, C. Katherine and Berenz C. Erin

**Associations between Depressive Symptoms and Posttraumatic Stress Disorder Alcohol Expectancies in Trauma-Exposed Young Adults**

*Undergraduate - Psychology*
Individuals with posttraumatic stress disorder (PTSD) are at increased risk for alcohol use disorder (AUD), likely due to their use of alcohol as a means to cope with trauma-related memories and negative affect. Major depressive disorder (MDD) frequently co-occurs with both PTSD and AUD; however, less is known about how MDD may impact PTSD-AUD associations. Examining the relationship between depressive symptoms and positive PTSD alcohol expectancies (i.e. the belief that alcohol decreases one’s PTSD symptoms) and negative PTSD alcohol expectancies (i.e., the belief that alcohol increases one’s PTSD symptoms) may clarify the nature of this association. The current study investigated the main effects of depressive symptoms (Center for Epidemiological Studies Depression Scale-Revised [CESD-R]) in relation to PTSD alcohol expectancies (PTSD-Alcohol Expectancy Questionnaire; P-AEQ), above and beyond PTSD symptom severity. Participants were 198 college students (50.9% female; Mage = 21.24 years) who endorsed a history of interpersonal trauma (i.e., physical or sexual assault) and current weekly alcohol use. Results of hierarchical linear regression models indicated that greater depressive symptom severity was associated with greater positive PTSD alcohol expectancies (B = 0.27, sr2 = 0.05, p = .002), but not negative PTSD alcohol expectancies (B = -0.03, sr2 < 0.01, p = .769). Exploratory analyses of depressive symptom clusters revealed that greater levels of dysphoria (B = 0.24, sr2 = 0.04, p = .002), anhedonia (B = 0.29, sr2 = 0.06, p < .001), and impaired thinking and concentration (B = 0.20, sr2 = 0.03, p = .010) were associated with greater positive PTSD alcohol expectancies. These findings indicate that young adult survivors of interpersonal trauma with heightened depressive symptoms believe that their alcohol use ameliorates their PTSD symptoms. Positive PTSD alcohol expectancies may be a risk marker for problematic alcohol use in this vulnerable population.

124. John, Jessaly; Bark, John; Schroeder, Rachel; Dowty, Shannon; Penalver Bernabe, Beatriz and Maki, Pauline. 

Sociodemographic Factors in Antenatal Depression and Anxiety During the Third Trimester on Infant Birth Weight 

Undergraduate - Psychology

Despite efforts in diagnosing and treatment of mental disorders, mental health remains a serious issue in the United States, particularly amongst perinatal women. Approximately 10–15% of new mothers in the United States experience clinical symptoms of depression at 6–8 weeks after childbirth, where the strongest predictor of postpartum depression is a history of mental illness. The present study aims to investigate the relationship between infant birth weight and perinatal depression and anxiety, in an urban, diverse population in Chicago. It is hypothesized that women who show higher scores for Generalized Anxiety
Disorder, as measured by GAD-7, and Major Depressive Disorder, as measured by PHQ-9, during the third trimester will bear children with lower birth weight at delivery. The results of this research will be significant in determining if women who display signs of anxiety and depression during the third trimester are at risk for having children with low neonate birth weight. This research can be used to determine if GAD-7 and PHQ-9 scores can serve as predictors of adverse infant outcomes, which will enable mothers to gain access to resources which will help ensure the wellbeing of both them and their baby.

125. Johnson, Sharon

Cross Comparison of International and Indian Medical Standards in After-Care for Survivors of Sexual Assault

Undergraduate - Anthropology

India has recently been in the view of international attention for incidences of crimes against women, especially sexual assault. One of the responses to public pressure was the publishing of “Guidelines and Protocols: Medico-legal Care for Survivors/Victims of Sexual Violence” by the Government of India’s Ministry of Health and Family Welfare (MHFW). The document provides physicians with directives on how to sensitively provide treatment and go about evidence collection in the aftermath of assault. Despite this document’s existence, it is the case that survivors are still receiving poor after-incident healthcare (Bandewar et al., 2018). This study aims to determine whether this problem stems from the contents of the guidelines by comparing the MHFW document with its international counterpart proposed by the World Health Organization and the UNODC, “Strengthening the Medico-Legal Response to Sexual Violence”. Qualitative coding was used to compare the incidence of a set of key words related to central themes of both documents. Results showed that there was no significant difference between the incidence of themes essential to the proper holistic care for survivors of sexual assault between the two sources. This demonstrates that legislative directives towards may not be the root of the inequalities in health care for survivors, so attentions should be directed to other areas of research such as the implementation and enforcement of these guidelines

126. Johnson, Taylor

Neuropsychology of HIV-Associated Dementia

Undergraduate - Psychology

Approximately 35 million people in the world today live with human immunodeficiency virus (HIV). While much is known about how HIV affects the
immune system, significantly less is known about how HIV affects and shapes the brain. Upon entering the central nervous system, the virus often damages the brain both structurally and functionally. These changes, in turn, cause a variety of neurological symptoms, which can range from minor cognitive decline to inabilities in performing daily activities. Moreover, the virus is described as the most common preventable cause of neurologic decline in those under 50. Cognitive impairment symptoms, along with various other medical tests, are used to diagnose HIV-associated dementia (HAD) and other HIV-associated neurological disorders (HAND) often using the International HIV Dementia Scale (IHDS). This extensive literature review aims to critically explore and analyze published sources and studies on HAD, eventually discussing possible directions for further research and diagnosis.

127. Jose, Isaac; Khan, Wasim and Layden, Brian

Studies on the Effects of Whole Body HKDC1 Knockout on Glucose Metabolism in Mice

*Undergraduate - Endocrinology, Diabetes and Metabolism*

Hexokinase Domain Containing 1 (HKDC1) is a recently discovered 5th hexokinase that has been hypothesized to play important roles in glucose and lipid metabolism. In a recent genome-wide association study, it was shown that HKDC1 expression in pregnant women had a significant correlation with gestational glucose levels. Further studies have implicated a role of hepatic HKDC1 in metabolism during gestation and pathophysiological conditions such as obesity. However, the mechanism by which HKDC1 modulates glucose and lipid metabolism is poorly understood. We hypothesize that a whole-body knockout of HKDC1 in mice would cause major shifts in glucose and lipid metabolism. To address this, we developed an inducible whole body HKDC1 knockout mouse model, HKDC1f/f-Cag-Cre+/-.

At eight weeks, HKDC1f/f-Cag-Cre+/- male mice were injected with tamoxifen to get the whole body HKDC1 knockout (WBHKDC1-KO) mice. Littermates Cre- mice also received tamoxifen and served as controls. These mice were subjected to metabolic testing with glucose tolerance tests at the second and twelfth week following the tamoxifen injection. In between, fast-refed experiments were performed to determine insulin and glucose levels. Our results found that WBHKDC1-KO had better glucose tolerance with a significantly high production of insulin during GTT. We also found that feeding levels of insulin were significantly higher than those of the control group, however, glucose tolerance and insulin production progressively returned to control levels by the twelfth week which may be due to adaptation. The initial data supports our hypothesis that whole body HKDC1 is essential to maintain glucose homeostasis.
128. Joy, Dawn

**Comparative Efficacy of Acupuncture and Orthopedic Manipulation Compared to Western Medicine in the Treatment of IVDD in Dogs.**

*Undergraduate - Biology*

For my Capstone Project I will be comparing the efficacy of acupuncture and orthopedic manipulation to Western medicine in the treatment of Intervertebral Disc Disease (IVDD) in dogs. I will be comparing past treatments since 2013 at a local animal hospital that specializes in both Western and holistic medicine. Comparisons will be made between dogs diagnosed with disc disease and the time taken for recovery using both treatment routes.

129. Justen, Cameron and Kim-Cohen, Julia

**How Male’s Perceived Antisocial Behavior Affects Female Ratings of Attraction**

*Undergraduate - Psychology*

This research study tested how female ratings of male facial attractiveness varied for two different types of antisocial behavior. More specifically, ratings of attraction were collected for law-breaking behavior and norm-violating behavior. Furthermore, this study compared the impact that each of these conditions had on perceived facial attractiveness by varying the degree of facial attractiveness. It was predicted that female participants will give the highest ratings for male attractiveness and willingness to enter a relationship and the lowest ratings for perceived degree of antisocial behavior when the most attractive male photograph is paired with the law-breaking antisocial behavior. A between-subjects research design was utilized with a 11-point Likert scale for data collection through a randomly-distributed survey. The findings of this study have not been determined to be conclusive. Once data collection and analysis are completed, the results will be reported.

130. Kaddoura, Moe; Browe, Brigite; Loos, Anastasiya and Park, Thomas

**Using Long Lived Adolescent African Naked Mole Rats in Studying the Effects of Chronic Cannabis use**

*Undergraduate - Biological Sciences*

The use of Cannabis among adolescent age groups is on the rise globally, but we are still unaware of how it affects youth in the long-term. Cannabinoid receptors
utilize endogenous ligands that are integral for the creation of synaptic connections that are imperative for neuronal development. We have found that the African naked mole rat (NMR) have protracted development in comparison to most rodents; therefore, NMRs are a more effective model for studying the effects of chronic cannabis use long-term in adolescent development. In this study, the Hebb-Williams Mazes were utilized to analyze spatial learning and memory after cannabis use. These mazes have three different difficulty levels that can be manipulated and analyzed. Adolescent Mice and NMRs revealed pattern differences in latency of completing the maze while under the effects of cannabis that are difficulty dependent. From these results, we have established that the NMR model system may be used as an effective template for studying cannabis use in adolescence. Using this model, researchers can better understand how cannabis use on adolescents can affect spatial and learning abilities long term as well as their ability to recover.

131. Kadkol, Shrinidhi and Diamond, Alan

Mechanism Behind the Loss of the SELENOF Tumor Suppressor in Prostate Cancer

*Undergraduate - Pathology*

Prostate cancer is the second leading cause of cancer death in American men. Characterization of aggressive forms of the disease is particularly important to determine mortality risk and prostatectomy necessity. Several studies indicate an association between prostate cancer mortality and the SELENOF protein. SELENOF is a member of a group of proteins that contain selenium in the form of the amino acid selenocysteine. When compared to benign tissue, SELENOF levels are frequently dramatically decreased in prostate cancer, indicating its role as a possible tumor suppressor. In order to determine if the SELENOF decrease in cancer had a transcriptional basis, SELENOF mRNA levels from a cancer-derived cell line and non-tumorigenic cell line were compared. SELENOF mRNA levels between these two cell lines were very similar indicating that decreased SELENOF protein levels in prostate cancer may not be due to alterations in transcription. Rather, the reduced SELENOF levels in cancer may have a translational origin. To test this hypothesis, reporter constructs that contain the key regulatory elements of SELENOF translation were generated. These reporter constructs will allow for rapid quantification of SELENOF protein synthesis when introduced into tumorigenic and non-tumorigenic cell lines. Anticipated results could show that the SELENOF protein will be synthesized in the non-tumorigenic cell line, but will not be made in the tumorigenic cell line. This may indicate that there is a significant inhibition of protein synthesis of SELENOF due to altered regulatory function in
prostate cancer that accounts for the loss of the tumor suppressor in that disease. Confirmation that similar events occur in human tissues could have predictive value as well as identify targets for new therapeutics.

132. Kalam, Faiza; Gabel Kelsey; Wiseman Eric and Varady Krista A.

**Alternate day fasting combined with a high protein/low carbohydrate diet: Effect on body weight and metabolic disease risk factors in obese adults**

*Graduate / Professional – Nutrition*

**Objectives:** This pilot study is the first to examine the impact of alternate day fasting (ADF) combined with a high protein/low carbohydrate diet on body weight and metabolic disease risk factors in obese adults. **Methods:** Obese adults (n = 10) followed an ADF diet (600 kcal fast day alternated with an ad libitum feast day; 35% protein, 22% carbohydrate, 43% fat) for 6 months. Meal replacements were consumed on the fast and feast days, in addition to regular foods, to help attain macronutrient targets. **Results:** Body weight decreased (P < 0.001) by 8.4 ± 1.7 kg (8.6 ± 1.7%) after 6 months. Fat mass and visceral fat mass were reduced (P < 0.05) by 6.4 ± 1.6 kg and 0.2 ± 0.1 kg, respectively. Lean mass decreased (P < 0.05) by 1.3 ± 0.6 kg. Systolic blood pressure was reduced (P < 0.05) by 10 ± 3 mm Hg, and diastolic blood pressure was reduced (P < 0.05) by 6 ± 3 mm Hg. Fasting glucose, insulin, insulin resistance, and HbA1c remained unchanged after 6 months of diet. LDL cholesterol and triglyceride levels decreased (P < 0.001) by 10 ± 4% and 15 ± 8%, respectively, after 6 months. HDL cholesterol levels decreased by 6 ± 3% from baseline to post-treatment. **Conclusions:** These preliminary findings suggest that ADF combined with a high protein/low carbohydrate diet is effective for lowering body weight, visceral fat mass, blood pressure, LDL cholesterol and triglyceride levels. However, this diet has no effect on glucoregulatory factors. While these preliminary findings are promising, they still require confirmation by a larger-scale clinical trial. While these preliminary findings are promising, they still require confirmation by a larger-scale clinical trial.

133. Kalamkar, Apurva; Ravindran, Sriram; Huang, Chun-Chieh and Mathew, Biji

**Engineered exosomes for ischemic injury treatment**

*Graduate / Professional - Bioengineering*
Retinal ischemia is a leading cause for impaired vision and retinal degradation. The traditional therapies focus on preventing the disease advancement and use intravitreal injections (anti-Vascular Endothelial Growth Factor (VEGF)), eye drops or laser treatment. Though effective in treating the symptoms, the underlying issue remains unaddressed. Stem cell therapy using mesenchymal stem cells (MSCs) has been evaluated as an experimental treatment option. Although traditionally isolated from the bone marrow, in this regard, dental pulp derived MSCs (DPSCs) can be ideal cells owing to their neural crest origin. However, drawbacks such as aberrant differentiation, dosage, cellular attachment and survival rates have hampered translational feasibility. On the other hand, MSC derived extracellular vesicles (EVs) have been shown to be the principal agents of MSC paracrine function. In this study we engineered the DPSCs and tested DPSC derived EVs and engineered DPSC EVs to treat R28 retinal cells. The results indicated EVs being endocytosed by retinal cells in vitro in a dose, temperature dependent and saturable manner. Also, the uptake of EVs by retinal cells significantly increased the proliferation rate. When treated with EVs in oxygen-glucose deprivation condition, it reduced cell death and attenuated cell proliferation. In addition, EVs can bind to matrix proteins such as type I collagen and fibronectin. It binding to vitreous humor can significantly enhance functional recovery and reduce apoptosis in vivo. Overall, this study highlights the potential of DPSC-EVs in neuroprotection and regenerative therapy in retinal disorder.

134. Kamal, Ibtesam; Cavalcante dos Reis, Mariana; Alania, Yvette; Leme-Kraus, Ariene; Zhou, Bin; Chen, Shao-Nong; Pauli, Guido and Bedran-Russo, Ana

**Paradoxical Functions Of Galloyl Motif In Dentin Biomodification**

*Undergraduate - Restorative Dentistry*

**Objectives:** Camellia sinensis (CS) are rich in galloylated proanthocyanidins (PACs), which enhance the short-term mechanical properties of dentin matrix. However, galloyl moieties (GA) are susceptible to ester hydrolysis, which may explain the loss of dentin potency of GA rich extracts over time. The objective is to investigate the contribution of GA in mediating and sustaining dentin biomodification (mechanical properties and biodegradability). **Methods:** A GA knockout CS extract (CS) was produced from CS by selective enzymatic hydrolysis of GA with tannase followed by high-speed counter-current chromatography procedure to remove gallic acid. Depletion was confirmed by NMR spectroscopy. Mid-coronal dentin from human molars were cut into 6 x 1.7 x 0.5 mm specimens and demineralized with 10% phosphoric acid. Specimens were treated with extracts at 0.65% w/v in 20mM HEPES (pH 7.0) for 1 h and control with HEPES only. The complex modulus (E*) of dentin matrices was determined by dynamic mechanical analysis before and after treatment; and following 7 and 30
days incubation in simulated body fluid at 37°C. Biodegradability was assessed by dry mass loss before and after proteolysis (100 μg/mL Clostridium histolyticum) for 24 h at 37°C. Data were statistically analyzed using ANOVA and Games-Howell tests (α=0.05). **Results:** CS treated dentin presented statistically lower E* when compared to CS (p<0.001); and both groups were statistically higher than control (p<0.001). A significant 45% decrease in E* was observed as early as 7 days following biomodification with CS (p<0.001); while no effect of time was observed for control and CS (p>0.05). Dentin biodegradability was significantly reduced when treated with CS extracts (p<0.001), however not affected by GA (p=0.144). **Conclusions:** While key contributor of dentin biomodification, galloyl moieties are susceptible to hydrolysis resulting in partial reversal of mechanical enhancements to dentin matrix. The resistance against enzymatic degradation does not rely on GA.

135. Kazmi, Maheen

**Examining Cortical mRNA Changes in response to THC exposure**

*Undergraduate - Psychiatry*

There is increasing evidence that adolescent THC exposure increases the risk for schizophrenia (SZ). DNA methylation is an often transcriptionally repressive epigenetic mechanism that is both sensitive to the environment and in neurons is highly stable, with no requirement for turnover over a lifetime. Thus, it is a plausible mechanism to explain how a temporary environmental exposure, such as THC, can lead to the often lifelong illness of SZ. Increased levels of enzymes that add methyl groups to DNA, DNA methyltransferases (DNMTs), associated with increased promoter methylation levels and reduced expression of GAD1, RELN, and BDNF have been reported in the postmortem prefrontal cortices (PFC) of patients with SZ. I hypothesized that THC treatment of mice or primary cortical neuron cultures would increase Dnmt gene expression associated with a reduction in Gad1, Reln, and BdnfXa mRNA expression. C57BL/6J mice were treated with THC 10 mg/kg i.p. and measured PFC changes in gene expression after 1 and 6 hours. Mouse primary cortical neuron cultures were prepared from E18 C57BL/6 mice. mRNA expression of Dnmt1, 3a, 3b, Gad1, Reln, and BdnfXa normalized to Hprt1 was measured using qRT-PCR. In agreement with my hypothesis, THC increased Dnmt1 and Dnmt3a expression in the PFC at 1 hour. Additionally, THC reduced BdnfXa and Gad1 mRNA expression at 1 hour, and reduced Reln after 6 hours in the PFC. In neuron cultures, THC 10nM at 6 hours increased Dnmt1, Dnmt3a and Dnmt3b mRNA expression, and co-treatment with the CB1 antagonist CE-178253 prevented Dnmt1 and 3a increased expression. THC also reduced Reln and BdnfXa mRNA expression in cultured neurons. These results provide
the first evidence, to our knowledge, that THC affects expression of Dnmts and genes highly implicated in SZ.

136. Khan, Hamna and Okorie-Awe, Clara

An Investigation of Undergraduate Pre-Health Professional Student's Perceptions of Stress, Anxiety, Depression and Happiness: A Mental Health Consideration

Objective: To investigate UIC undergraduate pre-health professional students on their perceptions of stress, anxiety, depression, happiness, and to determine if their career pathways is a factor. Methods: This is a cross-sectional design based on sample convenience. In fall of 2018, pre-health professional students from the following student organizations: pharmacy, medicine, dentistry, nursing, and physical and occupational therapy, were administered validated surveys, such as the Perceived Student Stress (PSS), Hospital Anxiety and Depression Scales (HADS), and the Subjective Happiness Scale (SHS). The survey instrument consisted of six sections to complete. The surveys were administered online through Qualtrics. The survey was sent to all undergraduate classification levels (freshman, sophomore, junior, senior, fifth-year seniors and above). Approval was sought from UIC Institutional Review Board and approved with protocol number 2018-1313 Results: A multivariate statistical analysis was conducted to measure stress, anxiety, depression and happiness differences for each pre-health professional programs that subjects were interested in pursuing. Factor analysis was conducted to group survey responses into casual constructs. A total of 700 surveys were sent to the targeted student population. Of which a preliminary total of 300 (43%) responded.

137. Khan, Rida and Mohr, Justin

Synthetic studies towards Chrysindin A and B

Undergraduate - Chemistry

Chrysindin A and B are natural products, extracted from the flowering plants of Chrysanthemum indicum, and are mainly found in parts of Asia. Active ingredients of the Chrysanthemum indicum plant, from which the molecules chrysindin A and B were extracted, have been used in traditional Chinese medicine for treating vertigo, headaches, and various acute illnesses such as bacterial inflammation, however chrysindins A and B have not yet been evaluated in pure forms. Chrysindins A and B contain a unique diyne group which has been a synthetic challenge for organic chemists. We have proposed to synthesize these natural products through the use
of an atypical Pauson–Khand reaction, which allows the cycloaddition of an alkyne, alkene, and a carbon monoxide molecule to form a cyclopentenone. The synthesis of this molecule can allow the synthesis of more complex molecules and be of use to medicinal chemistry and pharmacology.

138. Khan, Shahzeb; Shaaya, Mark; Brennan, Martin and Karginov, Andrei

Selective Optogenetic Regulation of Protein Kinases

Undergraduate - Biological Sciences

Protein kinases are enzymes that are important in cellular function as they can activate and deactivate other proteins. They are involved in many cellular processes such as mitosis, metabolism, and cell signaling. Src family kinases (SFKs) are a well known group of oncogenes with homologous structures but different expression patterns and locations in the cell. They have been found to regulate many different cellular processes and mutations of these kinases has been linked to certain cancers. Although much study has been done, the unique roles of these kinases are not known due to the lack of selective regulation mechanisms. Here we have inserted a light-regulated (LightR) domain into the kinases Lyn, Yes, and Fyn, that allows specific and reversible regulation. The engineered LightR domain consists of two proteins that dimerize when exposed to blue light. When LightR was inserted into the catalytic domains of Lyn, Yes, and Fyn, we created kinases that were controlled by light. Upon illumination with blue light, we see activation of the kinases which can be reversed by putting them back in the dark. Computational analysis showed that activation of the kinases induced morphological changes such as cell spreading, protrusive activity, and formation of long, thin extensions. Activation of LightR Fyn led to translocation of the kinase along with a two-fold increase in cell area. Different mutants of these kinases, known as Fast Fast mutants, were also created which displayed different levels of activity. These mutants were created by single amino acid substitutions in the LightR domain. These results demonstrate how it is possible to selectively control activation of SFKs. This method could also be applied to other kinases with similar structures. Additionally, this could be used to determine the unique roles of SFKs.

139. Kilpatrick, KiAundra; Russo, Angela; Dean, Matthew; Zinc, Katherine; Sanchez, Laura and Burdette, Joanna

Role of Norepinephrine in Fallopian Tube Epithelial Cell Recruitment and Primary Metastasis of Ovarian Cancer
High-grade serous ovarian cancer (HGSOC) is the fifth leading cause of cancer death among women in the United States, but methods for early detection and prevention remain limited. The initial body of work attributing carcinoma origin to the ovary has been rethought upon finding precancerous lesions in the fallopian tube (same as oviduct in mice) and HGSOC risk reduction following salpingectomy (fallopian tube removal). However, the events that drive primary metastasis of fallopian tube epithelium (FTE) derived tumor formation remain unknown. Following the discovery of beta-adrenergic receptors on the surface of ovarian cancer cells, studies observing the effect of stress hormones revealed norepinephrine (NE) as a major mediator of cell invasion. Concurrently, studies testing the effects of beta-blockers in advanced stage ovarian cancer patients show improved clinical outcomes by 54%, suggesting that NE may play a role in metastatic progression. The effects of NE on fallopian tube cells, however, have not been tested. Our preliminary data via imaging-mass spectrometry has confirmed that the ovary secretes NE when in co-culture with murine oviductal (MOE) epithelial cells, implicating NE in the invasion of MOE cells to the ovary. NE mediated invasion was further increased in the presence of mutant p53. Therefore, we hypothesized that the migratory and invasive capacity of MOE cells will be enhanced in the presence of NE, and confirm our preliminary data. In order to test whether PTENshRNA + p53R273H cells secrete a factor that drives ovarian NE production, media was conditioned on murine oviductal epithelial (MOE) SCRshRNA and MOE PTENshRNA + p53R273H and collected after three days for analysis using high-performance liquid chromatography. To test if NE drives migration, a Boyden chamber with matrigel was used to track the migration of PTENshRNA + p53R273H FTE cells in the presence of NE and propranolol -- a beta-adrenergic receptor 2 antagonist. Finally, the ability of NE to drive ovarian colonization/primary metastasis was measured using PTENshRNA + p53R273H FTE cells that were tagged with red fluorescent protein to observe cell attachment to the ovary. Identifying whether NE mediates the migration and invasion capacity of MOE cells may be useful in elucidating the mechanism behind early ovarian carcinoma metastasis.

140. Kim, Eunice; Perkowski, Mark; Dhakal, Radhika; Surma, Victoria and Warpeha, Katherine

Phe and Specific Flavonoids Have a Role in Development and Stress Responses of Trichomes, an Epidermal Structure of Plants.

Undergraduate - Biological Sciences

Phenylalanine (Phe) is an amino acid that has the ability to play a significant number of roles in development in young plants. Phenylpropanoids made from Phe
are able to contribute to the cellular defense systems of young plants by directing
development of the epidermis, and strengthening the cuticle layer. Within the cell,
one of the most important functions of Phe is its regulation of reactive oxygen
species (ROS). In my research project, I explored the role of the cuticle and
associated specialized structures in plants mutant for synthesis of Phe and
flavonoids made from Phe. Using specific mutants I scored physical and chemical
phenotypes and explored responses to stress. Microscopy and biochemical
markers were used to study the impact of Phe and phenylpropanoids. I
demonstrate that Phe and specific flavonoids have a role in the 3-dimensional
structural design of the trichomes (an epidermal structure), but also the extent of
the protection of the epidermis from abiotic (non-living) stress common in the
environment, like chilling, heat and UV.

141. Kim, Hanae

K-pop is more than just a motivation: Significance of Pop-Culture on
Language Development and Literacy Practice

Graduate / Professional - Literacy, Language and Culture

The non-Korean heritage language learners at a four-year state university in the
Midwest are excited to learn the Korean language and culture. Most of them learn
the language due to their interest in Korean popular culture, and despite the fact
that it is their first Korean language class, they will come to the class with abundant
knowledge in the language and culture due to their active use of various digital
technologies such as videos and website from the Internet, social media and
mobile applications. Thanks to the easy accessibility to various resources due to
the advanced digital technologies, many students are exposed to the language
learning opportunities, yet, it is easily assumed that the non-heritage students have
lesser language exposure or knowledge in the Korean language than the Korean
heritage students. Through interviews with four students from the Korean language
classes, we found that these students use various internet websites and mobile
applications and watch videos on YouTube to learn the language. Second, they not
only create a friendship in person but also create online affinity spaces and make
transnational and international friends. Lastly, they constantly used their social
media or instant messaging application to communicate with their classmates and
friends and practice the language. These students shared that the Korean
language class was a place for them to breathe in their busy college life because it
was truly what they wanted to learn and that they will always seek for more
opportunities to practice and learn the language. The study shows that the
educators should value all type of resources and activities that happen outside of
the classroom and help students to connect their interest to other academic disciplines.

142. Kim, Jeana

**COPD Assessment Test and the presence of multi-morbidities in patients with asthma, COPD, and asthma-COPD overlap syndrome**

*Undergraduate - Biology*

Background/Methods The COPD Assessment Test (CAT) is an eight-question questionnaire specific for COPD patients that globally assesses the impact of COPD on health status. More symptomatic patients are classified by a cutoff score of 10. The CAT was validated using the St. George’s Respiratory Questionnaire, a 50-item quality of life questionnaire that can be used for patients with COPD or asthma. Previous studies have shown that the presence of multi-morbidities increased CAT scores in COPD patients. One study in Japan showed similar CAT scores in patients with asthma versus COPD, but to our knowledge, this has not been repeated in the United States. It is also unknown if multi-morbidities in asthma patients increase CAT scores. The aim of this study is to compare CAT scores of patients with COPD, asthma, and asthma-COPD overlap syndrome (ACOS), and see whether the presence of multi-morbidities can increase CAT scores. It is hypothesized that the CAT may be useful to assess health status in patients with asthma and that the presence of specific multi-morbidities such as heart disease may lead to elevated CAT scores in asthma and/or COPD patients. Data was obtained from the REDEFINE Study, in which 191 patients had baseline demographic/medical information collected and their CAT scores measured.

Results Of 191 patients, 151 (79.1%) had asthma only, 14 (7.3%) had COPD only, and 26 (13.6%) had ACOS. Asthma only patients had an average CAT score of 13.7±8.7. COPD only patients had scores averaging 19.9±7.6. ACOS patients had scores averaging 22.3±9.7. Asthma only patients with heart disease had CAT scores averaging 16.6±8.6, while patients without had scores averaging 13.4±8.7. Conclusion Patients with asthma only had an average CAT score ≥10, indicating that the CAT may be useful for asthmatics. The presence of heart disease also led to an increased CAT score in asthmatics.

143. Kim, Ko Eun

**Impact of the Tax Cuts and Jobs Act on U.S. Business**

*Undergraduate - Accounting*
The Tax Cuts and Jobs Act (TCJA), after it was finally approved and passed by Congress, was enacted into law as President Donald J. Trump signed the bill on December 22, 2017. This new law was one of the most significant changes to the tax code in decades, impacting both individual and corporate income tax in significant ways. It promised to lift business investments along with higher job creation and wage growth. Is it working? More than one year after the enactment of TCJA, this paper examines its impact on U.S. business. Using fundamental accounting data of publicly traded companies listed in the Standard & Poor's stock market index known as S&P 500 from CRSP and Compustat along with aggregated macro data from the Bureau of Labor Statistics, time series intervention analysis technique known as an autoregressive integrated moving average (ARIMA) modeling with intervention is conducted. This paper finds that the corporate net profit margin increased notably in 2018; however, it does not find statistically significant increases in employment nor wages growth yet.

144. Koertgen, Jacob

Perspectives of Corruption in Chicago

Undergraduate - Political Science

Chicago's reputation as “the most corrupt metropolitan region in America” proceeds it as 32 Alderman have been tied to corruption cases since 1972. Despite public opinion polls showing that a majority of Chicago Residents have a negative persecution on city hall and a majority of Chicago residents viewing city hall as corrupt. However, according to the research conducted in this paper, many Chicago residents on the northwest side of Chicago in different aldermanic wards do not seem to find their Alderman corrupt despite viewing city hall as corrupt itself. Therefore, this paper seeks to find explanations as to why residents in the Northwest side of Chicago find city council, and by extension the alderman, corrupt, yet not finding any shortcomings with their long standing alderman.

145. Kotak, Alpa; Ren, Jinhong and Johnson, Michael

Virtual Screening to Identify Potential Inhibitors Against the Dengue Viral NS2B/NS3 Protease

Graduate / Professional - Bioengineering

Infection by the Dengue virus (DENV), a globally prevalent mosquito-borne flavivirus closely related to the Zika virus (ZIKV), yellow fever virus (YFV), hepatitis
C virus (HCV), and West Nile virus (WNV), frequently leads to life-threatening diseases such as Dengue hemorrhagic fever and Dengue shock syndrome, thus making it a leading cause of death in tropical and subtropical regions. There are currently no vaccines or drugs approved by the FDA for Dengue treatment. The DENV RNA genome encodes a single polyprotein, which is cleaved by host proteases into three structural and seven non-structural proteins, two of which form a single essential viral protease complex, the NS2B/NS3 serine protease, which is also expressed in other flaviviruses like ZIKV and WNV, and is required for replication and assembly of new virions. Thus, the DENV NS2B/NS3 protease is an attractive target due to its essential role in viral replication. Therefore, virtual screening was performed using a protein-protein interaction (PPI) chemical library containing over 100,000 compounds, to predict potential inhibitors against the active site of the DENV NS2B/NS3 protease (PDB ID: 3U1I) by the GOLD protein-ligand docking software. The top 100 highest scoring compounds predicted by GOLD were further narrowed down with the calculation of the relative binding free energies using a more robust scoring function which takes into account the solvent effects on protein-ligand binding, the Molecular Mechanics/Generalized Born Surface Area (MM/GBSA) method from the Schrodinger software suite. Following that, the twenty-five highest ranking compounds were subject to molecular dynamics (MD) simulations using the AMBER software suite. The top ten most structurally diverse ligand compounds with the highest predicted binding free energy estimated from MD simulations will undergo in vitro experimental assays to measure their binding affinities to the DENV NS2B/NS3 protease and validate them as potential inhibitors against the DENV NS2B/NS3 protease.

Koto, Nicholas-George; Alshreimi, Abdullah S.; Reidl, Tyler W.; Zhang, Robert; Wink, Donald J. and Anderson, Laura L.

Cycloadditions and Sigmatropic Rearrangements of N-VinylNitrones

Undergraduate - Chemistry

N-heterocyclic molecules serve a major role in both medicinal and synthetic chemistry and for good reason. In 2010, 143 of the Top 200 grossing name brand drugs sold in the United States contained at least one heterocycle and of those 143, 119 contained at least one N-heterocycle. It for this reason that the discovery of new heterocycles along with facile methods to synthesize these molecules is vital in chemical research. The Anderson group is dedicated to developing new transformations utilizing N-vinylnitrore and N,O-divinylhydroxylamine intermediates to access complex functionalized N-heterocycles. The most recent efforts of the Anderson group have focused on the utilization of a [3+2]-cycloaddition and [3,3]-sigmatropic rearrangement cascade of benzyne intermediates with N-vinylnitrones synthesized from keto-oximes and vinylboronic acids to efficiently access complex
heterocycles with high levels of diastereoselectivity. As a contribution to these efforts, I have been heavily involved with synthesizing and purifying three different N-vinyl nitrones, along with their precursors for their use in our current project. Prior to this work, my involvement in the Anderson group focused on the production of similar N-vinyl nitrones for their use in 4π-electrocyclization to access highly substituted azetidine scaffolds. The optimization, mechanism, and scope of these reactions will be discussed to highlight the fundamental reactivity of the intermediates involved in these transformations.

147. Kpatah, Eunice

The Media's Role in the Yemeni Conflict

Undergraduate - Political Science

Since March of 2015, the Yemeni civil war has claimed thousands of lives in Yemen and has become the world’s largest humanitarian crisis. It is moreover, the duty of the media to draw our attention to this crisis. Hence, this project explores the differences in the ways Western newspapers and non-Western newspapers cover the Yemeni conflict as well as what might account for these differences. My expectations for this research is that Western countries further away from Yemen may not be well informed about events leading up to the civil war and would be more likely to see the war from a humanitarian perspective to appeal to the public and local organizations to take action whereas, a country like Egypt not far away from Yemen and has played a major role in the civil war would have stories from newspapers that are more likely to see the war from a political point of view.

148. Kubaitis, Emily

Letters from 19th-Century France: The Everyday Lives of a Family of Notaries in Esternay

Undergraduate - French and Francophone Studies

In this project, I examined how informal correspondence among friends and family members can offer insight into an unfamiliar, historically distant way of life. I read and contextualized letters on an online archive provided to the public by Carleton College. Written by several generations of the Poirrier family in Esternay, France, the letters serve as my means of exploration. I placed a special focus on letters between women and letters involving the family’s notary business. The exploration of these letters raises broader questions surrounding the study of the everyday. What was everyday life like for women from a provincial French town in the late
19th century? How does a family of notaries lead their everyday lives? To what extent does the act of writing a physical letter differ from other forms of communication in both 19th-century France and today? During my discovery, I used non-archival sources to contextualize the content of the letters, make profiles of family members, and explore the complexities of the everyday life of notaries.

149. Kuchta, Ashley; Benson, Brittany; Rodriguez, Karla and Coumbe-Lilley, John

The Unseen Harm of Sport Injury Recovery

Undergraduate - Kinesiology

Background: This presentation explores the emotional experiences of athletes who suffered injuries others could not see. Their narratives are contrasted with the Grief Response Model presented by Kubler-Ross (1969), a widely taught model explaining emotional recovery in the field of sport psychology. Objective: This narrative examined the emotional recovery of athletes with injuries that cannot be physically seen, compared to the five stages of grief. Subjects and Methods: The study compared the emotional recovery of two athletes following severe injury. Subject 1, female, anemic, aged 24, competitive amateur marathoner. Subject 1 completed a recorded semi-structured interview face to face interview for 61 minutes that yielded a 23 page transcript. Subject 2, male 28, TBI American Football High School Varsity) completed an 89 minute recorded semi-structured interview which yielded a 33 page transcript. The audio was listened to 12 times. Transcription of the interview reviewed and coded 3 times. Thematic analysis was conducted with the research team and external member checking validated the findings. Results: The themes are extracted to understand what was important to the subjects. Their lived experiences were discussed by three dominant themes: 1) struggle with social support (emotional, informational, tangible, instructional). 2) mental toughness, 3) no evidence for the application of the grief model for understanding their experiences. Conclusions: This study showed unique emotional recovery responses that were not linear. These athletes continue suffer because other individuals did not recognize their injuries and treated them as being less tough meaning less capable of performing. Keywords: Grief Response Model; Sport Injury; Physically Unseen; Emotional Recovery; Rehabilitation

150. Kula, Nicole and McGinley, Andrea

The Effects of Fixation and Staining on Cell Viability
My research is to investigate the viability of bacterial cells within a smear using different fixation techniques. A smear is a single layer of bacteria on a glass slide that can be analyzed under the microscope. A common belief is that the purpose of heat fixation is to adhere the cells of a smear to the glass slide and to also kill them in the process. This has also been published in several microbiology lab manuals. This research is to determine whether the cells are in fact killed after heat fixation or methanol fixation and if not, at what point, if any, are all of the cells killed within the smear during the steps of a Gram stain. If the cells remain viable on the slides after fixation, then the fixation method is not effective in killing the cells. I investigate the different variables of fixation and Gram staining to determine under what conditions cells are able to survive on a fixed smear.

151. Kulkarni, Gauri; Hauser, Kyle; Romanova, Liudmila and Janson, Christopher

**Contribution of Active Transport to Amyloid Clearance by Meningeal Lymphatic Cells in Alzheimer’s Disease**

*Undergraduate - Neurology and Rehabilitation*

Accumulation of amyloid beta peptides (Aβ) in the cognitively important brain regions is one of the hallmarks of Alzheimer’s Disease (AD). It has been established that insufficient clearance of Aβ from the brain contributes to AD pathology at early stages of the disease. One of the known routes for Aβ clearance is vasculature of the blood brain barrier. Recent studies show that lymphatic vessels of the meninges also contribute to Aβ clearance. However, molecular mechanism is unknown. Our data demonstrate that lymphatic endothelial cells, which comprise the vessels in the meninges, are able to take up Aβ through energy-dependent pathways. In this study, we aim to understand the exact molecular mechanism through which Aβ is cleared by the lymphatic vessels. Using molecular probes and inhibitors specific to different types of endocytosis, we show that lymphatic cells are capable of both clathrin-mediated and caveolae-mediated types of endocytosis. Therefore, our hypothesis is that endocytosis is involved in Aβ uptake from surrounding fluids by lymphatic endothelial cells. We tested this hypothesis in in vitro experiments with primary lymphatic endothelial cells isolated from wild-type and rat model of Alzheimer’s (TgF344-AD rat). The cells were exposed to synthetic Aβ peptides with or without inhibitors of clathrin – or caveolae-mediated endocytosis. Lymphatic endothelial cells were found to be uptaking Aβ through both, clathrin-mediated and caveolin-mediated pathways. Understanding the mechanism of the clearance of Aβ by the meningeal lymphatic vessels and how their function is involved in the development of Alzheimer’s, will
provide valuable information for future development of therapeutics targeting early stages of Alzheimer’s pathology.

152. Kumar, Girish and Reddy, Krishna R.

**Fundamental Characterization and Modeling of Coupled Processes in Bioreactor Landfills**

Graduate / Professional - Civil and Materials Engineering

Many engineered landfills that accept municipal solid waste are regarded as "dry tomb landfills" due to the low moisture conditions within the waste, because of which the waste degradation occurs slowly. An alternative to the conventional landfills are bioreactor landfills. In bioreactor landfills, the collected leachate (chemical liquid derived from waste degradation) and other permitted liquids are recirculated into the landfills to enhance the moisture conditions within the waste and thereby accelerate waste degradation. This offers numerous benefits including enhanced biogas (thereby energy) production and early waste stabilization, among others. However, the effective and safe design, construction and operation of the bioreactor landfills is not well understood. This is mainly due to the lack of knowledge on the different landfill processes (e.g., hydraulic, mechanical, biochemical, thermal) and their coupled interactions within the waste that ultimately influences the holistic performance (e.g., slope stability and integrity of liner and cover systems) of a landfill. The waste management industry currently lacks a comprehensive numerical model that simultaneously accounts for all the different processes and their coupled interactions accurately for evaluating the coupled behavior of waste in bioreactor landfills. The overarching goal of this research is to develop a practical and reliable coupled thermo-hydro-bio-mechanical model that can enable safe design and operation of stable, effective and sustainable engineered landfills, thereby minimizing immediate as well as long-term risks to the environment and public health. Upon successful validation, the numerical model could be used by designers and practitioners to reliably predict biogas generation, landfill settlement, and more importantly the waste stabilization time thus allowing for the planning of beneficial reuse of landfill space (recreational facilities) or reuse of landfill airspace for the fresh waste. This research will equip the industry with a tool that can help transform the conventional passive isolated waste containment systems into in-situ active anaerobic waste treatment facilities.

153. Kumar, Naveen
Beyond Test Scores: Effects of Attending 'Good' Public Schools in India

*Graduate / Professional - Economics*

Indian society, largely segregated on caste, has long been suffering from significant inequalities in education, health, employment opportunities, and income. I study the impact of having the opportunity to attend a `good' public school, with emphasis on the more disadvantaged segments of the population in India. The ``model'' schools program, launched in 2009, admits students through an entrance exam enabling me to use a Fuzzy Regression Discontinuity Design methodology. Using three student-level administrative datasets, I track the students who appear for the entrance exam in fifth-grade at two other future points: tenth-grade and pre-university. As a result, I group the findings into two categories: high school outcomes, and outcomes beyond high school. For high school outcomes, attending a model school (i) increases the prob. of graduating high school by an insignificant 4.25 percentage points (p.p), (ii) increases the prob. of obtaining a distinction (85 and above) in tenth-grade by 9 p.p, (iii) leads to scoring six and a half points more in math, three points more in science, and four points more in social science on average, all statistically significant. For outcomes beyond high school, the results suggest that attending a model school (i) has no effect to some positive effect on the prob. of continuing schooling, (ii) reduces the prob. of choosing the science stream in Pre-University college by seven p.p, and (iii) increases the prob. of choosing the commerce stream by nine p.p. Using rich administrative data on student characteristics, I further explore the effects for various groups based on gender, caste, the medium of instruction prior to joining a model school and the distribution of the school-by-category cutoffs within each school.

154. **Kumar, Priya; Bhatt, Sivam; Kaplan, Nihal; Sia, Michelle; Somalwar, Amit and Perez White, Bethany**

**Loss of EphA2 inhibits GATA-3 transcriptional function leading to a terminal differentiation defect**

*Undergraduate - Dermatology*

Epidermal differentiation involves complex signal transduction networks. Often, these signal relays depend on the transmission of cues from the plasma membrane to the nucleus to control gene expression. Receptor tyrosine kinases (RTKs) are integral in orchestrating intracellular communication cascades to induce differentiation. We have shown loss of EphA2 RTK causes a differentiation defect in 3D reconstituted human skin (3D RHS) resulting in tight junction catastrophe. This defect is also characterized by ablation of the granular and cornified layers, further suggesting EphA2 promotes terminal differentiation. In
EphA2-deficient (shEphA2) 3D RHS we show significant loss (>75%, P<0.05) of loricrin, filaggrin, and involucrin at protein and mRNA levels, indicating EphA2 signaling impacts keratinocyte differentiation at the transcriptional level. GATA-3 is a key driver of differentiation-associated gene expression in epidermis. Yet, the upstream signaling leading to GATA-3 transcriptional activity is unknown. We show by immunofluorescence that GATA-3 is mainly expressed in the nuclei of suprabasal keratinocytes in mature 3D RHS, mimicking the expression pattern of normal human skin (~35%+, R2=0.99, P=0.05). In a time course of developing 3D RHS, GATA-3 nuclear expression is absent 3 days after lifting to the air-liquid interface, but is prominent starting at day 6 and persists through days 9 and 12. This expression of GATA-3 is lost in shEphA2 3D RHS, where only 5% (P<0.001) of cells are positive at day 6. In 2D cultures, GATA-3 accumulates in the nucleus in control cells (48.6%+) 24 h after calcium-induced differentiation, but to a lesser extent in shEphA2 cells (12.5%+, P<0.01). This loss of expression in shEphA2 cells results in a loss of GATA-3-driven transcription indicated by a 65% (P<0.001) decrease in GATA binding activity in a promoter luciferase reporter assay. Taken together, these results indicate that EphA2 promotes GATA-3 nuclear accumulation and positively regulates the transcription of terminal epidermal differentiation genes.

155. Kumar, Wasan; Ribeiro, Marta and Balla, Andre

**Cadmium-induced Macrophage LDL and Oxidized LDL Internalization**

*Undergraduate - Pathology*

Environmental cadmium exposure has been established as a promoter of vascular inflammation and atherosclerotic risk factor. Inflammation initiates foam cell formation, a crucial step in atherosclerosis, by increasing macrophage LDL phagocytosis. This link suggests cadmium may increase atherogenesis by upregulating scavenger receptors, which function to bind LDL and oxidized LDL (OxLDL). RAW 264.7 (murine) macrophages were incubated in a media solution treated with 2 µg LDL and 10 nM, 50 nM, and 200 nM CdCl2 concentrations for 48 hr. Cells were stained using Oil Red O (lipid sensitive dye) and imaged using a microplate reader at 500 nm. LDL was oxidized by incubation in 10 µM CuSO4 and centrifugal filtration in a PD-10 spin column. OxLDL was diluted to 2 µg/ml and applied to macrophage cells followed by Oil Red O staining and absorbance measurement with the aforementioned conditions. In vivo studies for measurement of serum LOX-1, CD-36 and SR-A I/II were also performed. LOX-1, CD-36, and SR-A I/II are the main macrophage receptors for LDL and OxLDL. ICR male mice were exposed to cadmium through drinking water for 8 weeks. Mice were sacrificed and serum was extracted for assessment of scavenger receptor expression by ELISA assay. Oil Red O staining of RAW 264.7 cells incubated with
2 µg LDL, 2 µg histones and 10 nM, 50 nM, and 200 nM CdCl2 showed significant dose-dependent increases in lipid absorbance. Those at the highest CdCl2 concentrations showed the largest increase in LDL uptake. Similar results were found in macrophage cells incubated with 2 µg OxLDL. The serum ELISA demonstrated cadmium exposures causes upregulation of SR-A. Our data indicates cadmium modulates macrophage function to promote LDL and OxLDL uptake. We are currently studying the in vitro function of major scavenger receptors to understand the mechanisms for adverse cadmium effects on macrophages.

156. Kunakom, Sylvia and Eustaquio, A. S.

Development of a Bacterial Host for Antibiotic Discovery and Production

Graduate / Professional - Medicinal Chemistry and Pharmacognosy

The majority of FDA-approved antibiotics are microbial natural products; however, there has been fewer therapeutic discoveries within the past decade. Bacterial genomes encode a large and mostly untapped capacity for antibiotic biosynthesis. One of the emerging sources of antibiotics is Burkholderia, gram-negative bacteria belonging to the Betaproteobacteria class. Each Burkholderia genome contains about 20 biosynthetic gene clusters (BGCs) encoding metabolites of various biosynthetic classes. However, challenges in accessing these encoded metabolites include poor expression under laboratory conditions and low production yields. In order to realize the full extent of genome mining for antibiotic discovery and production, heterologous expression can be used to streamline discovery. The synthetic biology community is moving away from the idea that “one host fits all”, and the current paradigm is to develop hosts tailored to the source of BGCs, that is, choosing hosts that are phylogenetically closer to the source of incoming DNA. We report here the development of a Burkholderia host. As a proof of concept, we chose to express a lasso peptide BGC encoding the biosynthesis of capistruin. Our results demonstrate that capistruin yields using our host is at least 100-fold higher than with the native producer, B. thailandensis. We are currently further optimizing the host, including the characterization of diverse promoters that can be used in pathway construction. We also plan to apply this host in genome mining efforts towards antibiotic discovery. There are currently >2,000 Burkholderia genomes available in public databases. Our developed host is expected to greatly facilitate tapping into the wealth of biosynthetic potential available in Burkholderia genomes.
Research Strategies of Home-based Exercise Program RCTs for Older Adults with Cognitive Impairment: A Systematic Review

Undergraduate - Liberal Arts and Science

Background: Exercise is a promising non-pharmacological intervention to improve function in older adults with cognitive impairment. Home-based exercise is particularly promising, because exercising in a familiar environment may enhance adherence. A meta-analysis of randomized controlled trials (RCTs) of long-term exercise home and community-based programs found improved function among older people with cognitive impairment. This systematic review by Lewis, et al. identified only 2 RCTs conducted in home settings as of April 2016, suggesting challenges in conducting research with persons with cognitive impairment in home settings. Question: This study updated Lewis et al.’s literature review (through January 2019) and synthesized the research strategies of previous RCTs of home-based exercises for older adults with cognitive impairment, focusing on the target population and recruitment, intervention programs, and outcome measurement, to inform future home-based exercise RCTs. Designs: A systematic literature search was performed based on a search strategy adapted from Lewis et al. (2017) for electronic databases (Embase, Cinahl, Medline) covering the period between April 2016 and January 2019. Results: Out of 137 unduplicated articles identified, 6 articles met the study inclusion criteria. With the addition of the two home-based RCTs identified by Lewis, et al., our review included eight articles. The target population of the intervention ranged from those with mild cognitive impairment to those with mild to moderate Alzheimer’s Disease. Exercises tested were easy to follow but sufficient in intensity, including some that were tailored to the participant. The exercises ranged from durations of 3-12 months and included reminder tactics to adapt to the memory loss of this population. Conclusions: Implementing home exercise RCTs for older adults with cognitive impairments is feasible. Further studies are needed to produce stronger evidence with larger sample sizes, incorporating research strategies and lessons learned from previous studies in order to maximize retention, feasibility, and efficiency.

Optimization of the expression and purification of Zika virus NS5 protein

Undergraduate - Biomolecular Sciences

Optimization of the expression and purification of Zika virus NS5 protein

Undergraduate - Biomolecular Sciences
Zika virus is currently occurring throughout South America, Central America, the Caribbean, and the United States. Over 1 million people have contracted the virus around the world. Zika virus is an arbovirus which is an infection that’s transmitted through certain arthropods. This is a life-threatening illness that symptoms develop in a few days to a week after an infection. Common symptoms include mild fever, skin rash, headaches, and conjunctivitis. One of the reasons that Zika virus is a big concern lately is not only from the infection itself but the late consequences, particularly in pregnant women. Zika virus can cause microcephaly which is when a child is born with an abnormally small head and therefore abnormally small brain size. Zika virus NS5 is a large protein with approximately 116 kDa and it is responsible for the replication of the viral genome which is a prime target for drug discovery. The main purpose of this project is to optimize the expression and purification of Zika virus NS5 protein to obtain a high concentration and yield for assay tests. For the protein expression, the Zika virus NS5 plasmid will be transformed into chemically competent cells. The protein will be purified by using an immobilized metal ion affinity column (IMAC) and a size exclusion column. Here, we present our preliminary work towards optimizing the expression and purification of Zika virus NS5.

159. Withdrawal

160. Lai, Ellie; McMillan J. Neil; Fernhall, Bo; Baynard, Tracy and Hilgenkamp I.M., Thessa

Heart rate variability as an indicator of autonomic dysfunction during submaximal exercise in individuals with intellectual disability.

Undergraduate - Kinesiology/Nutrition

Background: Individuals with intellectual disabilities (ID) present with higher rates of morbidity than the general population, likely driven by low levels of cardiorespiratory fitness and physical inactivity. Studies in individuals with Down syndrome (DS), a subgroup of ID, have posited exercise intolerance may be partially due to dysfunction of the autonomic nervous system (ANS). ANS dysfunction may also be involved in exercise intolerance in individuals with ID. Purpose: To determine if individuals with ID display autonomic dysfunction during submaximal exercise as measured through heart rate variability (HRV), when compared to age and gender matched controls. Methods: Low-active, apparently healthy adults (n= 12, 30.1 ± 6.3 yrs) with mild (IQ =50-70) to moderate (IQ = 35-49) ID and controls matched for gender, age, and activity level (n=12, 29.8 ± 7.9 yrs) completed two seven-minute submaximal treadmill exercise bouts at 45% VO2peak separated by 20 minutes of seated rest. Heart rate was measured continuously with the Polar V800 series watch and assessed utilizing WinCPRS software to obtain indices of autonomic function. Non-normally distributed outcomes were logtransformed. Results: All participants showed a significant response to the exercise (Condition effect p < 0.05) for all HRV outcomes except for the ratio of the low to high-frequency mean (LnLF/HF). During the submaximal exercise perturbation, no significant interaction effect was observed for any HRV variables (p > 0.05), although a trend for significance was observed for RMSSD (ID: 18.5 ± 7.47 ms, Controls: 25.7 ± 9.07 ms; p = 0.05).
Conclusion: HRV measures demonstrated no significant differences in individuals with ID when compared to healthy controls during submaximal exercise. It must be noted that RMSSD, a primary time-domain measure indicative of vagal tone, displayed a trend for significance. Further examination is required to denote impact of ANS function in submaximal exercise in ID.

161. Lau, Ottissa and Corte, Colleen

**Future-Oriented Self-Cognition and Alcohol Expectancies in Preadolescence Youth**

*Undergraduate - Health System Sciences*

Underage drinking have been a continual serious concern nationwide. Prevention measures have been suggested during preadolescence years to counter persistent risky behaviors that could have significant self-harm, such as underage drinking, from occurring during adolescence. In this study, the relationship between future-oriented self-cognition related to drinker possible self, positive and negative alcohol expectancies, and ever drinking in preadolescence youth will be analyzed. Additionally, a secondary analysis of data from a previous study on alcohol use, alcohol expectancies, and drinker possible-self collected from Latino and Black 9 – 12 year old in the Chicago land area will be conducted.

162. Lenon, Pia Pauline

**Breastmilk and Low Birth Weight Infants**

*Undergraduate - Honors College*

The purpose of this research is to outline the current evidence on the impact of breast milk on low birth weight infants. This research seeks to understand what is currently known about how a low birth weight infant’s growth rate, defined by weight, is influenced by the use of breastmilk. Furthermore, this research seeks to delve into the insights of healthcare professionals with a background in the field of Mother-Baby Nursing on their opinions of breastmilk and what is routinely done in practice in order to illuminate whether practice and evidence are synchronous, or if there is a quality gap present. Literature searches were conducted using CINAHL, PubMed, and Google Scholar. Keywords: breastmilk, breastfeeding, low birth weight infants
163. LeRand, Haley

**Cultivating Well-being: Care and Healing in the Community Garden**

*Undergraduate - Psychology*

In challenging the Western notion that well-being is a solo pursuit, this research illuminates alternative, communal ways of thinking about well-being and what sort of practices nurture it. In particular, I explore what practices allow refugee gardeners at Global Garden Refugee Training Farm in Chicago, IL to cultivate well-being in new and unfamiliar environments. I argue that gardening communally is one such action that enables refugees to rebuild their world and foster a sense of place and healing, and that they execute this rebuilding through an ethic of care. Care, as Bernice Fisher and Jean Tronto (1990) describe, comprises “everything that we do to maintain, continue and repair ‘our world’ so that we can live in it as well as possible. That world includes our bodies, our selves, and our environment, all of which we seek to interweave in a complex, life-sustaining web.” This ongoing research explores how refugees care for plants, and in doing so, care for their bodies, minds, and communities. Qualitative in nature, this project employs ethnographic methods such as participant observation and semi-structured interviewing. Prior fieldwork in 2017 and 2018 showed care and healing to be salient themes, and it is expected that they will continue to be meaningful lenses of analysis. This research is significant because it engages the possibility that flourishing is possible despite travesties such as war, political unrest, and the deleterious effects of urbanization, and shows how community gardens can act as healing places that facilitate exchanges across class lines and cultures. Moreover, it sheds light on what sort of relationships with non-humans are possible and asks how these relations can inspire approaches to larger issues such as climate change. Finally, this project hopes to inform policy-makers on the importance of these spaces for communities, particularly those with refugee and low-income populations.

164. Levin, Aliza; Correa, Kelly and Shankman, Stewart

**Evaluating Differences of Recent Life Events on the Specificity of the Relationships between Stressors and the Subfactors of Internalizing Psychopathology**

*Undergraduate - Psychology*

Anxiety and depression are prevalent and costly public health burdens. In the U.S., in terms of combined indirect and direct costs, internalizing psychopathologies (i.e. anxiety disorders and major depressive disorder) are among the three most costly
conditions. Previous studies have established that major life events occurring in childhood and adulthood, can contribute to the onset and course of internalizing disorders. Studies evaluating differences in recent life events have yielded mixed findings as to the specificity of the relationships between stressors and the subfactors of internalizing psychopathology: fear disorders and distress-misery disorders. Consequently, the aim of the current study is to investigate the specificity of a variety of stressors to fear versus distress-misery disorders. The sample will be drawn from a larger NIH-funded study including 517 young adults between the ages of eighteen and thirty. This sample includes 170 individuals with current fear or distress-misery disorders, 238 individuals with remitted fear or distress-misery disorders, as well as individuals with a wide range of other psychopathologies and healthy controls.

165. Ley, Katherine

Mental Illness Monsters

Undergraduate - Psychology

It is no secret that the film industry sacrifices accurate portrayals for the sake of a good story, but horror films, in particular, have exploited mental illness in order to thrill and horrify their viewers. While this has the potential to bring issues surrounding this topic to the public eye, few have done so, favoring cheap thrills over deeper meaning. This is done by using a variety of negative tropes, but this study will focus on three: Mental illness as the antagonist, the scary asylum trope, and finally ghosts and gaslighting. By examining these three aspects of horror films, this project hopes to gain a deeper understanding of how this genre handles the subject of mental illness.

166. Lika, Lumnie; Hansen, Allison; Faulk, Naomi; Pham, Christine; Balu, Deebika; Valencia-Olevara, Ana and LaDu, Mary Jo

The Effect of Age, Sex and APOE Genotype on ApoE Lipidation and Aβ Aggregation in an AD Transgenic Mouse Model

Undergraduate - Biological Sciences

APOE4, the gene encoding apolipoprotein E4 (apoE4), is the greatest genetic risk factor for Alzheimer’s disease (AD), compared to common APOE3, with APOE2 protective but rare. In the brain, levels of apoE4 are lower than apoE2 and apoE3, likely the result of instability as apoE4 is poorly lipidated. AD is characterized by accelerated accumulation of amyloid-β (Aβ) peptide, which aggregates to form
both amyloid plaques and soluble oligomeric Aβ (oAβ), the latter a proximal neurotoxin. In humans, female (♀) APOE4 carriers have a greater risk for AD, rate of cognitive decline, and accumulation of Aβ compared to male (♂) APOE4 carriers. In EFAD transgenic mice (expressing human apoE isoforms and overexpressing Aβ42), we demonstrated a significant decrease in lipidated-apoE and an increase in soluble oAβ in 6-month (M) ♀and ♂E4FAD compared to ♀and ♂E3FAD mice. Thus, the goal of this project is to determine the interactive effects of age, APOE genotype and sex on apoE4 lipidation and soluble levels of Aβ42 and oAβ in EFAD mice. The cortices of 4-18M ♀and ♂EFAD mice were extracted via a 3-step sequential method, producing soluble (TBS), detergent (TBSX/triton X-100) and insoluble (FA/formic acid) fractions, with lipidated-apoE extracting in the TBSX fraction. Total-, TBSX- and FA-Aβ42 increased with age. Soluble oAβ levels increased with age in all genotypes (♂E3FAD<♂E4FAD<♀E3FAD<♀E4FAD), while soluble Aβ42 levels plateaued (♂E3FAD<♀E3FAD<♂E4FAD<♀E4FAD). This is critical as even in EFAD brain tissue, soluble oAβ tracks disease progression. Total- and FA-apoE levels increase with age. Importantly TBS-X apoE increases with age and genotype (E3FAD> E4FAD), with the exception of ♀E4FADs, which show no age effect. This suggests an age-induced compensatory that is absent in the ♀E4FAD. This age-induced increase in AD pathology mirrors the increased AD risk in humans (♂E3FAD≤♂E4FAD≤♀E3FAD<♀E4FAD). Thus, the EFAD mice serve as a viable therapeutic pre-clinical mouse model.

167. Lingutla, Srinivas

Smart Plant Watering System

Undergraduate - Computer Science

My project is called the Smart Water Planting System. Based on the temperature, humidity, and the weather conditions, the water planting system will make a decision on whether to water the plants. The system will analyze the weather conditions through a sensor and furthermore analyze the future weather conditions for the day and the week through a major weather station API. The system will consist of a Raspberry Pi and a micro-controller device (ESP8266) which acts as a Wi-Fi module and is connected to other sensors. The ESP8266 Wi-Fi development board also is responsible for making HTTP requests to get the information from the weather stations. The Raspberry Pi will act as an access point for the Wi-Fi module. After receiving the information from the module, the Pi will make smart decisions to calculate when to water the plant. The Pi is also connected to a moisture sensor which will be embedded in the plant. Using a 2-way relay, the Raspberry Pi will control the water pump used to water the plant.
168. Lizama-Chamu, Itzel; Cleary, Jessica and Sanchez, Laura

Chemical Communication of a Natural Cheese Rind Fungus with Pseudomonas vs. E. coli

*Undergraduate - Medicinal Chemistry and Pharmacognosy*

During the aging process of cheese production, diverse microbial species colonize cheese rinds to form a biofilm. Different fermentation methods alter the microbial composition of the cheese rinds. Previous studies have shown that cheese rinds represent a simplified model of a microbiome that can be experimentally manipulated and reproduced to elucidate pair-wise and community interactions of microbial species. Since the specialized metabolites that drive microbial interactions within these communities are poorly understood, we examined how a cheese fungus (Penicillium sp. #12) altered its specialized metabolites in the presence of either a natural cheese rind bacterium (Pseudomonas psychrophila sp. JB418) or a food pathogen (Escherichia coli). Specifically, we used mass spectrometry techniques to investigate the molecules produced by the fungus and bacteria in response to their interaction. Penicillium sp. #12 and bacterium P. psychrophila sp. JB418 grow commensally while E. coli was inhibited by Penicillium sp. #12. Therefore, we hypothesize that Penicillium sp. #12 excretes metabolites that interact with bacterial partners that produce different phenotypes in P. psychrophila and E. coli. Matrix-assisted laser desorption/ionization time-of-flight imaging mass spectrometry (MALDI-TOF IMS) was used to visualize the spatial distribution of the molecules produced in both pure bacterial and fungal cultures to quickly detect molecules involved in microbial interactions. Molecules produced in each interaction were extracted from a large-scale culture and analyzed via liquid-chromatography tandem mass spectrometry to obtain molecular fragmentation data. MALDI IMS data was used to prioritize signals for future isolation and purification using high-performance liquid chromatography to identify the molecule(s) responsible for different phenotypic expression. A long-term future direction of this research will help us to understand the impact the cheese microbiome may have on human health via dietary intake.

169. Lopez, Brenda

The Role of High Schools to Support Undocumented Students’ Transition to Higher Education

*Undergraduate - Teaching of History*
This research project focuses on how high schools and high school practitioners can support their undocumented student populations as they transition to institutions of higher education. Due to an unstable time regarding the future of undocumented immigrants in the United States, undocumented high schoolers face a number of obstacles. This research project is intended for practitioners in high school settings, particularly teachers and counselors. It is critical to provide resources to high school practitioners on how to communicate with vulnerable populations, like undocumented students. The research project is not intended to investigate how practitioners currently interact with undocumented students, but rather synthesize best practices from the literature. Thus, this research project becomes a guide for what these students are facing and what resources practitioners have to utilize to encourage pursuing higher education. This research project will be specifically relevant to practitioners working in communities in Chicago. This research project provides a contribution to an area where there has not been much research. Research has been done regarding undocumented college students and what obstacles they face, but very little has been done regarding undocumented high school students, especially on how practitioners interact with them. This research project encourages others to continue work in this burgeoning area regarding undocumented high school students as it is clear they deal with issues practitioners must be aware of. Keywords: undocumented, education, empathy, relationships, social support

170. Lowe, Claudia and Dubreuil, Ron

Pathways of Neurodegeneration Converge on Spectrin

Undergraduate - Biological Sciences

The increasing awareness of neurodegenerative disease mandates a need for a cure, which may be developed by unpacking the mechanisms of neurodegeneration. Recently, an unexpected connection was discovered between spectrin protein and Parkinson’s disease using a genetic model (ref. 1). Moreover, mutations of human beta-spectrin are known to cause a specific neurodegenerative disease known as spinocerebellar ataxia type 5 (ref. 2). Genetic manipulations of beta-spectrin in Drosophila produced a phenotype sharing some features with the Parkinson’s model of disease (ref. 3). This raises the question whether spectrin is a central element in pathways of neurodegeneration. My research aims to further develop the connection between spectrin and neurodegenerative pathways by genetically manipulating spectrin further in Drosophila. Rescue from neurodegenerative symptoms was achieved by overexpressing the alpha-spectrin subunit in Parkinson’s disease model flies (ref. 1). These results are consistent with the intriguing possibility that spectrin operates
downstream of mutations that cause neurodegeneration. I am testing this possibility by determining if the phenotype caused by beta-spectrin misexpression is also rescued by alpha-spectrin.


171. Luciano, Monica and Eldeirawi, Kamal

Relationships among acculturation, acculturative stress, psychosocial factors, and birth outcomes among pregnant Mexican American Women: An Integrative Review

*Undergraduate - Nursing*

Background: Little is known about how acculturation/immigration and acculturative stress correlate with psychosocial stress among pregnant Mexican American (MA) women and whether stress levels vary by country of birth among pregnant MA women. Objective: To examine relationships among acculturation, immigration, acculturative stress, self-reported as well as biological markers (maternal salivary cortisol levels) of psychosocial stress and birth outcomes in pregnant MA women. Design: Integrative literature review  Methods: The Whittemore and Knafl’s methodology guided this integrative review. The electronic academic database of PubMed was searched using keywords (appearing in title) accultura*, immigra*, stress and Mexican, for full-text, peer-reviewed, quantitative papers published in English until October 2018. This review is limited to studies with pregnant MA women. An initial 217 papers were retrieved and 210 were excluded upon abstract/paper review resulting in a total of seven articles. Results: Two studies demonstrated a positive relationship of acculturative stress with high levels of anxiety symptoms and depressive symptoms during pregnancy. Two studies showed that pregnant MA Mexico born women had higher levels of pregnancy related anxiety than pregnant MA U.S. born women. One study demonstrated that greater levels of acculturation was associated with a flatter diurnal maternal salivary cortisol slope during pregnancy and earlier gestational age at birth. One additional study concluded that acculturation was a direct predictor of preterm birth (PTB) and predicted the rise in salivary cortisol during pregnancy. One study showed that less acculturated MA women had a lower risk for PTB.
Conclusions: There is evidence that acculturation/immigration and acculturative stress have a negative impact on maternal mental health as well as a negative impact on perinatal outcomes. More research is needed on the impact of immigration/acculturation and acculturative stress on the health of pregnant Mexican American women.

172. Lung, Tyler; Geraghty, Joseph; Tate, Alex; Katz, Eitan and Testai, Fernando

The influence of early inflammation after subarachnoid hemorrhage in developing delayed vascular dysfunction.

*Undergraduate - Neurology and Rehabilitation*

Subarachnoid hemorrhage (SAH) is caused by a ruptured cerebral aneurysm, and this results in a bleeding in the subarachnoid space. Vascular dysfunction is frequent after SAH as early as 3 days after aneurysm rupture. Transcranial Doppler Ultrasonography (TCD) is utilized as a noninvasive apparatus to monitor brain activity. TCD is routinely used to detect large-vessel vasospasm and distal vascular resistance as a cause by SAH. One of the challenges in treating SAH is that we have little to no predictors of which patients may go on to develop vascular dysfunction. I hypothesize that SAH patients who exhibit a higher degree of early inflammation will have an increased likelihood of developing delayed vascular dysfunction. I conducted a retrospective chart review of SAH patients. White blood cell (WBC) counts in the serum and CSF were obtained from admission to day 5. TCD parameters included mean flow velocity and Lindegaard ratio which can detect vasospasm, as well as pulsatility which can detect increased vascular resistance. WBC data for days 0-2 were compared to TCD data from days 3-5.

We analyzed WBC and TCD data from 170 SAH patients. Female patients represented 64.5% of the study. Means of baseline prognosis scores are: Baseline Fisher 3.08, Baseline Hunt-Hess 2.84, Baseline GCS 11.68. Mononuclear cells in the CSF correlated with PI at day 1 (R2= 0.524 p=0.011) and day 3 (R2= 0.877 p<0.0001). Total CSF leukocytes on day 3 also showed modest correlation to elevated LR on day 5 (R2=0.3683, p=0.0164). There is a clear relationship between elevated levels of WBC on days 0-2 and vascular dysfunction from day 3 onward. These results help increase our understanding of the complex interactions between the immune and vascular systems after brain injury and how early immune changes may help predict vascular dysfunction before delayed brain injury fully develops.
173. Luo, Zhaowen

Differently Illustrated 3d Interactive Program for Radiological Education Regarding Prostate Cancer

Graduate / Professional - Biomedical Visualization

Prostate cancer is one of the most common cancers in the United States. However, using multiparametric magnetic resonance imaging (mp-MRI) to diagnose prostate cancer can be very challenging for inexperienced radiologists. There is a great need for effective radiology education since MRI is increasingly being used in assisting the diagnosis of various kinds of diseases. This study will develop a web-based 3D interactive program combined with 3D models, MRI data, and illustrated components to teach radiologists about the mp-MRI approach in diagnosing prostate cancer. This research could potentially support the compensating and enhancer theories of spatial understanding if the 3D interactive program helps learners with various level of spatial abilities to learn better. This research study will explore better ways to present 3D interactive programs and test the effectiveness of illustrative visualization which could result in better ways to visualize 3D data sets for educational purposes.

174. Lyons, Frankee

“From the Nation to its Fighters and Martyrs:” Commemoration of Jewish Wartime Suffering during the Polish Thaw

Graduate / Professional - History

In the mid-late 1950s in Poland, destalinization and the Thaw led to a brief moment of liberalization that included more open discussion of antisemitism in the popular press and the re-conceptualization and re-centering of Polish nationhood and polskość (Polishness) in socio-political discourse. My presentation examines how Jewish wartime suffering was commemorated during this period at three major anniversaries and commemorative events. These events include the tenth anniversary of Auschwitz-Birkenau’s liberation in 1955, the 1955 World Festival of Youth and Students, and the fifteenth anniversary of the Warsaw Ghetto Uprising in 1958. These events show that the Thaw’s moment of limited liberalization provided some Jews the possibility for inclusion in Polish society in the mid 1950s. By the end of the 1950s antisemitism and national divisions resurged in Poland’s post-stalinist political landscape, leading around half of Poland’s remaining Jewish population to emigrate during the so-called “Gomulka aliyah” from 1956-60.

175. Maffei, Dorothy
A Sociocultural Examination of How Gender and Stigma Impact Adolescent Eating Disorder Diagnosis

Undergraduate - Public Health

Scantily clad women on magazine covers and images of Michelangelo-esque superheroes with rippling muscles influence our ideals of what is beautiful, and acceptable, and highly influences adolescents. Behaviors established during adolescence may become contributors to long-term health problems as adults, and this is particularly true of eating disorders. Anorexia has increased by 36% every five years since the 1950’s, with 95% of those with eating disorders between the ages of 12 and 25. Female diagnoses are partly contributed to the cultural pressures to conform to ideals of body size, shape, and weight. The pressure to conform for females is often examined in the literature, while this pressure is underestimated for males and is reflected in the disparity of eating disorder diagnosis. Males suffering from eating disorders and body image issues have a vast stigma to overcome and, consequently, have been significantly neglected in both diagnoses and treatment. A literature of the correlation between sexual abuse and eating disorders revealed that approximately 30% of eating disordered patients had a history of sexual abuse. For males, sexual abuse is likely underreported due to a disproportionate amount of shame and stigmatization that accompanies abuse for men versus women. In addition, compensatory behaviors such as exercise are also used more by men than women. Appearance is no longer a primarily female concern. Sociocultural emphasis on the ideal male body is growing. Widespread cultural construction of eating disorders as a “woman’s illness” may result in men failing to seek treatment for eating disorders. This gender bias might be reinforced by clinical guidelines listing “female sex” as a leading risk factor for developing eating disorders in adolescence. It is vital for additional research on this disparity to ensure that barriers to help seeking, such as ignorance, stigma, and female-centric services, are addressed.

176. Maldonado Weng, Juan; Parikh, Ishita; Naqib, Ankur; Green, Stefan J.; Estus, Steven and LaDu, Mary Jo

The Effects of Sex and APOE Genotype on the Gut Microbiome in EFAD Transgenic Mice.

Graduate / Professional - Anatomy Cell Biology

While the gut microbiome (GM), the collective genome of gastrointestinal bacteria, is primarily studied in metabolism and immune defense, the GM may also serve as a therapeutic target in Alzheimer’s disease (AD). Although the GM of individuals with AD exhibit specific differences compared to healthy controls, the effect of AD risk factors on the GM is poorly understood. While age is the greatest risk factor,
APOE4 is the greatest genetic risk factor for AD, increasing risk up to 15-fold compared to APOE3, the common genotype. Among APOE4 carriers, females, compared to males, have an increased risk for AD and greater rate of cognitive loss. Thus, a greater understanding of how age, APOE genotype and sex alter the GM in AD will allow us to determine the role of the GM in AD pathogenesis. To study the interactions among these AD risk factors, we developed the EFAD-transgenic (Tg) mice, which develop AD-like pathology and express the human-APOE genotypes (E3FAD, E4FAD). Our hypothesis is that APOE genotype and sex interact to modulate the GM composition during AD pathogenesis in EFAD mice. Fecal samples from 4-month (M) EFAD mice were sequenced and compared, revealing that the GM composition is affected by both APOE and sex, across different taxonomic levels (Operational Taxonomic Unit (OTU), Genus, and Family level). Additionally, there is a significant effect for ♂E4FAD vs ♀E4FAD, though only at OTU level. Therefore, the synergistic effect of APOE4 and female sex on AD risk is exhibited by the GM. Further, heatmap analysis demonstrates clustering of ♀E4FAD samples based on 29 OTUs. This study will help define composition of the GM as a function of AD progression, as modulated by APOE genotype and sex. As well, this is a critical step in establishing the GM as a potential therapeutic target for AD.

177. Markovic, Milos

Liquid-Liquid Equilibria of the Ternary System Water + Glacial Acetic Acid + Mineral Oil

Undergraduate - Chemical Engineering

This research prepares equilibrium data for the tertiary system of Glacial Acetic Acid + Mineral Oil + Water. This system's equilibria are useful for UIC's ChE senior lab class where and extraction procedure of water to remove acid from oil is used. The process of extraction is a vital one in the chemical industry for removing impurities of different compounds. The key to determine the effectiveness and time needed for the purification to purify is equilibrium data. Laboratory experiments performed determined the equilibrium data and were plotted along a ternary diagram with binomial tie-lines. The volume relative volumes for each compound were determined, measured, and mixed. After separation, the amount of acetic acid that remained in each phase was measured with titration. It was vital to the experiments results that the temperature and pressure remained as unchanged as possible to avoid altering the data. The resulting data was collection in an excel document and the error for each measurement reported as well. Along the way, I realized there was some equilibrium data points that were not possible to determine experimentally, and I developed a program using Microsoft excel along with VBA programming to accept an input of a hypothetical mixture and output the
hypothetical equilibrium data that would result from such an experiment along with the error. It is shown that this program can compute hypothetical tie-lines with a reasonable error range using the current determined equilibrium data.

178. Martino, Joseph and Paternaski, Joseph

The effect of temperature on the efficiency of CO2 snow cleaning of fingerprint contaminants

Undergraduate - Earth and Environmental Sciences

Cleaning with a CO2-snow jet has been demonstrated to be an effective method to remove particulate debris and organic contaminants from flat silicone surfaces. CO2-snow cleaning’s effectiveness for rough rock surfaces is unknown but is of importance to avoid contamination when analyzing rocks by femtosecond laser desorption postionization-time of flight mass spectrometry (LDPI-TOF MS). This study would quantify the extractable molecular component of fingermarks on rock surfaces before and after CO2-snow cleaning. Samples of shale, polished shale, and glass slides would be tested to identify the effect of surface roughness on CO2-snow cleaning effectiveness. To quantify the extractable molecular components, fingermarks were deposited on the surface of rocks, polished rocks, and glass slides. Experimental variables that would be tested during CO2-snow cleaning include drying the fingermark under an N2 stream and heating under a heat lamp, using both, or none. After one hour of treatment in the specified condition, the samples were CO2-snow cleaned. The CO2-snow cleaned residue was then extracted and analyzed by gas chromatography-mass spectrometry (GC-MS). Compounds present were identified with mass spectrometry and quantified by comparison to a standard of known concentration. Results show that CO2 cleaning for glass slides was mostly effective (97%-100%). Shale rock samples without heat treatment or N2 treatment were not effectively cleaned. When heating and N2 gas streams were applied to rock slides, they had a large positive effect on CO2 cleaning efficiency.

179. Mason, Rachel; Hughes, Ashley M.; Sonesh, Shirley C.; Gregory, Megan E.; Salas, Eduardo; Marttos, Antonio and Schulman, Carl;

Trauma, teams and telemedicine: Evaluating telemedicine and teamwork in a mass casualty simulation

Graduate / Professional - Epidemiology and Biostatistics

Introduction: Mass casualty events (MASCAL), including natural disasters, are on the rise globally. While natural disasters are often unavoidable, the preparation to respond to unique patient demands in MASCAL can be improved. Utilizing
telemedicine can allow for a better response to such disasters by providing access to a virtual team member with necessary specialized expertise. The purpose of this study was to examine the positive and/or negative impacts of telemedicine on teamwork in teams responding to MASCAL events. Method: We introduced a telemedical device (DiMobile Care) to Forward Surgical Teams (FSTs) during a MASCAL simulated training event. We assessed the device for impact on teamwork-related affect, behaviors, and cognitions (ABCs) during the MASCAL scenario through pre-post surveys and observations of use. We calculated descriptive statistics and paired t-tests to determine significant pre-post differences. Results: We received 92 responses to our survey, with 52 completed and matched pre and post survey(s). Results reveal that overall clinicians will have positive reactions towards the potential benefits of telemedicine and on average, participants experienced significantly greater psychological safety after training. However, there was no improvement to behavioral and cognitive based teamwork. Nonetheless, participants reported perceiving that telemedicine improved leadership and adaptive care plans. There was no significant detriment to teamwork due to introduction of the telemedical device, as consistent with prior research. Conclusions: Telemedicine shows promise in connecting FSTs with nuanced surgical expertise without harming quality of care metrics (i.e., teamwork). However, we advise future iterations of DiMobile Care and other telemedical devices to consider contextual features of information flow to ensure favorable use by teams in time intensive, high stakes environments, such as MASCAL.

180. McNally, Thomas; Ana, Valencia-Olvera; Balu, Deebika; Faulk, Naomi; Saleh, Yaseen; Hansen, Allison; Pham, Don; Allababidi, Nur; York, Jason; Bielicki, John; Johansson, Jan and LaDu, Mary Jo

**ABCA1 activation in the CNS as a therapeutic target for APOE4-induced Alzheimer's disease risk**

*Undergraduate - Anatomy and Cell Biology*

APOE4, which encodes the apolipoprotein E4, (apoE) is the greatest genetic risk factor for Alzheimer’s disease (AD), increasing risk up to 15-fold compared to APOE3. However, there is a critical lack of therapeutics targeting mechanistic pathways for this APOE4-induced AD risk. While the mechanism underlying APOE-modulated AD risk remains unclear, APOE4 is associated with accelerated amyloid-beta (Ab) accumulation, both as amyloid plaque and soluble oligomeric forms of Ab (oAb), the latter considered a proximal neurotoxin. In addition, apoE4 levels in the brains of humans, and transgenic mice (Tg) expressing human APOE, are lower than apoE3. Thus, our therapeutic target for APOE4 carriers is increasing apoE levels and decreasing Ab levels. We used the EFAD-Tg mice, which specifically overexpress Ab42 and express human APOE4 (E4FAD) or
human APOE3 (E3FAD). ABCA1 is the major transporter of lipid to apoE-containing lipoproteins in the CNS. Thus, ABCA1 is a promising therapeutic target for increasing apoE levels by increasing its stability via an increase in lipidation. Artery Therapeutics, Inc. developed novel ABCA1 agonists, including CS6253 (Cs), for the treatment of peripheral cardiovascular disease. Cs demonstrates high selectivity and potency for ABCA1-mediated cholesterol efflux in a process where ABCA1 protein is stabilized. Both male and female E4FAD and E3FAD mice were treated with Cs using a prevention (4-8 months) paradigm. To establish dose, an in-vitro screen and PK analysis was done. In vitro, Cs increased apoE levels by 10-20-fold and the lipoprotein cholesterol efflux capacity in primary astrocytes expressing apoE3 or apoE4. In-vivo, Cs is brain penetrant, reaching higher concentrations than that needed for in vitro efficacy. Cs increased ABCA1 levels and reduced both soluble and insoluble Ab as well as amyloid deposition in brains of male E3FAD and E4FAD mice. In male E3FAD mice, Cs increased learning in Morris Water Maze, synaptic viability, and reduced Ab deposition and astrogliosis. There were no significant effects in female E3FAD or E4FAD mice except for an increase in ABCA1 levels. In summary, activation of ABCA1 by Cs was effective in male EFAD mice (E3FAD > E4FAD) in preventing synaptic loss, neuroinflammation, Ab deposition, and reduction in soluble Ab levels. Further investigation is needed to understand the mechanisms underlying sex differences with regard to ABCA1 activators, and to design optimal treatment paradigms for Cs-based ABCA1 agonism as a therapeutic for AD.

181. Mehta, Smruti

**SNOMED-CT nurses and physicians have little overlap in terms**

*Undergraduate - Biological Science*

Objective: To measure the discontinuity within the interdisciplinary documentation of hospital staff within the Electronic Health Record. Background: Many times, people assume that all health providers interact using the same terminology. This study shows the discrepancies between nurses and physician when talking about the patients. Methods: The functionality of this study was to show the differences between words nurses use to describe a care versus what a physician uses. 10 Heart failure patient discharge summaries were gathered to be analyzed and transformed to SNOMED-CT using Natural Language Processing program MedLEE. Nursing documentation was coded in NANDA-I, NOC, and NIC in HANDS© and then translated to SNOMED-CT. All translations were done through the Unified Medical Language System (UMLS). Physician and nurse SNOMED-CT terms were labeled by provider. Using the SNOMED-CT relationships, they were graphed using Cytoscape 3.6.1 to see if physicians and nurses use the same and related terms.
Results: The results from 10 patients have shown only two SNOMED-CT terms (pain and cardiology procedures) with overlap within two nodes between the professions, out of over 300 terms. Discussion: Physicians and nurses used different terms to record the care on the same patient and most provider terms were in completely different areas of the SNOMED-CT hierarchy. This study was performed in hopes to find common terms between nurses and physicians and in the future improve interdisciplinary care. Implications: This study shows how physician and nurses can treat the same patient, but end up coming with different terms to explain their care. While continuing with this study, we hope to create a better understanding between physician and nurse’s documentation. There are 48 more patients that will be evaluated for term similarities between doctors and nurses with an additional 1000 arriving in a short period of time.

182. Mehta, Yash and Aldrich, Leslie

**Microwave assisted benzofuran and benzopyran synthesis with chalcones**

*Undergraduate - Chemistry*

Diversity-oriented synthesis has historically focused on the creation of chemically diverse small-molecule libraries. Recently, there has been much interest in developing libraries that also have diverse biological properties. To assess which chemical features predict biological activity diversity, our group has developed libraries of natural product-like molecules through systematic variation of appendages, scaffolds, stereochemistry, and chemical properties. The series of reactions to access the aminoflavanol series begins with an aldol condensation, followed by an asymmetric Corey-Bakshi-Sibata reduction of the carbonyl to an alcohol. Next, a Sharpless asymmetric epoxidation is performed with the alkene and then a one-pot, epoxide-opening and subsequent intramolecular nucleophilic aromatic substitution forms the benzofuran core scaffold. The outcome can be altered with the addition of protecting groups to access the benzopyran core scaffold. Additional reactions can be performed after the cyclization reaction to incorporate various appendages. The future goal for this project is to test for biological activity diversity of these molecules through cell morphology and cytotoxicity profiling.

183. Mei, Sarah

**Evaluation of the effect of alternating pressure overlay on skin blood flow and tissue oxygenation: implication for pressure ulcer prevention**
Objective: To examine the mechanism of an alternating pressure (AP) overlay in comparison to a regular operation room (OR) overlay for pressure ulcer prevention on weight bearing tissue of people with chronic spinal cord injury (SCI). The central hypothesis is that the AP overlay will reduce the amount of interface pressure at the heel as it will allow for greater skin blood flow (SBF) in comparison to the regular OR overlay.

Methods: Fifteen adults (age 41.87±14.89 years old) with SCI were recruited (4 females, 11 males). The participants have injury level at T10 and above for more than one year. This study is a repeated measures design. Each subject underwent two protocols: lying supine on AP overlay for 40 minutes and lying supine on OR overlay for 40 minutes. During the AP overlay protocol, four 10-minute cycles (5 minutes inflation/deflation) will be used. Interface pressure and SBF were collected at the left heel using the pressure mapping system and laser Doppler flowmetry respectively during supine lying. Paired t-test and repeated measures ANOVA were computed to compare the difference in interface pressure and SBF between the two conditions at the heel.

Results: Interface pressure at the heel on the AP overlay, specifically during the deflation cycle, (14.6±2.16 mmHg) was significantly lower than on the OR overlay (34.93±4.29 mmHg), in which the p-value=0.003. Whereas the SBF at the heel on the AP overlay during the deflation cycle (27.92±8.30 au) was significantly higher than on the OR overlay (10.43±11.16 au), in which the p-value=0.000.

Conclusion: Alternating pressure may be used as a pressure ulcer prevention method for long-term weight bearing at the heel area. Further investigation of its effectiveness at different body sites is warranted.

184. Mikulecky, Ann

Mapping the Food Environment on the University of Illinois at Chicago Campus: The Relation Between Snack Choice and Housing Status

Undergraduate - Communication

This paper aims to determine whether there is a link between University of Illinois at Chicago (UIC) students’ housing status and their snacking behaviors. I will observe the snack environment on the UIC East campus by photographing and logging the contents of each snack vending machine on the East Campus, as well as the nutritional information for each item in such machines. I will code each item as healthy or unhealthy and rate the healthiness of each snack machine. I will gather subjects through an online survey, where I will ask whether they live on-campus, off-campus, or commute. I will randomly select students from this survey
and observe their snacking behaviors and snack preferences. I will use this data to
develop a possible correlation between housing status and snack consumption. Other studies that have investigated similar connections have determined correlations between dietary behaviors and many different socio-demographic characteristics such as age, gender, and economic status, so it is reasonable to expect a correlation between UIC students’ housing status and their snacking behaviors. Keywords: snacks, healthy, unhealthy, college housing, food environment

185. Miller, Richard; Parekh, Pooja; Luna, G.; Kim, M.; and Gerber, B. and Stiehl, E.

Focus Group of Nursing Home Nurses to Evaluate Nurse-Physician Communication and Decision Making Involved in Hospitalizations

Graduate / Professional - Geriatrics

Background: Preventable nursing home (NH) resident hospitalization rates vary from 11-70%, contributing to Medicare and Medicaid expenses of over $3 trillion annually. Knowledge, training, and availability of NH staff influence hospitalization decisions, but there has been limited attention given to the complex interactions among NH staff in the hospitalization decision-making process. The purpose of this study was to understand the role of nurses and the challenges they face in this process. Methods:Nine nurses at a NH in Chicago participated in a 60-minute on-site focus group. A facilitator asked questions regarding nursing routine, sources of hospitalization decisions, emotions, and suggestions on future training. The focus group discussion was recorded, transcribed, coded, and analyzed using thematic analysis. Results:Three themes emerged from the focus group. First, there was uncertainty and differentiation between routine versus non-routine aspects of resident hospitalizations. Emergency circumstances (e.g., significant respiratory issues) clearly required residents to be hospitalized; whereas in less clear situations, nurses used SBAR (Situation, Background, Assessment, Recommendation), consulted colleagues to assess residents, and communicated with physicians. Second, physicians ultimately decided whether to hospitalize residents, even though nurses were responsible for recognizing resident changes in health (as the physicians’ “eyes and ears”). The nurses expressed a variety of emotions around physician interactions, from anger and frustration to relief. These emotions were compounded by extra paperwork with readmissions. Third, there were challenges with hospitalization decision-making, including a lack of equipment, time, and staffing. The nurses recommended training including discussions of actual hospitalization cases and role playing, to build decision-making self-efficacy. Conclusions: NH nurses addressed the routine, physician communication, and various challenges involved in hospitalization decision making of residents. Future work on unnecessary hospitalizations should address the
ambiguity around residents’ conditions and nurse-physician interactions. Nurse training and other interventions could emphasize tools (SBAR) and include role playing to improve nurse-physician communication.

186. Mohammed, Hadi

‘Thirst’ neurons of the subfornical organ recruit the mesolimbic system via multi-order pathways.

Undergraduate - Psychology

Animals need to maintain tight control over their internal state (e.g. calorie availability, temperature) in order to survive. Deviations from optimal conditions motivate behavior to take corrective action. This is strikingly apparent with body fluid composition where an increase in plasma osmolality causes thirst and the seeking and drinking of water. However, the flow of information from brain centers that detect deviations in body fluid homeostasis to regions critical for motivated behavior remain unknown. Here, we investigate a novel hypothesis that the subfornical organ (SFO), a critical brain region for the detection of changes from body fluid homeostasis, motivates behavior through the recruitment of the mesolimbic (e.g. ventral tegmental area and nucleus accumbens) system. We delivered a virus containing a vector promoted by the CaMKIIa gene to express excitatory designer receptors exclusively activated by designer drug (DREADD) in glutamatergic ‘thirst’ neurons of the SFO (SFOglu) and an injection cannula in the lateral ventricle of rats. After recovery from surgery, rats were injected with either saline (no physiological consequence) or clozapine-n-oxide (CNO) – which activates DREADD but is otherwise inert. Previous work from our lab has shown that CNO but not saline injection is sufficient to generate thirst in similarly prepared rats. Following injections, rats were sacrificed and their brains were assayed for the presence of the immediate early gene cFos as an indicator of neural recruitment. CNO, relative to saline control, caused a significant elevation in cFos in the ventral tegmental area and the nucleus accumbens. We also found a significant elevation in the lateral hypothalamus. Thus, activation of thirst-driving neurons of the SFO recruit mesolimbic circuitry that is critical for motivated behavior. Since the SFO does not send direct projections to the ventral tegmental area, the lateral hypothalamus represents a potential relay point in the recruitment of motivation by thirst.

187. Molina, Stephanie
Examining Self-Reported versus Other-Assigned Skin Tone Perceptions

Undergraduate - Sociology

The purpose of this study was to see how people perceive skin tone differently. For this study, forty-six students were recruited from the University of Illinois at Chicago, a racial-ethnically diverse urban Research I university. Students were recruited to have varying skin tone after completing a screener survey that asked them to rank their skin tone in one of 66 categories of the L’oreal color chart. During their visit, students were also asked to rate their own skin tone and the skin tone of 80 randomly assigned facial photos stratified by gender and race-ethnicity on two additional widely-used color scales, Massey-Martin, and PERLA palette. Two interviewers also rated the participants’ skin tone using these same color scales. We will examine two research questions. First, will respondent's with darker skin tone (as reported on the screener) perceive the pictures as lighter than respondents with lighter skin tone? We examine this question in two ways, once with the absolute ratings of each photo and second using the difference between the students self-rating and their rating of the photos on each of the two scales. Second, will interviewers’ perception of the respondent's skin tone be darker than the respondent's self-perception of their skin tone?

188. Montes, Marcus and Madhavan, Sangeetha

Apolipoprotein E and Stroke Recovery

Undergraduate - Kinesiology

Stroke is the leading cause of long-term disability in the United States. Stroke often leads to physical impairments that hinder an individual's life. These impairments affect their strength, balance, walking, and overall function. Rehabilitation following a stroke is critical for a person's recovery. However, rehabilitation for stroke has generally not been individualized for the person receiving the treatment. To understand how to individualize rehabilitation more, genetic factors are being researched. One of these genetic factors is apolipoprotein E (ApoE). This study recruited 38 chronic stroke survivors who were divided into two groups based on their ApoE type. Participants did tests to determine functional outcomes including gait speeds, balance, and strength. Between the two groups, no significance differences were observed. The results suggest that ApoE is not a significant gene in functional recovery following a stroke. Further studies can be conducted to determine other genetic variations to determine how to better individualize rehabilitation for stroke survivors.
189. Mourad, Talal; Loukenas, Efstathia; Weng, Juan Maldonado; Valencia-Olvera, Ana; Balu, Deebika; York, Jason M. and Ladu, Mary Jo

**AD Symptomatic Profiles that Predict the Dominance of Sex or APOE Genotype in EFAD Mice**

*Undergraduate - Anatomy and Cell Biology*

While age is the greatest risk factor for Alzheimer’s disease (AD), *APOE4* is the greatest genetic risk factor for AD compared to the common *APOE3*, an effect exacerbated in female (♀) *APOE4* carriers. In the brain, levels of apoE4 are lower than apoE3, likely the result of instability as apoE4 is poorly lipidated. AD is caused by the accumulation of amyloid-β (Aβ) peptide, which aggregates to form both amyloid plaques and soluble oligomeric Aβ (oAβ), the latter considered a proximal neurotoxin. In the EFAD mouse model (expresses human *APOE* and overexpresses Aβ42), AD pathology includes cognitive impairments, amyloid deposition, neuroinflammation, neuronal loss, reduced lipidation of apoE4, and increased soluble Aβ42 and oAβ. Pathology develops: ♀E4FAD > ♂E4FAD ≥ ♀E3FAD > ♂E3FAD, and is exacerbated with age (4-18 months/M). However, when attempting to compare ♀E3FAD and ♂E4FAD carriers the results are inconclusive. If ♀E3FAD exhibit greater AD pathology than ♂E4FAD, then sex would be a dominant risk factor. If ♂E4FAD males exhibit greater AD pathology than ♀E3FAD, then APOE genotype would be the dominant risk factor. Thus, we are evaluating all our readouts for AD pathology from 4-18M ♀ and ♂E3FAD and E4FAD mice using advanced biostatistics to identify whether the ♀sex effect dominates the *APOE4* effect on AD pathology or whether *APOE4* effect dominates the ♀sex effect. Since ♀E3FAD and ♂E4FAD share neither the same sex or genotype, they cannot be directly compared statistically, requiring 2 controls: 1) ♀E3FAD as negative control and 2) ♂E4FAD as a positive control. These data will leverage extensive research results to address how age, APOE genotype and sex interact to affect AD pathology in ♀E3FAD vs. ♂E4FAD, with the goal of defining symptomatic profiles that predict the dominance of sex or genotype between these 2 cohorts.

190. Moy, Michelle

**Development of Health Rehabilitation in Mainland China: From Traditional Chinese Medicine to Modern Rehabilitation Methods**

*Undergraduate - Rehabilitation Sciences*

The aim of this study is to understand the changes occurring in China, leading to the development of health rehabilitation. This study will portray the shift of
traditional Chinese medicine (TCM) to influences of modern rehabilitation and will also introduce the idea of an integrated model of TCM and modern rehabilitation. This project will present the different perspectives on China’s current development of rehabilitation from individuals in China, Hong Kong, Malaysia, and the United States. Observations were held at a TCM hospital, a rehabilitation hospital, as well as a TCM hospital that provided modern rehabilitation services. Two online surveys were sent out to rehabilitation health professionals working in mainland China, one of which collected quantitative data while the other collected both qualitative and quantitative data. 10 responses were collected in the quantitative survey while 21 responses were collected through the qualitative and quantitative survey. Two formal interviews were conducted with a massage therapist and TCM rehabilitation physician. Guided assistance and conversations also helped gain a useful background for this study. One online survey was conducted in Chicago, Illinois and collected information from University of Illinois at Chicago Applied Health Sciences (AHS) faculty as well as AHS graduate students in rehabilitation related fields. In conclusion, majority of respondents expressed that rehabilitation in mainland China is slowly developing, but is improving with the knowledge and influence from other countries and regions. In terms of cost and location, Western rehabilitation is inaccessible. However, traditional Chinese rehabilitation therapy is more affordable and available. The study presented that an integration of both TCM and modern rehabilitation is beneficial and effective.

191. Nacht, Carrie; Agingu, Walter; Otieno, Fredrick; Odhiambo, Finch and Mehta, Supriya D

The prevalence and types of antimicrobial resistance among STD clinic patients with Neisseria Gonorrhoeae in Kisumu, Kenya

Graduate / Professional - Epidemiology and Biostatistics

Background: Approximately 11.4 million new cases of gonorrhea appear in the WHO African Region annually, and global incidence of this sexually transmitted infection has been increasing; part of this increased incidence is likely due to antimicrobial resistance (AMR). We sought to determine the prevalence and types of AMR in male patients infected with Neisseria gonorrhoeae (NG).Methods: Urethral swab specimens were obtained from men presenting to a STD clinic with urethral discharge detected on clinical exam between January 28, 2018-June 30, 2018. Gonorrhea was confirmed by culturing on Thayer-Martin GC Culture selective media. Disk diffusion was used to measure resistance for penicillin, tetracycline, doxycycline, ceftriaxone, ciprofloxacin, azithromycin, erythromycin, and gentamicin. Results: Of the 226 males who visited the clinic during the study period, 157 (69.5%) were diagnosed with urethritis. In 60 men, urethral swabs samples were taken and 35 (58%) were culture positive. Interpretation of the disk
diffusion results showed high resistance in penicillin (97%), tetracycline (100%), ciprofloxacin (20% resistance, 71% intermediate resistance), doxycycline (91%), and there was high susceptibility in ceftriaxone (100%) and azithromycin (100%).

Conclusions: We observed high rates of resistance to several drug classes, likely driven by background selective pressure, as resistance was not observed among currently recommended Kenyan therapies. Expanded surveillance for AMR in NG and other pathogens of importance is warranted. Agar dilution or Etest reference testing is needed for accurate assessment of resistance and susceptibility, especially in azithromycin and gentamicin.

192. Nagorski, Kate

The Contemporary Marriage: An Analysis of "A Doll's House, Part 2"

Undergraduate - Theatre

Lucas Hnath’s 2017 play, A Doll’s House, Part 2, examines marriage and divorce while writing in an anachronistic, or historically inaccurate, way. This presentation looks at two analyses of Hnath’s play: a textual analysis of the script and a production analysis of Steppenwolf Theatre’s 2019 production. The textual analysis consists of an examination of the plot, the characters, and themes present throughout the play. A plot line, consisting of events that move the story forward written in active language, or wording that can be acted out on stage, was created; a play inventory, highlighting the themes present as well as references researched, was arranged; and character motives were examined. Through this textual analysis, the themes of modern marriage and marital progress were highlighted. These themes raised the questions of "Can Lucas Hnath’s A Doll’s House, Part 2, be considered commentary on modern marriage while not including same-sex marriage? How does excluding same-sex marriage impact the play’s contemporary connection to marriage?" All of this analysis was compared to Steppenwolf’s staging and discussed in an essay, in which reviews of the Steppenwolf production and interviews with the playwright were taken into consideration. The information presented offers a specific point of view on the topic of marriage and commentary on its current presence in society.

193. Withdrawal

194. Nayyar, Maimuna
Exercise and Its Effects on Anxiety

Undergraduate - Honors College

Anxiety is a common mental disorder that varies in symptoms and can have detrimental effects on many individuals. The disorders categorized under anxiety are general anxiety disorder, obsessive compulsive disorder, posttraumatic stress disorder, social anxiety disorder and specific phobia. In order to reduce the symptoms of anxiety and cause prevention, physical activity and exercise interventions proved to be successful. Staying active and engaging in exercise positively impacts one’s health in many ways and serves as a protective effect against chronic diseases and mental disorders. Regular physical activity is also associated with positive moods and reduced stress. In particular, physical activity has a negative correlation with anxiety and alters biological and psychological mechanisms in several ways. Many biological and physiological mechanisms are altered with exercise such as changes in the HPA system, monoamine system, neurogenesis, brain-derived neurotrophic factor, inflammation, oxidative and nitrogen stress (Moylan). Psychological mechanisms also account for reduced anxiety with physical activity as anxiety sensitivity is introduced, self-efficacy is increased, and various forms of stress are reduced (Anderson, Shivakumar). Exposure to the general physiological sensations of aerobic exercise also serves to reduced anxiety. Many studies and interventions conclude the fact that regular physical activity and exercise have anxiolytic effects through several mechanisms and can serve as an alternative form of therapy. All in all, exercise serves as a prevention strategy to anxiety and can also reduce symptoms of it.

195. Newell-Sansom, Drew

The Reasons Black Children do not Receive Mental Health Help

Undergraduate - Biology

This literature review will be looking into the causes for why Black parents do not allow their children. The start of the literature review will outline the parameters such as the different types of mental illnesses and their symptoms as seen in the DSM-V. The literature review will continue with understanding the different reasons of why Black parents do no allow their children to receive mental health help. The literature review will finish with a look into the societal reasons for this distrust of Black parents and mental health doctors.
196. **Nguyen, Austin; Loukenas, Efstathia; Allababidi, Nur; Balu, Deebika; Hansen, Allison; Valencia-Olvera, Ana; York, Jason; Peri, Francesco; Neumann, Frank; and LaDu, Mary Jo**

**Toll-like receptor-4 antagonism as a therapeutic for AD-associated neuroinflammation**

*Undergraduate - Anatomy and Cell Biology*

Alzheimer’s disease (AD) is the most common form of dementia with no cure and only palliative therapeutics. The rare familial form of AD (FAD) is caused by autosomal dominant mutations that increase the peptide amyloid-β (Aβ), which aggregates to form both amyloid plaques and soluble oligomeric forms (oAβ), the latter considered a proximal neurotoxin. *APOE4* is the greatest genetic risk factor for AD, compared to the common *APOE3* and the rare but protective *APOE2*. The mechanism underlying *APOE* modulation of AD risk remains unclear. Even less understood is the critical link between female sex and *APOE4*-induced AD risk. A common and early symptom of AD pathology is Aβ-induced neuroinflammation modulated by *APOE*. Importantly, oAβ-induced neuroinflammation is mediated by Toll-like receptor-4 (TLR4), a key component in the innate immune response. Our hypothesis is that blocking the TLR4 pathway will reduce AD pathology, particularly in female *APOE4* carriers. To test this hypothesis, we used the novel EFAD-Tg mice, which overexpress specifically Aβ42 and express *APOE4* (E4FAD) or *APOE3* (E3FAD). EFAD mice were treated with IAXO101 (IAXO) – a TLR4 inhibitor using prevention (4-6M) and reversal (6-7M) paradigms. There were no significant effects with the prevention paradigm. In the reversal paradigm, IAXO induced a significant increase in learning and memory, a decrease in soluble Aβ, and a reduction in amyloid deposition in the female E4FAD mice. In both male and female E4FAD mice, IAXO decreased microgliosis and IL-1β levels. The inhibition of the TLR4 pathway by IAXO101 affected selective readouts for both neuroinflammation and Aβ solubility, two components of AD-related pathology. Further investigation is needed to understand the use of TLR4 antagonists for AD therapeutics.

197. **Nhav, Saing Ang**

**The impact of mutual funds' size on their performance**

*Undergraduate - Finance*

Mutual funds are the alternative for investors to collectively and effortlessly invest in the stock market, commodities, currencies, and other investment securities. However, mutual funds come in different size and structure. Does the size (total net asset value) of any mutual funds has an impact on their performance? Do larger mutual funds perform better than smaller funds given their sizes? The role of size in actively-managed versus passively-managed funds will be examined.

198. **Nutalapati, Arunachala**
Imaging of Negatively Charged Gold Nanoparticles in Graphene Liquid Cells containing Purified Water

*Undergraduate - Physics*

The study of charged colloidal nanoparticles and their motion in aqueous solutions is important for further understanding of various phenomenon found in drug delivery to water treatment processes. To be able to mimic and image this phenomenon, we studied the interfacial interactions of negatively charged carboxylated gold nanoparticles (size ≤ 15nm) and their inhabitation inside Graphene Liquid Cells (GLCs) containing purified water. This was done with the end goal of achieving a free floating state for the gold nanoparticles inside the GLCs. With help from the UIC Nanoscale Physics Group, we established various concentrations through imaging by Transmission Electron Microscopy (TEM) in order to observe the interactions due to varying concentrations. We also imaged real time motion through the use of Scanning Transmission Electron Microscopy (STEM). We observed excessive aggregation of the gold nanoparticles (GNPs) at the edges of the carbon grid used for the TEM. Through trial and error we found the correct concentration in order to get a more uniform distribution. We also observed clustering of the nanoparticles in the GLCs. It was assumed to be due to the conducting properties of the encompassing graphene sheets. With the addition of NaCl dissolved in the aqueous solution, we saw some success in decreasing the clustering. Again, the TEM was used for the trial and error in establishing a concentration in which we saw a visible effect. In the end, we did observe a very moderate free floating state for the nanoparticles when in the GLC. The motion was ruled to not be due to any created hydrogen gas by overlong exposure of the electron beam from the STEM.

199. *Nwigwe, Lillian; Molina, Yamilé and Carnahan, Leslie*

**The Challenges of Recruiting Rural Black Women in Cancer Research**

*Undergraduate - Public Health*

Background: Cancer survivorship research is not evenly allocated in the United States, the intersections of race, gender and rurality. This is due to limited participation of rural African American female survivors. The current study focuses on identifying which strategies are feasible and optimal for recruiting rural African American women in cancer research. Methods: We examined three potential recruitment sources across time: the Illinois Cancer State Registry (10/17); community-based agencies (05/16-09/18); e.g., hospitals, non-profit organizations); and, commercial phone lists (04/18-09/18). We tracked how many
rural African American female survivors after each strategy was implemented. Results: Two of the 3 strategies were feasible: recruitment through community-based agencies and commercial phone lists. The cancer registry was not able to support study recruitment. We engaged 367 community-based agencies (36 government agencies, 84 health departments, 152 hospitals/clinics, 16 academic institutions, and 79 community/private sectors) and called 3,214 phone numbers, of which we successfully contacted a person 471 times. Six AAW participants enrolled when recruiting through community-based agencies only, and 4 AAW participants enrolled when we began to use commercial phone lists. Discussion: Our findings suggest there are barriers for researchers to recruit medically underserved groups. Cancer registries should be given resources to be able to work with researchers. Researchers should also partner with organizations that serve predominately African American with shared responsibilities for recruitment, who can conduct focus groups within those participatory niches in rural settings to facilitate this process.

200. Ochoa-Raya, Andrea; Pietruczyk, Elizabeth and Lutz, Sarah

Optimized tissue clarification for blood-brain barrier reconstruction in neuroinflammatory disease.

Undergraduate - Anatomy and Cell Biology

In multiple sclerosis, the blood-brain barrier (BBB) becomes compromised and effector T cells are able to cross into the central nervous system (CNS) and cause demyelination. The BBB is a selectively permeable physical barrier formed by CNS blood vessel endothelial cells. It becomes increasingly penetrable during neuroinflammatory diseases. Currently there are several ways of identifying the proteins involved in neuroinflammation, such as immunohistochemistry, but it may take months to image an entire organ section by section. Whole organ clearing is the ideal method for imaging entire structures because, with the use of lattice light sheet microscopy, one would be able to build a series of 3D images. The current method for doing this is expensive, difficult to implement, and requires a degasser. We sought to optimize a published mPACT organ clearing protocol to visualize BBB proteins in mice with the experimental autoimmune encephalomyelitis (EAE) model of multiple sclerosis. We optimized antibody combination and incubation times as well as fashioned a home-made apparatus for electrophoretic clearing of opaque proteins and then utilized epifluorescence microscopy to identify protein distribution in neuroinflammatory disease. We were able to construct a 3D image of neurovascular segments using widefield microscopy. Future studies will utilize this technique to assess regional anatomic distribution of BBB damage and T cell
infiltration in disease. This will further our research and allow us to make relevant discoveries regarding neurodegenerative disease.

201. Ogbuagu, Nicole; Krogh-Jespersen Sheila; Wakschlag Lauren S. and Petitclerc Amélie

Associations Between Mother-Partner Relationship Quality, Parenting, and Child’s Disruptive Behavior

Undergraduate - Neuroscience

Prior research linking couples’ relationship quality to parenting quality and their child’s outcomes has mostly been conducted with parents of children of preschool age and older. The purpose of this study was to test whether couples’ relationship quality is associated with lower child disruptive behavior as early as age 1 through its effect on parenting quality. Of 350 families involved in the When to Worry (W2W) Study, we focused on the 144 in which both mother and partner responded to questionnaires. Relationship quality was measured with the Perceived Relationship Quality Component. Child disruptive behavior was measured using the Multidimensional Assessment of Preschool Disruptive Behavior. The Parental Cognitions and Conduct Towards the Infant Scale measured parental self-efficacy and hostile-reactive parenting. Parental responsiveness and positive parenting practices were measured using the Maternal Infant Responsiveness Instrument and Parenting Practices Questionnaire, respectively. As expected, mothers’ perceptions of higher relationship quality were associated with lower child disruptive behavior as reported by herself (r = -0.17, p=0.047) and her partner (r = -0.19, p=0.030). Parenting quality mediated these relationships: the association between maternal report of relationship quality and child disruptive behavior (mother and partner reports averaged) was reduced from c=-0.11, p = 0.017 to c’=-0.07, p = 0.170 when maternal parenting quality was entered in the regression model, and to c’=-0.07, p =0.178 when her partner’s parenting quality was entered. However, contrary to hypotheses, partners’ perceptions of relationship quality were not associated with either mother- or partner-reported child disruptive behavior (p’s>.10). These results suggest different patterns for mothers and partners in how the perception of their couple’s relationship influences their parenting and their child’s disruptive behavior. They also suggest that relationship quality impacts child and family functioning as early as one year after childbirth.

202. Oke, Shariwa; Varady, Kristina; Mount, Kristin and Bond, Samantha
Creating an Interactive Aid to Mediate Obesity Diagnoses and Management Through Visualization

Graduate / Professional - Biomedical Visualization

The purpose of this research is to discover if an app was the best method of delivering nutrition and exercise facts and obesity information to a patient with obesity. This study also emphasized usability testing and prototype creation.

The study consisted of three phases: the research phase (pre-phase), prototype phase (Phase 1), and app phase (Phase 2). During the research phase, group discussions were held with four experts, chosen for their experience with an obese patient population. Questions about the patient population and desired functionality of the proposed app were discussed.

Feedback from the pre-phase informed decisions for Phase 1, where a paper prototype was developed for the app. Next, one-on-one interviews were held with the same group of experts. They were asked general questions about their patients and then given tasks to complete using the prototype. Comments about the intuitiveness and usability of the prototype were recorded.

In Phase 2, the app was developed in Unity2D, a gaming engine. Feedback from Phase 1 testing was implemented in design and functionality choices. Two patients total from the Cardiac Rehabilitation Center were recruited for the study. One received the app on their Android phone, to use for a week. The other received handouts with the same nutrition, exercise, and obesity information as the app included. All subjects were given a pre-test, including questions about their comfort levels with their health care provider, and knowledge surrounding exercise and nutrition, before they were given their treatment. A post-test was given one week after they had the opportunity to interact with their materials (app or handout).

Results from the pre- and post-test were not statistically evaluated, and therefore no conclusions can be drawn. However, the qualitative data from prototyping and iterative design testing is invaluable to improve such apps in the future.

203. Okoli, Deborah; Brady, Matthew; Hanlon, Erin; White, Jeremy; De Leon, Avelino; Piron, Matthew; Ross, Ruby and Casimiro, Isabel

“The Effects of Obesity and Bariatric Surgery on Protein Expression in Human Adipose Tissue”

Undergraduate - Psychology, Pre-medical studies

Obesity levels worldwide have skyrocketed in the past thirty years. Obesity is characterized by the accumulation of body fat, which has been shown to leave obese people at higher risk for serious health complications including diabetes.
The most effective treatment currently is bariatric surgery, which leads to a reduction in insulin resistance and diabetes risk. The focus of the study was to observe the effects on gene and protein regulation of adipose tissue in obese subjects post-bariatric surgery. The hypothesis is that bariatric surgery will induce gene expression changes in adipose tissue that are indicative of improvements in metabolic health. Adipose tissue was acquired through needle-biopsies in the clinical resource center on the human subjects pre- and post-surgery. A portion of the tissue sample was immediately frozen, while another portion was placed into media and cultured up to 48 hours. The media was collected throughout the protocol to measure protein secretion from the tissue. Potential changes in secreted protein expression from pre- to post-surgery were initially identified using a human adipose tissue adipokine array. The gene expression of proteins identified by the array was then measured by RT-qPCR. The sample size was three patients. Initial screening via the adipokine array of samples for proteins whose secretion levels in adipose tissue changed post-surgery indicated that the following proteins may be of interest: pentraxin, fibrinogen, macrophage migration inhibitory factor (MIF), cathepsin D, cathepsin L, and cathepsin S. The cathepsins have been reported to mediate immune cell inflammation in adipose tissue, while pentraxin, fibrinogen, and MIF have been identified as potential links between obesity and cardiovascular disease. The gene expression changes of cytokines IL-6 and TNF-α were also analyzed via RT-qPCR. The results showed that MIF, cathepsin L, cathepsin S, and IL-6 decreased in expression post-surgery, as hypothesized. However, pentraxin also decreased in expression post-surgery, while fibrinogen, cathepsin D, and TNF-α increased in expression, contrary to the hypothesis. All target genes showed a dynamic range of oscillation over a twenty-four-hour period. Additionally, the gene expression of each gene clearly changed in the three patients from pre- to post-surgery. A possible explanation for the unexpected change in expression of certain inflammation mediators post-surgery is that there may a different inflammatory profile, due to dead adipocyte clearance resulting from post-surgery weight loss. Overall, these results may further our understanding of the impact that bariatric surgery has on adipose tissue at the molecular level.

204. Olsen, Abigail and Browe, Brigitte

The Most Efficient Use of Medical Marijuana for Optimal Inflammatory Pain Relief

Undergraduate - Neurobiology, Biological Sciences

African naked mole rats live in underground tunnels with high CO2 levels. Because this is a very painful environment, these rodents have an adaptation that has removed all peptides, which would be activated by CO2, from the pain pathway.
However, naked mole rats have a fully functional inflammatory pain pathway using purinergic receptors. One treatment that has become popular is using cannabis to treat inflammatory pain, but the mechanism of this treatment is not fully understood. The formalin and von Frey tests were administered to study the effects of cannabinoids on inflammatory pain. Overall, cannabinoids were seen to reduce pain through the P2X3 pathway, and the pain attenuation profile for both short term and long term inflammation was acquired to determine if there was an optimal time difference in when cannabis should be used to decrease inflammatory pain.

205. Olson, Shelbi; Spaggiari, Mario; Tulla, Kiara; Di Cocco, Pierpaolo; Benedetti, Enrico and Tzvetanov, Ivo

Hepatic epithelioid hemangioendothelioma (HEH) as an indication for living donor liver transplantation

*Graduate / Professional - Transplant Surgery*

Background: Hepatic epithelioid hemangioendothelioma (HEH) is a rare malignant tumor of endothelial origin with varied disease course. At presentation, disease is often multifocal and bilobar with extrahepatic involvement. Chemotherapy and radiation have yielded variable results, but disease burden is best addressed with surgical intervention. Although surgical resection is viable for small volume tumors, transplant is a more favorable option for multifocal disease with diffuse involvement. Furthermore, extrahepatic disease is not a contraindication to transplant and does not impact survival. Case Presentation: We present a case of living donor liver transplant for biopsy-confirmed HEH with extrahepatic involvement in the lungs. A 37-year-old female initially hospitalized for pyelonephritis was found to have elevated liver transaminases that prompted further workup. Imaging revealed two liver lesions, as well as lung involvement. Biopsy of the liver lesions confirmed HEH. After treatment with radiofrequency ablation and bland embolization, repeat imaging showed more advanced disease and the decision was made to pursue transplantation. The patient was listed for transplant 12 months after initial diagnosis. Fortunately, a living donor was identified and a partial (right lobe) living donor liver transplant was completed 21 months after diagnosis of HEH, without intraoperative complications. Postoperative course was complicated by biliary leak and biliary stricture. Imaging at 5- and 6-months post-transplant was negative for signs of recurrent or metastatic disease and showed stable lung nodules. Discussion: Transplant is a favorable option for patients with HEH, with post-transplant survival rates of 80% and 64% at 1 and 5 years, respectively. Living donor transplantation provides an opportunity for earlier treatment for patients with HEH, minimizing time for disease progression associated with awaiting a deceased donor liver transplant.
**206. Orozco, Amanda Y.; Molla, Hanna; Miguelez Fernandez, Anabel M.M.; Caballero, Adriana and Tseng, Kuei Y.**

**Systemic administration of the Cannabinoid CB1 receptor agonist WIN during adolescence disrupts the maturation of trace fear extinction behavior**

*Undergraduate - Anatomy and Cell Biology*

During the transition from adolescence to adulthood, the prefrontal cortex (PFC) undergoes marked development accompanied by increased risk for developing psychiatric disorders which display prefrontal dysfunction. In preclinical studies, administration of synthetic cannabinoids during adolescence has been shown to disrupt the functional connectivity between the ventral hippocampus and PFC when tested in adulthood (Cass et al., Molecular Psychiatry 2014). Accordingly, a disruption of PFC-mediated extinction of trace fear memory emerged. What remains unknown is whether the effect of adolescent cannabinoid exposure on the PFC can be observed immediately or it is manifested only when reaching adulthood. To fill this gap in knowledge, i.p. injection of the synthetic CB1 receptor agonist WIN was delivered once daily for 5 days to adolescent (postnatal days P35-40) rats at 2 mg/kg. Behavioral assessment of ventral hippocampal-PFC function was determined using the trace fear conditioning and extinction paradigm at 24 hours or 10 days post-last injection of WIN or vehicle. Results show that the rate of extinction was significantly decreased in WIN-treated rats when compared to vehicle controls. Moreover, rats exposed to WIN had extinction rates equivalent to those observed in P30-35 juveniles. Collectively, the results show that exposure to CB1 receptor cannabinoids during adolescence is sufficient to elicit behavioral deficits which can be detected shortly after administration. However, the disruption endures and becomes more apparent in adulthood as ventral hippocampal-PFC functional connectivity is recruited to regulate behavior.

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**207. Oswald, Kathryn; Atteberry, Kimberly and Alfonso, Aixa**

**PHC abnormalities in hlh-3 adult males**

*Undergraduate - Biological Sciences*

The Alfonso lab studies the transcription factor hlh-3 and how that affects the nervous system in C. elegans. Expression of hlh-3 is necessary for the terminal differentiation of sex specific and sex shared neurons co-opted for specific sex function. My specific role in Dr. Alfonso’s lab is to study the effects that hlh-3 has on PHC neurons within adult males. Others have established that PHC is a sex shared neuron that have sexually dimorphic features. In hermaphrodites PHC neurons appear to be sensory neurons that form only a few synapses with other
neurons. Whereas in males, the PHC neurons form a lot more synapses in particular with the male-specific synaptic inputs. In addition to their sensory function, PHCs play a role in mating behaviors of adult males. Given what we know about hlh-3 and what others have shown regarding sexual dimorphism, I looked to determine if hlh-3 mutant adult males exhibited any defects in the PHCs. Typically, adult male C. elegans only have two PHC neurons in their tails; however, when performing fluorescent microscopy on hlh-3 mutant males, the presence of an additional cell body was observed. Although the fluorescent microscope showed that the axonal length of these mutants stayed relatively constant, confocal imaging showed that the pathfinding for the axons appeared abnormal in comparison to the wild type. Additionally, the reporter used to identify these neurons (eat-4) showed constant fluorescent intensities when comparing the mutants to the wild type. To further establish the effects that hlh-3 has on the sexual differentiation of the PHC neurons, a behavioral assay was performed on the mutant strain (tm1688). These adult males showed defects in mating behavior as they were unable to locate the vulva of a hermaphrodite or were uninterested in them.

208. Padilla, Marian; Ren, Jinhong, Lee, Hyun and E. Johnson, Michael

Hotspot motifs of NS5 in Zika Virus Reveals Future Perspectives for Drug Discovery

Undergraduate - Medicinal Chemistry and Pharmacognosy

The Zika Virus (ZIKV) belongs to the Flavivirus family transmitted by Aedes Agypti and Aedes albopictus mosquitoes in sub-tropical regions of the world. In 2015, the World Health Organization declared a state of emergency from the Zika outbreak, since it causes neurological defects such as microcephaly in newborns and Guillain-Barré syndrome in adults. Although infection rates have decreased since 2016, Zika virus still lingers in mosquitoes, which can cause an unpredictable outbreak in the future. Currently, there are no vaccinations for this disease. The RNA dependent RNA polymerase (RdRp) domain of Non-Structural Protein 5 (NS5) in ZIKV is a promising target for anti-viral drug development of ZIKV because of its significant contribution for virus replication. In this study, the structural properties of ZIKV NS5 were explored through computational solvent mapping approach to find the hotspots, which are pivotal for ligand binding. Moreover, the binding site properties from computational solvent mapping was also compared with that from Dengue Virus (DENV) NS5, which is another species in the Flavivirus family. DENV NS5 presented a vital co-crystal structure with an inhibitor, then the two polymerases were superimposed. The DENV NS5 and ZIKV NS5 revealed a high rate of similarity in the conservation of active site conformations but exhibited differences in bonding interactions. The essential
properties from analyzing the binding site of ZIKV NS5 will benefit the future structural based virtual screening to find potential small molecule inhibitors.

209. Pai, Anusha and Laudando, Alessandra

**Crime Notifier App**

*Undergraduate - Computer Science*

Chicago, like any major city, consists of neighborhoods with varying levels of crimes. The Crime Notifier App is an Android app that notifies users if they are going into or is in an area of high/high-medium crime rates based on public data. We identify a classification scheme for levels of crime rates in the city. For example, we came up with thresholds for high, high-medium, medium, medium-low, and low levels of crime rates. To determine the thresholds, we analyzed crimes in terms of category, location, and time of day. We then used this data to create a heat map with these classifications. The app sends the user a notification when entering or is in a high/high-medium crime rated area, which will then cause a long vibration on the phone to inform the user that they should be careful of their surroundings. In addition, this app allows users to enter a destination and a time to check if an area has a high crime rate or not. This app is targeted towards people who are walking to their destination within Chicago. We believe this app would be most useful for college students and just anyone in Chicago, in addition to others who are not familiar with their surrounding environment.

210. Palnitkar, Harish and Royston, Thomas J.

**Audible Human Project: non-invasive diagnosis of pulmonary ailments through application of mechanical wave motion**

*Graduate / Professional - Mechanical and Industrial Engineering*

The Audible Human Project aims at developing a comprehensive, subject-specific computational model of sound propagation in healthy as well as diseased human lung parenchyma. The long term goal of the project is to develop computational tools that aid in non-invasive diagnosis of lung pathologies. Prior work of the research group has involved development of two techniques to generate and measure mechanical wave motion inside the human lung parenchyma. The first technique, known as insonification, involves application of pressure (sound waves) at the trachea, leading to the generation of wave motion inside the airways and lungs. The second technique, known as percussion, involves application of vibratory motion at the sternum (chest surface), causing mechanical waves that
travel from the surface of the torso, in to the lungs. In both of these techniques, the resulting wave motion leads to vibrations inside the lungs as well as the torso, which are then measured at the posterior (back) surface of torso using a laser Vibrometer. In the prior studies, both of these techniques were experimentally validated on healthy human subjects. The current work is an extension of this computational study in order to simulate mechanical wave motion in lungs affected by pathological conditions of pneumothorax and pneumonia. The authors demonstrate the validity and relevance of these two techniques (insonification and percussion) as potential non-invasive diagnostic tools to detect the presence of lung pathologies, namely, pneumothorax and pneumonia.

211. Pambuccian, Felix and Kosacz, Daniel

**Does Disgust Impact Severity of Moral Judgments? The Influence of Metaphoric Transfer**

*Graduate / Professional - Psychology*

The research question investigated in this study is whether moral judgments of an actor's behavior are influenced by whether the actor is described in a way that triggers visceral disgust. This question is based on the observation that we often use language related to disgust to metaphorically convey moral judgments (e.g., what she did was so disgusting). In the conceptual metaphor view, this could suggest that disgust functions as an embodied metaphor for morality - that is, we use the more concrete and experiential domain of disgust to conceptualize the more abstract domain of morality (Landau et al., 2010). A consequence of metaphoric mappings (e.g., the conceptual mapping between disgust and morality) are metaphoric transfer effects, which occur when conceptual mappings affects a person's thinking, behavior, or perception. For instance, exposure to physically disgusting stimuli increases the severity of moral judgments (Schnall et al., 2008). In this experiment we were interested in whether moral judgments are affected differently depending on whether disgust-triggering descriptions are specifically applied to a moral actor. In our experiment (N=60), we presented participants with short passages describing a person engaging in a morally objectionable behavior (e.g., spreading a rumor about a colleague at work). Three versions were created for each passage: in each version, the disgust-triggering description was either 1) not present; 2) applied to the actor; or 3) applied to the scene. Participants rated how immoral they found the actor's behavior. Participants’ made more severe moral judgments when passages contained disgust-triggering descriptions, but this effect did not differ depending on the location (actor vs. scene) of the disgust-triggering description. This may indicate that triggering visceral disgust affects moral judgments regardless of any logical connection to the actor being judged,
supporting the conceptual metaphor view of disgust as an embodied metaphor for morality.

212. Panchapakesan, Kailash; Saleh, Yaseen; Xiang, Bing; Valencia-olvera, Ana Carolina; LaDu, Mary Jo and Karstens, Aimee James

Effects of APOE Genotype and Sex on the Plasma Lipoprotein Profile of EFAD Mice

Undergraduate - Anatomy and Cell Biology

Alzheimer's disease (AD) is the 6th leading cause of death in the United States with no cure, few palliative treatments, and no prognostic biomarkers. The greatest genetic risk factor for AD is APOE4, increasing risk 5- to 15-fold compared to the common APOE3, and is compounded by female sex. Apolipoprotein E (apoE), encoded by APOE, is a protein component of both plasma lipoproteins, the only apolipoprotein in the brain, and a regulator of cholesterol transport in the CNS and periphery. Typically, blood lipid panels report total lipids and lipids associated with isolated lipoproteins, specifically VLDL, LDL and HDL, with an emphasis on cholesterol HDL/LDL ratios. In contrast, plasma lipoprotein profiles elute intact lipoprotein particles from largest to smallest i.e., Chylomicrons/VLDL, LDL, HDL-2, HDL-3, and free proteins that can be analyzed for lipid/protein content (e.g., cholesterol). This profile is APOE-dependent. The signature APOE genotype effect on plasma lipoprotein profiles and detectable shifts (i.e., leftward being dyslipidemic) over time may be a surrogate blood biomarker for AD. We hypothesize that as a prognostic AD biomarker, the plasma lipoprotein profile will reflect the AD risk associated with age, APOE4 genotype, and female sex. In the novel EFAD mice, which over-expressing Aβ42 and express the human APOE genotypes (E2FAD, E3FAD, E4FAD), our lab previously showed: E4FADs exhibit less co-elution of cholesterol in HDL and older mice exhibit increased co-elution of cholesterol in Chylomicrons/VLDL. We extended this work to include sex, thus identifying the interactive effects among age (6- and 18-months), APOE genotype (E3FAD, E4FAD), and sex (male, female) on plasma lipoprotein profiles. Results demonstrate that female sex exacerbates the effects of age and APOE genotype on the plasma lipoprotein profile. This work will help establish the plasma lipoprotein profile as a surrogate biomarker for pathology in AD.

213. Panek, Susan

English Language Learners at the University of Illinois at Chicago Writing Center
Undergraduate - Writing Center

My experience tutoring at the UIC Writing Center has opened my eyes to the various obstacles that writers face, in particular writers who are English Language Learners (ELL). This inspired me to establish a qualitative research project investigating how the Writing Center can best support ELL writers not only in learning grammar and/or culturally specific writing conventions but also with the discrimination and stigmatization that they often face based on their not-yet-developed knowledge of Standard American English. The research question explored was: What are the possible advantages and disadvantages of a multilingual tutor working with an ELL writer in a peer tutoring session at the UIC Writing Center? The research method applied was a literature review, as well as interviews with and surveys given to participants including UIC Writing Center Tutors and writers (both native English speakers and ELL) as well as TESOL teachers and scholars. The research results suggested several benefits to multilingual tutors for ELL writers, including shared experiences from language learning and overcoming language obstacles, similar cultural insight, and the establishment of a sense of commonality. The results from the surveys and interviews displayed that certain disadvantages can be overcome through equal efforts by the writer and tutor. The research implications ultimately are that it is immensely important to make all tutors, not solely multilingual tutors, approach ELL writers in an empathetic, understanding and non-stigmatizing manner.

214. Parikh, Hiral

Sexual Abuse Education in Gujarat

Undergraduate - Health Systems Science

Child sexual abuse is a problem that affects millions of children worldwide, and in many countries, children are not given adequate information and skills to overcome incidences of abuse. In India, over 50% of children face some form of sexual abuse, but many children do not report the incidences. According to the WHO, education plays an important role in empowering children and giving them the skills necessary to protect themselves and their health. In this literature review, the extent of child sexual abuse in Gujarat, India is examined as well as local resources and laws children can use to their advantage. Key informant surveys were conducted to scope the extent of the problem in Ahmedabad, Gujarat. Successful curriculums for educating young girls about child sexual abuse were also studied to create a sexual education and abuse awareness curriculum for Gujarati high schools.
215. Parise, Vincent; Xu, Lianyan; Mehta, Yash and Aldrich, Leslie N.

**Stereoselective Synthesis of 4-amino-3-hydroxybenzopyran Flavonoid Derivatives from Chalcones**

*Undergraduate - Chemistry*

Flavonoid natural products have a rich history of biological activity and therapeutic benefits. To explore the activities of natural product-like flavonoid analogues, a 5-7 step reaction sequence to stereoselectively create 4- amino-3-hydroxybenzopyrans has been developed. This route can be easily modified to incorporate various substituents at several positions to yield different products with potentially very unique biological activities. The benzopyrans were synthesized from chalcones, which were readily accessible using previously developed microwave-assisted aldol conditions. Epoxyalcohols were synthesized through a Corey-Bakshi-Shibata reduction of the chalcone precursors, followed by a Sharpless asymmetric epoxidation of the allylic alcohols. Various alcohol protecting groups were then explored to determine the effects of alcohol protection on the regioselectivity of the epoxide opening reaction. The TBS ether proved the most efficient because it did not affect the regioselectivity of the subsequent reaction and would enable the incorporation of a tandem deprotection/intramolecular nucleophilic aromatic substitution reaction to provide the desired benzopyran products. The epoxyethers were then regioselectively opened with various amines and catalytic Eu(OTf)3, and the resulting free alcohols were orthogonally protected as the benzyl ethers. The concomitant deprotection/cyclization was successful and provided the benzopyran core, which was further derivatized to give various analogues for biological evaluation.

216. Patel, Dhruv; Patel, Shital; Lawal, T.O. and Mahady, G.B.

**Curcumin inhibits the growth of colon, breast and ovarian cancer cells by inducing apoptosis and inhibiting HDAC1**

*Undergraduate - Biology*

Over the past 20 years there has been considerable interest in traditional systems of medicines used for the treatment of many diseases, including cancer. In Ayurveda, both curcumin and ginger are used to treat gastrointestinal ailments and these plant-based medicines have also been used as interventions for both gastric and colon cancer. Curcumin has a number of biological activities that may indirectly explain its chemopreventative effects including antioxidant effects, suppression of NF-kB activation, inhibition of the expression of c-jun, c-fos, c-myc and iNOS, inhibition of prostaglandin biosynthesis and inhibition of
cyclooxygenase. In the present work, we assessed the effects of curcumin on the growth of colon, breast and ovarian cancer cell lines. The human colon cancer cell lines used were HCT116, breast cancer cells MCF-7 and ovarian granulosa cancer cells (COV434). Cells were grown and maintained in appropriate medium and were harvested by adding 0.25% trypsin/EDTA and counted by means of trypan blue and hemocytometer. Culture medium was aspirated and fresh medium added to the wells before reconstituted extracts at 100, 50, 20, 10 and 5 µg/mL were added. After 72 hrs, the plate and its contents were treated with 100 µL of CellTiter-Glo 2.0 Reagent (Promega Corporation, Madison, WI, USA) according to manufacturer’s instruction. Luminescence signal was read using the Synergy HT Plate reader (Biotek, Winooski, VT) and Gen5 1.11 software. Curcumin inhibited the growth of HCT-116 cells with an IC50 of 8.9 mcg/ml. Curcumin had a biphasic effect on HDAC1 and increased its expression after 2 hrs at very low concentrations, but at higher concentrations (5-10 µg/ml) it inhibited the expression of HDAC1 mRNA. Similar effects were observed for p53. At 5-10 mcg/ml Curcumin significantly increased the Bax/Bcl-2 ratio indicating that this compound induces apoptosis in HCT-116 colon cancer cells.

217. Patel, Maya; Arzuaga, Anna and Raggozino, Michael E.

Behavioral Effects of Maternal Stress on Offspring of Fragile X Knockout Mice

Undergraduate - Psychology

Fragile X syndrome (FXS) is a genetic disorder that results in mild to moderate intellectual disability. The disorder results from mutation of the FMR1 gene that codes for the FMR1 protein, which plays a role in the development of synapses. FXS is the most common monogenic syndromic form of autism (a neurodevelopmental disorder). However, only approximately one-third of FXS individuals meet the criteria for autism. This project explores whether certain environmental conditions may interact with a FMR1 mutation to increase the risk of autism-like behaviors. Epidemiological studies suggest that pregnant women prescribed a selective serotonin reuptake inhibitor (SSRI) to treat depression may increase the risk of autism in offspring. However, it is unclear whether depression alone is a risk factor or the combination of depression with SSRI treatment may increase risk. Further unknown is how these conditions may interact with genetic factors to increase risk of autism in offspring. This experiment began to address these issues by determining how restraint stress (used to model “depression”) in FXS knockout and wild-type mice affects repetitive motor behaviors (self-grooming), anxiety and behavioral flexibility (probabilistic reversal learning) in male and female offspring. Starting on day 4 of gestation, pregnant mice were placed in a plastic restrainer for 30 minutes three times a day. This occurred through day 18
of gestation. Starting at 8 weeks of age, male and female offspring received a battery of behavioral tests (self-grooming behavior, elevated plus maze testing, spatial discrimination learning and reversal learning). The findings indicate that FXS mice experience impairments on a probabilistic learning task compared to wild-type mice. This indicates that FXS mice experience behavioral flexibility deficits compared to wild-type mice. Future studies will examine how both prenatal SSRI exposure and the combination of prenatal depression and SSRI exposure affects offspring behavior in FXS knockout mice.

218. Patel, Nirali

**CRISPR mechanisms in the editing of the sickle cell causing genetic mutation**

*Undergraduate - Biological Sciences*

Based on a preliminary analysis of the mechanisms of CRISPR and its usage for the editing of the sickle cell causing mutation, it has been determined that CRISPR is not yet precise enough to alter a specific nucleotide in the human genome while also ensuring that no secondary mutations occur as a result of introducing the new DNA segment. For purposes of using CRISPR in the repair of this mutation, scientists must design a specified enzyme, targeted gRNA, and appropriate DNA segment through which the mutation can be reverted while all other base pairs remain untouched. Currently, ethics play a determining role in the advancement of research and enabling of researches to introduce gene editing mechanisms into human subjects. This literature review is currently in the preliminary stages and looks to uncover possible changes to the mechanisms being used in partnership with CRISPR, and is attempting the analyze the ethical issues accompanied with the research and to provide possible experimental changes that can help alleviate some of the controversy.

219. Patel, Raj; Mathew, Biji; Chennakesavalu, Mohansrinivas; Torres, Leianne; Tran, Sophie; and Roth, Steven

**Mesenchymal Stem-Cell Derived Extracellular Vesicles in Retinal Ischemia**

*Undergraduate - Anesthesiology*

When the retina undergoes an ischemic injury, the regenerative potential of the retina in injury, especially of retinal neurons, is very limited; however, Mesenchymal Stem-Cells (MSCs) have been proved as robust neuroprotective bodies, although they suffer from low cell integration and aberrant growth. Our previous studies, using a rat model of retinal ischemia, have shown the protective effects of MSCs and MSC conditioned media (CM) when injected in the vitreous.
Considerable evidence suggests paracrine protective mechanisms of MSCs in the retina. MSCs produce extracellular vesicles (EVs) which specifically have involvement in intercellular communication and are capable of transferring protein and miRNAs between cells. EVs derived from MSCs show regenerative, and anti-inflammatory properties similar to their cell of origin, but without complications such as rejection, tumor growth, poor tissue integration. Therefore, neuroprotective effects of MSCs are largely mediated by EVs in retinal ischemia, and are related to anti-apoptosis and anti-inflammatory actions. EVs were isolated from MSC CM and characterized by Western Blot, Nanoparticle Tracking Analysis (NTA), and Transmission Electron Microscopy. In vitro, the R28 cell line was subjected to Oxygen Glucose Deprivation (OGD) where the experimental group were OGD, OGD+MSC-EVs, and OGD+CM minus EVs as the control. LDH assay measured dose dependent effect of MSC-EVs on OGD induced cytotoxicity of R28 cells. In vivo, Wistar rats subjected to intraocular pressure in one eye were injected intravitreally with EVs in both eyes. The outcomes measured were electroretinogram (ERG), TUNEL by cryo-sectioning, and Western blotting for inflammatory mediators. Uptake to EVs in the in vivo retina was studied using fluorescently labeled EVs, retinal flat mounts, cryosections, and real-time in vivo imaging. MSC derived EVs confer significant neuroprotective effects in an in-vitro and in vivo model of retinal ischemia by functional recovery, enhanced neuroprotection, decreasing cell death, increasing cell viability, and increasing cell proliferation.

220. Patel, Shraddha; Barrengolts Elena, Akbar, Arfana and Kukreja, Subhash

Effect Of High-Dose Vitamin D Repletion On Glycemic Control In African American Men With Prediabetes And Hypovitaminosis D

Undergraduate - Biological Science

Previous research suggests that higher levels of vitamin D blood are related to better health outcomes including type 2 diabetes mellitus (T2DM) and cardiovascular disease (CVD. However, there is still a doubt on whether supplying vitamin D supplements could improve the above mentioned health outcomes. A population of interest are the African American male at VA healthcare with diagnosed high risk for T2DM. The goal of this study was to learn about the efficiency of vitamin D treatment in improving the early symptoms of T2DM, CVD and inflammation while comparing it to placebo treatment in African American male veterans with high risk of T2DM. To do this, random assignment AAM veterans with increased level of plasma glucose ranging between 95-125 mg/dl and low levels vitamin D (25OHD<20 ng/ml) to consume a weekly dose of vitamin D ergocalciferol 50,000 IU (D2) or placebo (PLA) on a continuous basis for 12 months. There were 90 subjects per group according to power analysis and a 15%
The drop out rate in the study was assumed. The clinical measurements were taken during baseline and at the end of the study. The following tests were performed: anthropometrics, HbA1c levels, lipid profile, along with complete oral glucose tolerance test and intravenous glucose tolerance test (FSIVGTT). The Biorad BioPlex Multianalyte Profiler was used to measure bio-markers relating to inflammation. Examples of biomarkers for T2DM include interleukin-6 and tumor necrosis factor-alpha while the examples of cardiovascular disease include sensitive C-reactive protein and plasminogen activator inhibitor-1 and the biomarkers for adipokines include adiponectin and leptin. At 6 months interval, fasting glucose levels and HbA1c levels were measured. To maintain the predetermined range of 40-100 ng/ml of 250HD, the amount of D2 was adjusted every 3 and 6 months while still maintaining the double blind design of the study. The result of the study will be determined by the difference of post-treatment and baseline in oral glucose insulin sensitivity (OGIS) calculated from OGTT via the use of Mari's formula. The main parameter of FSIVGTT is the insulin sensitivity. This measurement also provides an estimate of how the insulin can lead to glucose disposal based on Bergman's Minimal Model. Based on our hypothesis, that after 12 months, there will be a 10% increase in OGIS due to while the SI will increase by 20%. Because the P value is < 0.05, the changes in OGIS and SI are significant compared to the values of PLA. According to our hypothesis, there is a significant improvement of about 10-25% in biomarkers of D2 compared to biomarker values of PLA group. It is expected that the African American male subjects will be better able to tolerate D2 levels without any significant adverse effects. If the results of the study are positive, than it it can be concluded that intake of vitamin D might be helpful in improving glucose metabolism by increasing insulin-glucose interactions. This is possible due to simple, weight-independent, and cost-effective intervention. Typically, it is very hard to make lifestyle changes in order to maintain and prevent T2DM which is why consuming D2 is a potential factor to maintain T2DM. In order to make a conclusive statement about its use in pre-diabetic patients, the study should be ran for multiple trials, longer time and the data should be collected from larger population.

221. Pedroza, Heidy

*Soy Como Tu: The Importance of Latinx Teachers in Chicago Urban Schools*

*Undergraduate - Curriculum and Instruction*

The discrepancy between the number of Latinx students and teachers is alarming as the Latinx population continues to rise within public schools all over the nation. This paper explores the ways in which Latinx teachers talk about their self-identification, their language use, and their experiences working with students within urban Latinx-populated schools. The larger study conducted qualitative
interviews (testimonios) with Chicago-area Latinx teachers working in predominantly Mexican immigrant communities to document their experiences in Latinx schools. I selected three interviews (Rico, Lourdes, Roxanne) to analyze because these teachers worked in elementary schools, had less than seven years of teaching experience, were of Mexican heritage, and identified as Spanish-English bilinguals. All three teachers identified themselves as Mexican or Mexican American, and therefore identified racially/ethnically with the majority of students in their classrooms. Through the testimonios, all three teachers share their unique experiences as Latinx teachers in urban Latinx-populated schools in Chicago. All three teachers share common identifying markers with their Latinx students such as: their racial and ethnic self-identification, language practices, and shared experiences. Importantly, Rico uses the word “us” when he refers to talking about himself and his students. Lourdes expresses confusion with self-identifying racially. For example, she states, "I think, um, the race question I always leave blank. Like I think we are told as Latinos to identify as White because that's the most fitting, but I don't identify as White." Instead, she identifies herself as Mexican American. Roxanne identifies as both Mexican and Mexican American without hesitation or opinion on the difference between the two terms. The identity expressions and experiences of these teachers sheds light on the question of what are the potential affordances of Latinx teachers working in predominantly Latinx schools in Latinx immigrant neighborhoods.

222. Penny, Steven and Max Berniker

Neuromotor Control and Forward Model Estimation using Artificial Neural Networks

Graduate / Professional - Mechanical Engineering

When animals make voluntary movements, it is theorized that several control processes come together to make the movement successful. Sensory inputs from both vision and proprioception provide an estimate of the limbs location in space. A controller uses this information and predicts how much force the muscles should produce to take the limb to a desired location. Finally, a forward model utilizes both the current state information and command to the muscles to predict where the limb be at the next instant in time. Together, these mechanisms help control a limb accurately despite the noise in sensory information and command to muscles. Here, we have trained a spiking artificial neural network (ANN) to replicate these processes. Using binary representations of sensory state input and command, we have trained an ANN to act as a controller to move a simulated hand across a workspace using “muscles” of varying strengths. Another network was trained to use that noisy command signal and an estimate of the current state to predict where the hand would end up at the next time step. We find that the simulated
hand performs movements similarly to human voluntary movements. Additionally, the neural firing patterns of the ANN exhibit common characteristics found in motor behavior studies at both the individual neuron level (i.e. directional preference / cosine tuning) and population level (i.e. population vectors and low-dimensional projections of dynamics). Once finalized a working model that performs similarly to a healthy human can be disassembled by removing important neurons or connections between neurons. In this impaired state, we can compare the model’s movements to those of people with common motor diseases and make sound predictions about how these disease form.

223. Perkowski, Mark; Kim, Eunice; Silva, Jose O.; Dhakal, Radhika; Surma, Victoria and Warpeha, Katherine M

Phenylalanine plays important roles in cell division processes: a study using analogs

*Undergraduate - Biological Sciences*

In the seed-to-seedling transition of plants, embryos are exposed to various environmental and chemical stressors. Prior to independently synthesize compounds and energy through photosynthesis, the embryo must balance available resources from the seed and the surroundings to both respond to environmental conditions and grow. The amino acid phenylalanine has been shown to play a crucial role in embryonic to seedling development, particularly in the homeostasis of reactive oxygen species (ROS) and structure formation. The enzyme arogenate dehydratase 3 (ADT3) catalyzes the final step of the biosynthesis of phenylalanine form arogenate in the shikimate pathway. Seeds of wild type and adt3 mutant Arabidopsis thaliana were grown in identical conditions. After germination, we supplied exogenous phenylalanine analogs to determine the ability for the analogs to restore or otherwise impact plant morphology and rates of cell division in the apical meristem of the developing plant. Investigations utilizing chemistry and three-dimensional analysis indicate phenylalanine mediates aspects of cell division in seedlings. Potential effects of phenylalanine analogs in inhibiting or promoting cell division give clues regarding phenyalanine’s roles. Phenylalanine treatments have applications in optimizing plant growth for human use and cross-application to factors underlying cell division in animal cells.

224. Pham, Christine; Valencia-Olvera, Ana; Saleh, Yaseen; Collins, Nicole; Balu, Deebika and LaDu, Mary Jo
Determining Accuracy of oAb as a Mechanistic Biomarker for Alzheimer’s Disease in Human Plasma

Undergraduate - Anatomy and Cell Biology

Alzheimer’s disease (AD) is a fatal neurodegenerative disease that is the 6th leading cause of death in the United States with no cure and few palliative treatments. Currently, there is no preventative treatment, and even if such a therapeutic could be identified, without a predictive biomarker, a target population for treatment could not be determined. Although the mechanism remains unclear, AD is caused by increased levels of the amyloid-B peptide (Ab), which aggregates to form both amyloid plaques and soluble oligomeric Ab (oAb), the latter considered a proximal neurotoxin. We believe that levels of oAb in human plasma are a prognostic biomarker, and have developed and licensed a method for their detection (LOD <5pMol). While age is the greatest risk factor for AD, APOE4 is the greatest genetic risk factor, increasing risk up to 15-fold compared to the more common APOE3. Importantly, female APOE4 carriers have an increased risk for AD compared to male APOE4 carriers. Key to the success of this project has been the stratification of both control and AD patients by sex within APOE genotype, with the results that plasma oAb levels are: APOE4 females > APOE4 males ≥ APOE3 females > APOE3 males. This response was observed in two large human post-mortem cohorts. However, stratification, the principle of personalized medicine, is simply not applied to AD populations. We now seek to threshold oAb levels using longitudinal and human AD trial data to establish prognostic potential, with the goal of partnering with the private sector for commercialization.

225. Poon, Jessica

Regenerative Endodontics: Root-Repair Case Report

Undergraduate - Biological Sciences

Delving into the broad topic of regenerative endodontics, the different biomaterials that are used to set necrotic permanent teeth after endodontic procedures are extremely important to the field of endodontics. In terms of biomaterials, the traditional treatment method has been using Mineral Trioxide Aggregate (MTA) for a one-step apexification of the tooth root. However, a new bioceramic-based material called EndoSequence Root Repair Material (ERRM) has been claimed to provide a better controlled barrier placement and have better results. This ERRM can be used as an alternative to MTA. A case report on a patient using the new ERRM will be studied to see the effects of this new bioceramic material. Between an initial visit of a patient, a follow up appointment, a 6-month recall, and a 12-month recall, the patient’s procedure will be reported on along with x-ray pictures of the fixed tooth number 31. A discussion of the significance for using ERRM over
MTA will follow. From this case report, we will demonstrate the effectiveness of using the new bioceramic ERRM over MTA in terms of regenerative endodontic procedures.

226. Popova, Nikol; Kunzweiler, Colin; Diaz, Angelina; Alim, Jibril; Luciano, Monica and Eldeirawi, Kamal

Levels of Maternal Prenatal Psychosocial Stress and Salivary Cortisol Among A Sample of Pregnant Mexican American Women

Undergraduate - Nursing

Introduction: Research over the past few decades shows increasing evidence that exposure to prenatal stress is associated with complications in both the newborn and the mother. Although studies have examined psychosocial stress in women, few studies have specifically examined stress levels among pregnant Mexican American (MA) women. This population is especially vulnerable to the stresses associated with immigration/acculturation and those related to low socioeconomic status. Therefore, it is crucial to understand how immigration status and other sociodemographic factors are correlated with psychosocial stress and biological markers of stress in this population. Purpose: The purpose of this study is to describe levels of self-reported psychosocial stress and biomarkers of stress (saliva cortisol) during pregnancy in a sample of 33 pregnant MA women. In addition, we will examine how levels of psychosocial stress and biomarkers of stress vary by immigration status and other sociodemographic factors. Methods: Thirty-three pregnant, self-identified Mexican American women were recruited in the study before their 17 weeks of gestation. Psychosocial stress was measured by self-reported questionnaires including the 10-item Perceived Stress Scale, 10-Item Edinburgh Postnatal Depression Scale, Life Events Inventory Scale, and Perceived Neighborhood Scale. We used salivary cortisol as a biological marker of stress. Four saliva samples a day (awakening, 30 minutes after awakening, 4-6 hours after awakening or before lunch, and at bedtime) were collected over the course of 2 typical weekdays. Salivary cortisol values for a given time point were log transformed and then averaged over the two days. Results: This section will be discussed in the poster presentation. Conclusion: This section will be discussed in the poster presentation.

227. Prims, JP and Motyl, Matt

Comforting conspiracies: Conspiracy theories buffer against anxiety

Graduate / Professional - Psychology
Theories of conspiracy belief assert that people believe conspiracy theories to cope with anxiety-provoking events. To date, evidence for a link between conspiracy belief and anxiety is mixed. The current study examined the link between conspiracy belief and anxiety using a self-report measure of anxiety. Generic conspiracy belief predicted less self-reported anxiety. Belief in a specific conspiracy theory did not predict anxiety. Consistent with theories that conspiracy beliefs help people cope with anxiety-provoking events, anxiety was lower when participants were presented with a conspiratorial explanation for a threatening event, than when they were presented with a non-conspiratorial explanation for the same event, controlling for baseline levels of anxiety. Finally, people high in generic conspiracy belief reported less anxiety when presented with a threatening event with a conspiratorial explanation, than when presented with a neutral event. These findings suggest that conspiracy theories may reduce anxiety about threatening events.

228. Qarni, Fatima

**Google Pensieve: A Google Data Analysis Tool**

*Undergraduate - Computer Science*

Most users of Google, Facebook, Dropbox, and other cloud-based storage sites have years, if not decades of personal information stored on their accounts, and much of this data could potentially be sensitive. In the case that any of these accounts become compromised, a huge amount of personal data would be in the hands of someone else. For this reason, it is important to be aware of what type of data one has at risk, and also to better understand what a user should be more careful about putting onto their cloud-based accounts, or what they may want to take down. This project attempts to find a way to analyze Google data for a given user by creating a program which can first process, then index and categorize available Google Takeout data (a complete file of Google data which can be downloaded from one’s account), including Gmail, Google Photos, Drive, Search, and YouTube data. This data is processed by means of file meta data such as time and location, as well as photo recognition software and html parsing as necessary, and uploaded to Elasticsearch, which makes it easy to quickly access and search through all of the data simultaneously, rather than having to individually search through each Google product. As a second part of this project, available data is visualized by time, which allows the user to see the quantity of data they have stored over the years. It also allows an option to either use the preset "risk" keywords or enter one’s own to highlight data on the graphs that would be potentially be a security risk. This would allow a user to quickly become aware of risky data on their account that they may want to review, encrypt, or remove in order to make their account more secure.
229. Raziuddin, Humair and Malone, Margaret

Pescados blancos: Going back in time to understand the trophic consequences of a century of heavy fishing in Lake Chapala

Undergraduate - Biological Sciences

I aim to examine the evolutionary and ecological processes of four species of fishes in the genus Chirostoma (pescados blancos) in Lake Chapala by analyzing the trophic position via stable isotopes and cranial morphology. Chirostoma are an important food source for people in Central Mexico and are heavily fished locally and commercially. Previously published literature shows similar δ13C and δ15N stable isotopes among the members of Chirostoma, displaying an overlapping trophic niche. Even though species of Chirostoma have a trophic overlap, the morphology of the species is very different. I hypothesize that this paradox of different feeding morphology coupled with a similar trophic position is due to changes in ecological pressures occurring in this region. Disparate morphology reflects the evolutionary history of the species, while trophic position reflects current ecology in these lakes. Fishing pressures from locals may have caused the convergence of trophic position. Moreover, Chirostoma might have switched prey types to account for ecological pressures. I will use long term data available through museum collections to assess changes in these species from 1900 to today. I will use δ13C and δ15N stable isotopes to determine their trophic position and also analyze morphology through geometric morphometrics. This study will provide valuable information on the economically important Mexican fishes and the consequences of 100 years of anthropogenic pressures on ecology and evolution.

230. Rebollar, Aletia

Language Specific Phonological Activation in Spanish-English Heritage Speakers

Undergraduate - Hispanic and Italian Studies

Two main theoretical perspectives explain the manner in which bilinguals activate phonological information (Levelt 1999; Levelt, Roelofs & Meyer, 1999). The Language Specific Phonological Activation perspective predicts that bilingual speakers activate phonological segments in the intended language only. The Language Non-Specific Phonological Activation perspective predicts that bilingual speakers activate similar phonological nodes from both languages, regardless of the intended language. This study was carried out to test which of the two speech production models better predicts the activation of phonological segments in bilingual speakers. A color naming task was utilized to evaluate whether Spanish-
English heritage speakers (i.e. acquired both languages before the age of 6) activate phonological segments of the non-target language. Participants were presented with 54 single-colored pictures and the task to name the color of each picture in English. The naming response times were evaluated in two conditions: when the phonological relationship of the color name and picture name was phonologically related and when it was phonologically unrelated. The speakers in this study exhibited longer response times in naming the color of pictures in English when the color names and picture names were phonologically related instead of phonologically unrelated in the non-target language. The result support the Language Specific Phonological Activation Model and suggests that heritage speakers activate only the phonological information of the language used in speech.

231. Reddy, Abhinav; Ryoo, James; Denyer, Steven; McGuire, Laura and Mehta, Ankit

Determining the role of adjuvant radiotherapy in the management of meningiomas: a Surveillance, Epidemiology, and End Result (SEER) analysis

Objective: The aim of this study was to illustrate the demographic characteristics of meningiomas and observe the effect of adjuvant radiation therapy in patient survival using the Surveillance, Epidemiology, and End Result (SEER) database.

Methods: SEER data was queried from 1973-2015 for benign, atypical, and anaplastic meningiomas using appropriate ICD-O3 codes. Patient demographics, tumor characteristics, and treatment choices were analyzed. The effects of treatment regimen were examined using multivariate Cox proportional hazard modeling and Kaplan-Meier survival analysis. Results: 57,998 patients were included in the analysis of demographic, tumor, and treatment characteristics of meningiomas. Of this population, cases of unspecified WHO tumor grade were excluded in the multivariate analysis, resulting in 12,931 patients for examining outcomes between treatment paradigms. In benign meningiomas, gross-total resection (HR 0.289, p=0.013) imparted a significant cause-specific survival benefit over no treatment. In anaplastic meningiomas, adjuvant radiotherapy imparted a significant survival benefit in both subtotal (HR 0.089, p=0.018) and gross-total resection (HR 0.162, p=0.002) patients compared to those who were treated with only gross-total resection. In atypical tumors, gross-total resection with radiotherapy did not significantly change hazard (HR 1.353, p=0.628) compared to gross-total resection. Similarly, adjuvant radiation did not significantly benefit survival after a subtotal resection (HR 1.440, p=0.644). Conclusion: The results of this study demonstrate that the role of adjuvant radiotherapy, especially after resection of atypical meningiomas, remains somewhat unclear. Thus, prospective
clinical studies based on these results is warranted to provide clear information on the effects of adjuvant radiation in meningioma treatment.

232. Reddy, Sahana

**The Correlation Between Second Language Acquisition and Intelligence**

*Undergraduate - Hispanic and Italian Studies*

Each decade in the US, bilingualism is a growing phenomenon, whether one learns a heritage language from their family or a second language (L2) in school. Research has shown that there is evidence of bilinguals having better cognitive skills compared to monolinguals, such as selective attention skills. In each study conducted on this topic, IQ is a factor that has typically been a control variable so that an individual's intelligence does not interfere with data on the relationship between cognitive ability and L2 learning. Because of this, there are very few studies that explore the relationship between IQ and L2 learning. However, those few studies show a relationship between intelligence and L2 learning. Therefore, my research project examines the relationship between IQ and L2 learning along with the relationship between L2 learning and L2 aptitude, which reliably predicts the ability to learn a new language. Participants in this project were between the ages of 18-22 and were given an L2 learning task where participants were shown pictures with words in an artificial language and then tested on how well they learned those words and their suffix rules. Participants were also given a shortened version of the Raven’s IQ test, in which they saw patterned figures and then had to choose a final figure that completed the pattern. An L2 aptitude test was also administered called the Modern Language Aptitude Test. The data obtained will be analyzed using linear regression models to see if IQ, L2 aptitude, or both predict L2 learning. Based on previous research, results will be expected to show a relationship between intelligence and L2 learning and a relationship between L2 aptitude and L2 learning, with L2 aptitude being shown to be a stronger predictor for L2 learning.

233. Rehman, Hibah

**A Meta-Analysis of Repeated Behavioral Field Experiments**

*Undergraduate - Economics*

This project is a meta-analysis of multiple information sets, including, original field experiment data, replicated experiment data, and working NBER papers. It is an update on classical field experiments that were once performed in Chicago by notable economists. Preliminary results show differences in the results shown by previous experimenters. More trials are being conducted by the behavioral
economics class throughout the semester and the final presentation will include more results.

234. Reyes Vega, Estephanie

**The Synergistic Effect of Ethanol and Cigarette Toxins on Ciliary Activity**

*Undergraduate - Biological Sciences*

Eighty percent of people concurrently drink alcoholic beverages while smoking tobacco products. Few studies have been conducted to determine if the simultaneous use of these products have a greater effect on the human respiratory system. This research project aims to show whether the combined toxins of ethanol and cigarettes have a greater effect on ciliary activity than the effects of their individual dose addition. The model organism that was used in this project is the protozoa Tetrahymena thermophila due to its similarity in structure and function to the cilia of the airway epithelium in humans. The effects of the toxins was studied via a dye feeding assay to measure cilia activity and immunofluorescence staining to assess cilia structure density. Tetrahymena rely heavily on its outer cilia to guide food particles into its cytosome. The dye feeding assay quantified the amount of food vacuoles that were formed in cells exposed to each toxin. The findings from this research project suggest that there is no synergistic effect between the toxins of ethanol and cigarette smoke on ciliary activity. However, decreases in function and structure were noted with the use of each toxin individually and concurrently. Findings from this study can possibly bring awareness to the public about the damages that alcohol and tobacco use may bring on the respiratory tract.

235. Rezazadeh, Alireza and Berniker, Max

**Force Field Generalization and the Internal Representation of Motor Learning**

*Graduate / Professional - Mechanical Engineering*

When learning a new motor behavior, e.g. reaching in a force field, the nervous system builds an internal representation. Examining how subsequent reaches in unpracticed directions generalize reveals this representation. Although often studied, it is not known how this representation changes across training directions, or how changes in reach direction and the corresponding changes in limb impedance, influence these measurements. We ran a force field adaptation experiment using eight groups of subjects each trained on one of eight standard directions and then tested for generalization in the remaining seven directions. Generalization in all directions was local and asymmetric, providing limited and unequal transfer to the left and right side of the trained target. These asymmetries...
were not consistent in either magnitude or direction, even after correcting for changes in limb impedance, at odds with prior explanations. Relying on a standard model for generalization, the inferred representations inconsistently shifted to one side or the other of their respective training direction. A second model that accounted for limb impedance and variations in baseline trajectories explained more data, and the inferred representations were centered on their respective training directions. Our results highlight the influence of limb mechanics and impedance on psychophysical measurements and their interpretations for motor learning.

236. Rinehart, Sydney; Shah, Reshma and Torres, Luz

Utilizing a Demonstrated Play Intervention to Increase Well-Child Care Access

Undergraduate - Applied Psychology

Hospitals have pushed to find ways to increase visit attendance, a huge boundary to medical care in low-income populations. Programs have utilized reminder calls and incentives to help increase the likelihood that a family will show up to well-child visits (Dini, Linkins, & Chaney, 1995). Parents expect access to developmental advice and support during their visits, but often get a short amount of time with their primary care providers (Berkule-Silberman, Dreyer, Huberman, Klass, & Mendelsohn, 2010). Interventions utilizing a care provider within the hospital outside of a medical professional have proven useful in increasing visit attendance, health literacy, and parent knowledge on development (Marsiglia, Bermudez-Parsai, & Coonrod, 2010). Sit Down and Play (SDP) is a research project aimed to empower parents with the information and skills needed to help improve their child’s early development through talk and play-based activities delivered by research assistants at UIC’s well child clinic. This project utilizes data from a larger battery of measures from the SDP project. The aim of this analysis was to understand and examine additional parental characteristics that may be associated with increased well-child visit (WCV) adherence. Additionally, we hypothesize that receiving a play-based intervention will be strongly associated with timely WCV's. We employed the use of Chi-square analysis and two-sample t-tests to test for differences within the baseline demographic characteristics. The use of Spearman's Rho correlations was used due to the nature of our ordinal and dichotomous variables, we employed the use of non-parametric tests. Our results were mixed, they demonstrate the need and importance of continuing to develop community-based interventions within the well-child care setting to empower and support parents. While the primary goal of SDP is to developmentally important talk and play behaviors in parents, this intervention could also be used to improve overall visit attendance and engagement.
237. Robinson, Zhivan

Diversity in the West: Korea’s affect on entertainment in the U.S.

*Undergraduate - Mathematics*

In today’s society, diversity is a hot button issue especially in entertainment. With the rise of Korean popular entertainment, beauty, and food, is the small nation spearheading the movement of diversity of people and language in America? Or is this a fad that will fade like other trends of foreign music has before in the past?

238. Rodriguez, Karla; Benson, B.; Kuchta, A. and Coumbe-Lilley, J.E.

Life After Death: Living After Career Sport Injury

*Undergraduate - Kinesiology*

Background: The article analyzes the emotional recovery of an injured athlete contrasted with the Grief Model (Kubler-Ross, 1969). The narrative expresses an athlete’s account of their loss of self-identity following traumatic brain injury (TBI). Objective: The study examines the loss of life purpose experienced by the TBI athlete and its impact on their identity. Method: A semi-structured interview was recorded (54 minutes) with a 23 year old former high school football player and wrestler. The audio was listened to 12 times. Transcription of the interview reviewed and coded 3 times. Thematic analysis was conducted with the research team and external member checking validated the findings. Results: The study demonstrated that a TBI athlete did not pass through the five-stage model (denial, anger, bargaining, depression, acceptance) as it has been presented in textbooks for the field. Denial, bargaining and depression were not observed cognitive emotional responses to injury. The athlete’s grief had been ongoing for six years. Conclusion: The study shows that the emotional recovery of a TBI injured athlete is not linear. The concept of grieving is personal and its progression is individual to each athlete. Findings suggest sport medicine professionals might be taught about how to use alternative emotionally based models such as the theory of self-efficacy and Bisconti’s oscillating model, for helping TBI athletes recover. Keywords: Grief Response Model; Sport Injury; Recovery; Emotional Response; Identity.

239. Romero Calvo, Isabel; Brennan, Kevin Michael; Lebowicz, Leah Amanda and Young, Christine
Visual data impact on comprehension and perception of educational animations for biomedical researchers

Graduate / Professional - Biomedical and Health Information Sciences

The efficient communication of complex scientific information is an ongoing challenge to medical illustrators and animators. The use of animation as an efficient learning method that enhances memory retention is well established. However, there is contradictory information regarding the level of detail that should be utilized. One line of research shows that an excessive amount of detail in an animation can be a distraction for the viewer and decrease retention of information. Opposing investigations indicate that detailed information is preferred and that it increases learning. These studies have also not addressed the biomedical community as the primary audience. Furthermore, the addition of detailed references was shown to improve the perception of credibility of animations for the research community, suggesting that referencing source materials is important to scientific audiences. This project will examine the level of detailed information preferred by a scientific audience. Specifically, it will be investigated if the depiction of direct scientific data in a scientific animation will improve perception and increase information retention by biomedical professionals. The animation will describe a new and rapidly advancing topic: cancer organoids in personalized oncology therapy. Two versions of this animation will be created to test perceptions of credibility, visual appeal, scientific relevance, and accuracy, and to examine information retention. One version will depict direct experimental data and one will depict a simplified schematic representation. This study will address the controversy regarding the varying levels of visual detail in animations and will address what is effective means of communication to an audience of biomedical researchers. Specifically, the question of whether using direct scientific data improves learning and perception, will be answered. Due to the constant evolution of the biomedical research field, it is crucial to effectively communicate new technological advances. This study will guide improvements in creating educational animations for biomedical professionals.

240. Rosas, Carlos

Intra- and Inter-group Discrimination and Mental Health among Latina/os

Graduate / Professional - Psychology

There is increasing concern about the mental health of Latina/os in the United States (U.S.), especially in the face of an unprecedented rise in anti-immigrant sentiments and legislation. Latina/o college students, in particular, report high rates of depression, anxiety, and other negative mental health-related outcomes. Prior empirical work suggests that perceived racial/ethnic discrimination contributes to
these negative mental health outcomes. Although Latina/os also report discrimination from other Latina/os (intragroup discrimination), most research on discrimination has focused on intergroup discrimination. This is an important gap in the literature as some work suggest that intragroup discrimination may also be distressing for Latina/os. Further, not all Latina/os perceive the same levels of both types of discrimination. Several sociodemographic, constitutional, and behavioral/psychological factors may influence perceptions of discrimination. Our knowledge on the role of these factors as correlates of intergroup discrimination is limited. And our understanding of these factors on perceptions of intragroup discrimination are almost non-existent. To fill these empirical gaps, the present study examined the associations between sociodemographic (gender, nationality), constitutional (skin color, socially assigned race), and behavioral/psychological factors (ethnic identity) and interand intra-group discrimination among a sample of Latina/o college students. Additionally, the study examined the relationships among inter- and intra-group discrimination and self-reported measures of depressive and anxiety symptoms and overall mental health. Findings showed that only skin color was related to perceptions of intergroup discrimination, such that darker-skinned individuals perceived more intergroup discrimination than their lighter-skinned counterparts. Both inter- and intra-group discrimination were related with worse mental health.

241. Rutkowski, Angela; Chu, Yaping; Mazzei, Gina; Muller, Scott and Kordower, Jeffrey H.

The Effect of MPTP on the Degeneration of Dopaminergic Neurons in Nonhuman Primate Models of Parkinson's Disease

Undergraduate - Neurological Sciences

Parkinson's disease (PD) is a neurodegenerative disorder affecting over 10 million individuals worldwide and over one million in the United States alone. The main pathology in PD is the loss of dopaminergic neurons in a brain region known as the substantia nigra (black substance), resulting in motor impairments like resting tremor, rigidity, and bradykinesia. There are several therapeutic strategies that are being used to treat the symptoms, however, none modify the disease course or terminate or decelerate the neurodegeneration of this disorder. In 1982, there was an incredible discovery; human subjects were self-administering what they thought was a pure synthetic heroin. However, the heroin was contaminated by a neurotoxin compound called 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP). To the naked eye, the symptoms of these patients resembled PD, and these patients responded markedly to anti-parkinsonian medications. After testing MPTP in a variety of animals, the species that proved to reproduce the clinical and
pathological hallmarks of PD most faithfully was nonhuman primates. Pathologically, MPTP causes a great depletion of dopamine in the caudate nucleus and putamen in the striatum and a loss of dopaminergic midbrain neurons in the substantia nigra pars compacta, which is directly analogous to what is seen in PD patients. The MPTP model also shows alterations of dopamine, norepinephrine, and serotonin outside of the striatum that are present in the brain of individuals with PD. As can be seen, the nonhuman primate model of MPTP in only monkeys accurately represents PD and has allowed for, and continues to allow for, tremendous discoveries in the field of PD.

242. Sabir, Maryam; Atteberry, Kim and Alfonso, Aixa

C. elegans Adult Males Lacking hlh-3 Function Show Altered daf-7 Expression in the ASJ neurons

Undergraduate - Biological Sciences

The Alfonso laboratory has evidence that the function of hlh-3 in C. elegans is necessary for the terminal differentiation of sex-specific neurons with sex-specific functions in hermaphrodites and males (Doonan et. al, 2008; Marquez, Perez, Raut, Alfonso, unpublished). They also know that amphid wing “A” (AWA) neurons do not appropriately differentiate in hlh-3 mutants (Marquez, Atteberry, Alfonso, unpublished). Though the AWA cells are not sex-specific, their function via the G-protein-coupled receptor ODR-10 is regulated differently in males. Thus, it appears that shared neurons with sex specific roles are also functionally defective in hlh-3 mutants. This project studies the shared amphid sensory “J” (ASJ) neurons to determine whether they too are affected by hlh-3 deletion. Hermaphrodites and males express daf-7 in the shared amphid sensory “I” (ASI) neurons. However, only males express daf-7 in the ASJs, where it has been shown by others to play a role in mate searching behavior (Hilbert & Kim, 2017). This project assays the differentiation state of the ASJs with the reporter pdaf-7::gfp in hlh-3 mutants and wild type animals. We find that daf-7 expression is altered in mutant males; most mutant males expressed daf-7 in two or three neurons, as opposed to four. Because of the stereotypic location of neurons in the wild type, it appears the missing cells in the mutant males are the ASJs. Mutant hermaphrodites did not show altered expression. Since daf-7 encodes a secreted molecule necessary for male searching behavior, we conducted a behavioral assay (leaving behavior), to determine whether hlh-3 mutant adult males, with altered daf-7 expression in the ASJs, also showed altered leaving behavior. We find that adult mutant males show defective leaving behavior, comparable to that of wild-type adult hermaphrodites. These results support the conclusion that deletion of hlh-3 function affects the differentiation of neurons with sex-specific roles, regardless of whether the neurons are shared between the sexes or unique.
Proactive Interdisciplinary Rehabilitation for People with Parkinson’s Disease: An Occupational Therapy Program Evaluation

Clinical practice guidelines recommend interdisciplinary rehabilitation for people with Parkinson’s disease (PD) by a team including occupational therapy (OT), speech therapy (ST), and physical therapy (PT). In early PD, proactive rehabilitation includes (1) baseline evaluations, (2) exercise prescription and self-management advice, and (3) addressing early impairments in walking, balance, voice, dexterity, and occupational performance. The purpose of this study is to describe the delivery patterns, patient characteristics, and baseline performance of people referred to proactive rehabilitation at one center, with a focus on OT. Retrospective data from electronic medical records were extracted manually. Patients were included if they were referred to the proactive rehabilitation program. Descriptive statistics are used to characterize patient demographics and OT measures including basic activities of daily living (BADL), instrumental activities of daily living (IADL), nine-hole peg test, grip and pinch strength. A total of 72 patients were evaluated in the following clinical combinations: 17 PT/OT/ST, 8 ST/PT, 3 OT/PT, 2 OT/ST, 0 OT, 4 ST, and 38 PT. 22 patients were seen in OT (73% male, 68 ± 11 years old). 77% of these individuals were in HY stage 1-2, and 73% were within 5 years of diagnosis. Most individuals (91%) reported requiring increased time for at least one BADL. Writing and keyboarding were problems for 45% and 32% of individuals, respectively. Average nine-hole peg test values were 33 seconds (L) and 34 seconds (R). Average grip and pinch strength measures were 61.7 lbs. (L), 61.8 lbs. (R), 17 lbs. (L) 17.8 lbs. (R), respectively. Eighteen patients attended one 90 minute session, 3 patients completed 1 additional visit, and 1 patient completed 5 additional visits. OT is the least common area of proactive rehabilitation. While the majority of people evaluated were relatively early in their disease, they presented with impairments in dexterity and hand strength.
Awareness of high prevalence of prediabetes and vitamin D insufficiency as well as related complications is expanding. Whether this knowledge translates into physicians evaluating and treating these common disorders in real world practice is unclear. We investigated whether men with vitamin D insufficiency and prediabetes had appropriate management after completing vitamin D trial “DIVA”. DIVA was a double-blind placebo-controlled trial of vitamin D (or placebo) supplements in African American men (AAM) with D insufficiency (25-hydroxyvitamin D, 25D<30ng/ml) and prediabetes (HbA1c 5.7-6.4%). DIVA trial was completed in 2013. We performed a retrospective chart review of 135 participants. We collected the data available for 113 men (average age 61 years) who had at least one follow-up with physicians over an average 5 years of follow-up. 61 men (53.9%) were found to be obese in their latest follow-up (BMI =/>30 kg/m2) compared to 79 men (69.9%) in the original study. The results showed that among 113 men 20 (17.7%) had 25D measured at least once during follow-up. The circulating 25D were described as deficiency (25D<20ng/ml), insufficiency (20-30ng/ml) or normal (30+ ng/ml) and were found in 5, 6, and 9 men, respectively. Only 4 of 20 (20%) participants were on vitamin D supplements. Overall 21 (18.5%) men were taking vitamin D3 supplements. Incident type 2 diabetes (T2D) was diagnosed in 24 (21.8%) men among 110 who had HbA1c measured at least once during the follow-up. In conclusion, physicians appropriately checked HbA1c in majority of AAM at high risk for T2D. However, physicians did not monitor 25D level or provided D supplements to men with previously diagnosed vitamin D insufficiency. The results suggested that physician in real world practice are unaware or tend to underestimate the importance of appropriate management of vitamin D insufficiency.

245. Samardzija, Tanja; Nyenhuis, Sharmilee and Weller, Katherine

Healthcare Provider Attitudes toward Physical Activity Counseling for Patients with Asthma

Undergraduate - Division of Pulmonary, Critical Care, Sleep and Allergy

Guidelines recommend that patients with asthma engage in regular physical activity as it can improve asthma control, reduce exacerbations and quality of life. Despite these recommendations, patients with asthma are less physically active than patients without asthma. The goal of this study is to assess healthcare provider attitudes/facilitators/barriers to physical activity counseling in patients with asthma. Survey questions were chosen based on a literature review of physical activity counseling by health care providers. We approached pulmonary, internal medicine and family medicine physicians/midlevel healthcare providers at monthly meetings at an academic university hospital. The 10-item survey was available on paper and as an email link. IRB approval was obtained, and survey responses
were analyzed using proportions of responses. We surveyed 75 physicians, including 35 residents, 38 attendings and 3 mid-level providers. Most of the Internal Medicine (IM) and Family Medicine (FM) survey respondents indicated that they were unsure of whether there is enough evidence supporting physical activity promotion for asthma patients (40.67%). Less than half of the respondents recommend physical activity for these patients (44.07%). Only 25% of the Pulmonary physicians indicated that they were unsure of whether there was enough evidence. Almost 60% of IM and FM physicians that recommend physical activity, only do so sometimes. The most common barrier IM and FM physicians face is time (26.67%) and forgetting to educate. Pulmonologists reported the patient being uninterested (53.3%) as the most common barrier. Other barriers include the lack of confidence in educating the patient and consideration of co-morbidities. Many healthcare providers are unsure of the recommendations for physical activity for patients with asthma and less than half of healthcare providers recommend moderate-vigorous physical activity in their asthma patients. This study provides preliminary data that may propel further studies that focus on improving healthcare provider physical activity counseling for asthma patients.
thoracic and abdominal segments. And most of the cuticle had teeth, which means that a head was about to be formed; however, the knockdown of the gene stopped the development of the cuticle. Which is something that will be studied in the future. It is necessary to analyze these genes in a deeper study focusing on the patterning genes of the anterior enrichment.

247. Sanchez, Ilse

An Analyzes of Immigrant Victims an Humanitarian Visas

Undergraduate - Criminal, Law, and Justice

Migration is defined as the process of leaving one location and moving to another with the intent of temporary or permanent settlement. Migration is woven into the fabric of American history and culture. Past and current policies promote, regulate, restrict, and deter migration into the United States. For those who migrate into the United States illegally, they experience higher chances of being victims of crimes such as human trafficking, domestic violence and child abuse. Congress created several forms of immigration relief that are available to immigrants who are victims of these crimes. This study analyzes the closed cases that a law firm, managed from the year 2013-2019. This law firm specializes in T nonimmigrant status, U nonimmigrant status, Violence Against Women Act (VAWA), Special Immigrant Juvenile Status, and Deferred Action for Childhood Arrivals (DACA). This study will analyze who the victims who apply for these humanitarian visas are. What are the circumstances, obstacles, and situations that allow them to be vulnerable to crime. I will be comparing each case the firm had during this period, and analyze whether the immigrant who applied for a humanitarian visa was male or female, how old they are, whether they were victims of physical or psychological violence, the relationship they had to their perpetuator, whether criminal charges were brought, and who referred them to the firm. The overall goal of this study is to compare and contrast these specific characteristics that left these immigrants vulnerable to being victims of crime. By comparing this data, I hope to be able to use a subaltern perspective. A perspective that belongs to the population that are socially, politically, and geographically outside the power structure. I also hope to be able to help immigration firms reach out to a larger portion of the Latino community with my findings and discoveries of why some clients are denied visas, or choose to close their case with the firm.

248. Sanchez, Sarah

Characterization of ER and NF-kB activated by ER+ Cells

Undergraduate - Physiology and Biophysics
Breast cancer is the most common cancer affecting women in the United States, composing almost 25% of cancers affecting women worldwide. The risk of being diagnosed with breast cancer increases on account of several factors such as obesity, heavy smoking, and a family history of breast cancer. About 50% of estrogen receptor positive (ER+) tumors will recur and are often more aggressive and resistant to therapy, presenting a major problem in treating the disease. In December 2017, members of the Frasor laboratory found by activating the inhibitor of nuclear factor kappa-B kinase subunit beta (IKKβ) protein in estrogen stimulated ER positive breast cancer cells a dormant metastatic phenotype was induced. IKKβ is part of the nuclear factor kappa-light-chain enhancer of activated B cells signaling (NF-kB) pathway. The focus of this work is characterization of newly developed ER and NF-kB activated cells to confirm the phenotype previously observed and validate previous findings. My hypothesis is NF-kB and ER activation promotes a luminal to basal switch and promotes invasion and metastasis in ER+ breast cancer cells. To test this hypothesis MCF-7 ER+ breast cancer cells were engineered to constitutively express active IKKβ when stimulated with the antibiotic doxycycline. The MCF-7 ER+ breast cancer cells were treated with vehicle, E2 (to activate the estrogen receptor signaling pathway), doxycycline (to stimulate NF-kB signaling) and E2 + doxycycline (to activate both pathways). The cells were characterized through immunofluorescence, western blots, qPCR, and proliferation assays. The results are consistent with the findings of the previous study, suggesting the ER and NF-kB converge to promote a more aggressive phenotype in recurring tumors. The findings of this work can be immediately used to test more cell lines, but also applied to target endocrine resistant tumors, with new approaches in order to prevent them from becoming invasive and metastatic.

249. Schreiber, Jasmine

Colonizing or Coexisting: The Psychosocial and Psychogeographical Implications of Gentrification Efforts in Pilsen

*Undergraduate - Psychology*

This project weaves together the fields of psychology and urban planning to explore the implications of gentrification on community wellbeing and relationships. Focusing on Pilsen - a historically immigrant and working class neighborhood in Chicago, most recently home for many Mexican and Mexican American folks - this research explores how gentrification impacts community members. Studying the sociospatial changes resulting from gentrification efforts, this study observes how changes in Pilsen resulting from gentrification impact the social landscape of the neighborhood. Additionally, this project examines resident emotions and attitudes regarding gentrification in the neighborhood. Eight total Pilsen residents were
interviewed for this study: four newcomers, and four long term residents. The amount of time interviewees lived in Pilsen ranged from just 1 year to 40 years. This study found that most residents in Pilsen, both newcomers and long term residents, have negative attitudes towards gentrification. Interactions between long term residents and newcomers are not common, but when they exist, they do not extend beyond cordial greetings. The shifting geographic landscape of Pilsen seems to facilitate the social separation between newcomers and long term residents. Of interest, there were conflicting attitudes for some newcomers who felt that their presence in Pilsen could be detrimental, but also had desires to stay in the neighborhood. This research argues the importance that aspects of social identity, such as class, gender, and race, have in shaping resident experiences and attitudes in a neighborhood threatened by gentrification.

250. Schwarzman, Logan; Miron-Shatz, Talya; Maki, Katherine; Hsueh, Leon; Liu, Eden; Tarashandegan, Danit; Mendez, Felipe and Vidovich, Mladen

Patient Knowledge of Femoral vs. Radial Cardiac Catheterization Risks and Benefits: A Study of Shared-Decision Making

Shared decision-making (SDM) is a strategy to assist with patient involvement in medical decisions. It improves knowledge and understanding of risks and benefits associated with specific procedures. We studied patient knowledge about transradial (TRA) and transfemoral (TFA) cardiac catheterization. We studied prospectively 100 patients following cardiac catheterization (TRA in 71%). Patients were presented a standard informed consent. Following catheterization, patients were verbally administered an 11-item open-ended questionnaire to assess knowledge of cardiac catheterization and the associated risks and benefits. A patient knowledge index (PKI) was developed - 1 point was given for: identifying the procedure; correctly describing the procedure; identifying at least one risk factor of TRA; and/or TFA; and at least one benefit of TRA; and/or TFA. Maximum PKI score was 6. The mean PKI score was 2.6 ± 1.1. 21% of participants had PKI ≥4 with only 1 patient obtaining 6 points. Over 80% of patients were unable to recall procedure risks provided at the time of informed consent. The majority of patients were unable to discriminate between TRA and TFA risks and benefits, PKI 2.52 vs. 2.60, respectively (p=0.718). Procedure characteristics responses are shown in Figure. Patient retention of information from the informed consent was low. This study identifies challenges with SDM and a need for improved patient education regarding cardiac catheterization.
Patients with Brain Death or Traumatic Brain Injury – Errors in Diagnosis, Prognosis, and Assumptions About Appearances

Undergraduate - Neuroscience/Medical Ethics

Brain death and traumatic brain injury has always been a controversial topic in medicine. This is because there is possibility for the diagnosis of brain death to be questioned. To be able to diagnose brain death, or a loss of function within the brain, a healthcare provider has to follow a strict protocol. This protocol involves a series of tests and evaluations. However, it is not the case that this protocol is always efficacious or accurate in determining brain death. This study's preliminary aim is to draw a comparison between the errors in the determination factors of brain death and its accurate diagnosis. In order to do this, it is important to study the methodology followed in locations where high rates of accurate brain death diagnosis exist. Also, it is imperative to assess the confounding factors that would allow error to be involved when viewing both the diagnosis and prognosis of brain death. For example, the urgency of organ donation may play a role in influencing the healthcare provider to make mistakes when dealing with a patient that has a traumatic brain injury. After reviewing components that made a brain death determination protocol effective, it is clear that specific factors are required to have a higher accuracy in correctly determining brain death. These include (1) using more advanced neural read technology when in the process of diagnosing brain death, (2) eradicating the assumptions of brain death – including those influenced by organ donation, and (3) allowing patients with traumatic brain injuries a larger timeframe for recovery.

The Role of Phylogeny in Presence or Absence of Scopolamine in Solanaceous Plants

Undergraduate - Biological Sciences

Tropane alkaloids are some of the most powerful known anticholinergics used in pharmaceuticals, able to inhibit neurological signals transmitted by the endogenous neurotransmitter, acetylcholine. Scopolamine and hyoscyamine are tropane alkaloids used most widely in pharmaceuticals for their effects on the parasympathetic nervous system. Hyoscyamine has a stimulant effect on the central nervous system and heart, while scopolamine has a sedative effect. Analyzing the role of phylogenetic relationships between plants within Solanaceae will allow possible identification of plants that produce hyoscyamine and scopolamine that may be better sources of drug synthesis based on commonality and ease of growth. Many species of Solanaceae are able to produce
hyoscyamine but not scopolamine. H6H (Hyoscyamine-6ß-hydroxylase) is the enzyme that catalyzes the last two steps in the scopolamine biosynthetic pathway from hyoscyamine. When the amount of H6H is limiting, the intermediate between hyoscyamine and scopolamine, 6ß-hydroxyhyoscyamine accumulates. The amount of H6H may limit the rate of accumulation of scopolamine in plants. Mutations may be affecting the amount of H6H enzyme in plants producing hyoscyamine and not scopolamine, indicating the presence or absence of scopolamine are results of independent gains and losses respectively. Additionally, the presence of scopolamine in plants that do not produce scopolamine may be an evolutionary disadvantage. Using phylogenetic relationships of Solanaceous plants to study evolutionary advantages and disadvantages of scopolamine may reveal patterns of valuable secondary metabolites useful for pharmaceuticals, such as scopolamine, in closely-related plants.

253. Serrano, Gabriela

Why Are Older Adults More Physically Active in Spain Compared to Older Adults in the United States

Undergraduate - Kinesiology

There has been countless evidence demonstrating how living a physically active life contributes towards an increased healthspan and lifespan. Physical activity is especially critical among the older adult population, yet in the United States only 16.3% of older adults met the recommended guidelines for physical activity in 2018. In contrast, 68% of older adults in Spain met the recommended guidelines for physical activity in 2018. The purpose of this literature review is to investigate why older adults in Spain are more physically active compared to older adults in the United States. Five main databases were used to find relevant articles containing possible reasons for why older adults in Spain have a higher prevalence of physical activity. It was found that Spain’s integration of the Mediterranean diet is a possible factor towards increased physical activity among older adults as well as efforts from the Spanish government towards creating open, spacious areas for the public to socialize in. These findings may allow for similar efforts to be done in the United States to help the older adult population live more physically active lives which can ultimately lead towards longer healthspans and lifespans.

254. Sevak, Brinda; Maharathi, Biswajit; Geraghty, Joseph; Loeb, Jeffrey and Patton, James

Automatic classification of animal vigilance states using Machine Learning algorithms
Graduate / Professional - Bioengineering

Epileptic electrophysiological events have been observed to be dependent on the circadian rhythms and vigilance states in both humans and animals. It is therefore important to have reliable methods to automatically determine the vigilance state when performing long-term video EEG monitoring. However, manual detection of the different activity states is time consuming and includes human bias. We implemented a machine learning algorithm using a series of frequency band-specific power content in each electrode over the entire brain of rats undergoing epilepsy monitoring. We identified features to automatically determine sleep versus awake states by implementing k-nearest neighborhood (KNN), support vector machine (SVM) and logistic regression-based classification algorithms on 300 hours of continuous video EEG recordings. These were independently, in a blinded fashion, compared to carefully marked manual state detection. Using KNN only in the frontal regions of the rat brain was able to predict the vigilance state of the animals with 94% accuracy. An automated version of this algorithm will be able to detect the vigilance state of animals in real time and significantly improve the interpretation and understanding of epileptic brain abnormalities.

255. Shafi, Namra, Deliu, Zane; Dudek, Edyta; Pereira, Priscila; Veldhuis, Cindy; Arreola, Veronica; Carnahan, Leslie and Maki, Pauline

Development of STEM Identity in 1st year WISE Undergraduate UIC Female Students

Undergraduate - Biological Sciences

There is a significant gender gap in STEM (Science, Technology, Engineering and Mathematics) professions. On average, women obtained only 35.1% of STEM degrees in 2015. Additionally, women made up only 24% of the STEM workforce in 2015. Women seem to experience identity conflict due to gender bias in the STEM field which may influence their decision to pursue STEM education or professions. This project looks at how identity interference can be remedied with interventional programs that help increase identity centrality. In this study, we looked at identity conflict among female UIC students in their identity as a woman and their STEM identity as a scientist or engineer and whether their involvement in WISE (Women in Science and Engineering) organization contributes to identity centrality. We compared women who are STEM majors involved in WISE, and women who are STEM majors and not involved in WISE. Data on identity interference and centrality was collected through electronic surveys. Women who participated in WISE are more confident in their STEM identity and have greater identity centrality. Interventional programs such as WISE can help increase identity
centrality and confidence in pursuing education in STEM fields, which can lead to increases in the number of women in STEM professions.

256. Shah, Pal

**Mitigating Error: A Comparative Analysis on the Impact of Checklist Use on Patient Safety Culture in the United States and Switzerland**

*Undergraduate - Neuroscience*

Since the publication of the report To Err is Human at the turn of the century, the global medical community has become increasingly aware of the impact medical error has on patient outcomes. As a result, a movement to create a culture oriented towards patient safety has become a major priority for healthcare providers. Among the most promising methods to promote patient safety and reduce medical error is to utilize checklists. Various studies have shown that, under the right conditions, checklists have the potential to dramatically reduce the rates of error related incidents in medicine. The purpose of this report is to understand and compare the use of medical checklists in Switzerland and the United States. These two countries were selected because they lead the world in healthcare spending, yet there is a discrepancy between them in quality of care provided. The research was conducted by interviewing experts in the field of quality of care as well as analyzing published primary sources from peer-reviewed journals and government reports. Despite the benefits of checklist intervention, the United States has only made progress in implementing checklist intervention programs at the individual healthcare provider level with the exception of a few states. In contrast, Switzerland has made great progress in the last decade in implementing the use of checklists into their care. Further study is needed to better understand the effectiveness of implementation and the impact of these programs.

257. Shah, Vallari

**A Study of the Size and Function of the Apidaecin Peptide**

*Undergraduate - Biology*

API is a peptide that works by inhibiting protein synthesis by preventing the last step of translation (termination) and trapping the release factors in the ribosome. The research team at the University of Illinois at Chicago discovered with the use of in vitro toeprinting analysis that once a polypeptide leaves the P site from the ribosome tunnel, the API peptide takes this as the opportunity to enter the tunnel. API then binds to the release factor, the ribosome, and any tRNA. With the release factor locked into place by API, the two ribosomal subunits are unable to separate and initiation translation with other coding strands. This terminates protein
synthesis of the cell, not allowing the bacterial cell to carry out normal function, ultimately killing it. The objectives of my project are to discover exactly how short the API peptide can be, and still be able to successfully kill bacterial cells. This data is to be obtained by genetically engineering plasmids with genes producing different sizes of the API peptide. The ending portion of the peptide with the R17 codon will be preserved as it is essential to ribosomal binding. Also, the start codon (Methionine) at the start of the peptide will also be preserved, as it is crucial to begin transcription. Four different constructs API Δ2-3, Δ2-5, Δ2-7, and Δ2-9 are synthesized, with different amounts of codons missing. These constructs will then be incorporated into an empty plasmid with the chloramphenicol resistance gene and transformed into E. coli cells. Finally, the transformed cells of different sized API genes will be exposed to arabinose, initiating the promoter and protein synthesis terminating function of API. With this process, I hope to learn the shortest possible length required by API to still effectively kill bacterial cells.

258. Shah, Zainab

Influence of Maternal Adiposity and Gestational Weight Gain on Perinatal Mental Health in an Urban Population

Undergraduate - Psychiatry

Maternal health, both physiological and psychological, can have lasting effects on the mother and offspring. Approximately 10-20% of women experience mental illness during pregnancy or during the first 12 months postpartum, however fewer than 24% of these women are diagnosed. Depression or anxiety during and immediately after pregnancy confers significant risks to both mother and child, including immediate risks of low birth weight and preterm birth, and subsequent risks of stunted growth, altered stress response, poor temperament, compromised mother/child interactions, and externalizing disorders. This study focuses on the interaction between perinatal maternal adiposity and the development of depression or anxiety during pregnancy and post-partum period (12 months post-pregnancy). Mental health data was collected from 300 pregnant women served here at the University of Illinois Hospital and Health Sciences System (UIHHSS) in order to understand the prevalence of perinatal depression and anxiety. The majority of these women are low-income, minorities (45.5% non-Hispanic blacks, 37.4% Hispanic). The purpose of this study was to examine the extent to which maternal depression and anxiety and maternal weight trends (i.e., pre-pregnancy body mass index (BMI), incident BMI, and gestational weight gain (GWG)) are associated during early and late pregnancy. It was concluded that weight loss between 3T and PP visits was associated with CAT-DI, CAD-MDD, as well as CAT-Anxiety. There were also significant protective effects of education against
perinatal and postpartum depression and anxiety. No significant relationship was observed between pre-pregnancy BMI, first, second, or third trimester adiposity or GWG and early or late pregnancy mood. Understanding the interaction between maternal adiposity and mental health can broaden the understanding of inter-conception weight loss (or gain), and emphasize the importance of adequate conversations between physicians with their patients regarding gestational weight gain during pregnancy as well as preventive measures/interventions to ensure a healthy pregnancy.

259. Shaikh, Hiba and Mathew, Mathew

New Perspectives on Biomaterials and Additive Manufacturing in Dentistry: A Review

Undergraduate - Restorative Dentistry

The development of effective and versatile techniques for additive manufacturing, also known as 3D printing, marks an important paradigm shift in manufacturing. This shift has created the possibility for mass customization of medical devices, which marks a step towards truly personalized medicine. No sector serves to benefit more from this paradigm shift than healthcare, where the success of an entire industry is predicated upon applying general treatment options to individual cases in the most effective way possible. As the role of technology within the healthcare industry expands, especially in clinical and research settings, the dynamic between healthcare professionals and their tools appears to be changing. In dentistry specifically, additive manufacturing methods have been used to create implants, prosthetics, dental tools, drug-delivery systems, and much more. An assessment of the state of biomaterials and their relation to additive manufacturing practices can inform predictions about the future of this technology by outlining constraints that will guide innovation. This review offers a comprehensive analysis of the seven major categories of 3D-printing methods (vat photopolymerization, material jetting, binder jetting, material extrusion, powder bed fusion, sheet lamination, and directed energy deposition), as defined by the American Society for Testing and Materials group (ASTM). Functional descriptions and current applications of each method are included, and appropriate future applications are discussed based on foreseeable benefits and potential drawbacks. The development and usage of biomaterials for these methods is also examined, all of which informs a final interpretation of the future of additive manufacturing in dentistry. Keywords: 3D printing, Implants

260. Shaw, Summer
Preah Khan of Kompong Svay (Preah Khan), located in north-central Cambodia, is one of the largest and most enigmatic sites of the Angkorian Khmer Empire (9th to 15th c. CE). Unlike other Angkorian era sites dedicated to Hinduism, Preah Khan appears to have been established and remained a Buddhist site from the 10th to 13th centuries (Jacques 2007). One of the most iconic elements of the site are the elaborately carved lintels above the doorways depicting five seated Buddhas (See Fig. 1). Hendrickson’s recent inspection suggests that many of these figures are not the originally intended image but were re-carved (See Fig. 2 and 3), perhaps due to the 13th century Hindu iconoclasm or a repurposing of the imagery during the 14th century transition from Mahayana to Theravada Buddhism (Hendrickson 2015). Preliminary analysis using 3-D photogrammetry software of hundreds of photographs indicate re-carving of some lintels at Preah Khan (Fischer and Hendrickson 2017). The results will suggest probability of lintel modification that will help portray the scope of transformation and the artistic skills of the carvers during the time of Angkor’s slow decline. This project tests probability of lintel modification by measuring variation in specific diagnostic features within the arches and figures, designated as the two main parts of the lintel in this project. It is assumed that variation will increase with modification and while the figures were modified, the arches were not. This study aims to bridge the gap in knowledge of the religious transitions at the site of Preah Khan of Kompong Svay through analysis of lintel modification. The results of the modification and its standardization help us understand the scope of transformation and the artistic skills of the carvers during the time of Angkor’s slow decline.

261. Sinha, Garima; Viana, Grace and Galang-Boquiren, Maria Therese

Fostering Interprofessional Collaboration in an Advanced Dental Education Program

Objective / Professional - Orthodontics

Objective: The purpose of this study was to assess the interdisciplinary areas involved in the masters theses in the Department of Orthodontics towards the Master of Science (M.S.) in Oral Sciences degree conferred by the Graduate College at the University of Illinois at Chicago (UIC). Methods: All M.S. in Oral Sciences thesis in the Department of Orthodontics from the year 2000 through 2018 were evaluated and the following specific descriptive data were collected: author gender, graduation year, type of research study and interdisciplinary collaboration information. Results: Based on descriptive statistics findings, out of
164 thesis available for this study, Restorative Dentistry is the most common collaborating department, followed by Oral Biology and Pediatric Dentistry. Conclusion: Throughout the past 19 years, the Department of Orthodontics requirement of involving an external (outside the department) thesis committee member resulted in productive outcomes in which Restorative Dentistry was the most common area of interdisciplinary collaboration.

262. Sipek, Kirsten; Gustafson, Jonathan; McCarthy, Stephanie; Hall, Deborah; Lundberg, Hannah; Levine, Brett and Pourzal, Robin

Surgical Impaction Force During Total Hip Arthroplasty: Effect Of Material And Experience Level

Graduate / Professional - Bioengineering

Total hip arthroplasty (THA) is a commonly performed procedure to relieve arthritis or traumatic injury. However, implant failure can occur from loosening or crevice corrosion as a result of inadequate seating during implantation. It is unclear if the material choice—metal or ceramic—can affect the assembly force applied by the surgeon while considering their experience level. The objective of this study was to evaluate the differences in surgical assembly force considering two materials—metal and ceramic heads—while ascertaining the effects of surgeon experience to implant assembly. A total of 28 surgeons of varying levels (Attending, Fellow, Resident) were recruited and asked to perform a benchtop, modular taper assembly simulating an operating room procedure. The apparatus comprised of a 12/14 stem taper attached to a 3-dimensional force sensor (9347C, Kistler® USA, Amherst, NY). Surgeons were randomly assigned a metal or ceramic femoral head and instructed to assemble the taper using their preferred technique. This procedure was repeated five times. Surgeons were brought back to test the opposite material after four weeks. Preliminary results suggest no significant differences between the forces applied to metal and ceramic heads. Attendings applied the greatest force (8.5 kN; Fellow=7.1 kN; Resident=8.4 kN) regardless of material and exhibited the lowest variability among the different surgeon groups. Attending surgeons also applied their force with the smallest off-axis angle (4.9° vs Fellow=7.3° vs Resident=5.3°). Lastly, the impaction force plots suggest that the first impact strike is the most crucial for head stability. Differences in impaction force when assembling metal and ceramic femoral heads were not apparent; however, significant variability of technique and force was observed across the different experience levels and within surgeons of the same level. Understanding assembly mechanics and surgical habits for THA will provide insight to the best assembly procedures.
263. Solovieva, Uliana and Passarotti, Alessandra

What does your face tell me? An adolescent perspective.

Undergraduate - Psychology

Previous research has indicated that emotional regulation and face emotion recognition are strongly related and key to emotional intelligence. Moreover, development of these skills continues until late adolescence. We examined the relation between emotional regulation and facial emotion recognition in adolescents. Fifteen adolescents, ages 14-18 (M=15.4; SD=1.6) completed the BRIEF Emotion Regulation Questionnaire and the Facial Emotion Recognition Test (PenER40) - a computerized test of emotion perception. We posited that adolescents would be less accurate and slower when identifying neutral and mild face emotions compared to negative and extreme emotions. We also predicted that false positives for negative expressions will correlate with emotional dysregulation. T-test and correlation results are summarized below. Adolescents were significantly less accurate when detecting anger (M=64%; SD=16) as compared to neutral (M=94%; SD=6) and the rest of emotions (All Ps < .05). Further, adolescents had the fastest RT for happy faces (M=1700.97; SD=279.97) relative to neutral faces (M=2042.33; SD=408.4), and the other emotions (all Ps < .05). We also found greater accuracy for extreme expressions (M=90%; SD=7) than for mild expressions (M=81%; SD=10). Lastly, we found a positive correlation between percent of “neutral” false positives in the actual presence of negative emotions (anger, fear, sadness) and impairment on the Behavior Regulation subscale of the BRIEF (M=33.2; SD=5.35), p<.05. The present findings suggest that during a face emotion task adolescents find it more difficult to correctly recognize mild as compared to extreme facial expressions, and angry faces compared to neutral faces. Our correlation results suggest that inaccurate misattribution of negative expressions is correlated with impaired emotional regulation. Further research on the causal relationship between emotional regulation and emotional recognition is needed in developmental studies.

264. Sowemimo, David; Jana, Braese and Eustaquio, Alessandra

Molecular basis for the Different Diazaquinomycin Analogs Produced by Marine and Freshwater Actinomycete

Undergraduate - Medicinal Chemistry and Pharmacognosy and Center for Biomolecular Science
The increasing number of drug-resistant Mycobacterium tuberculosis highlights the importance and the clinical need for new antibiotics. According to the World Health Organization, tuberculosis remains a global health problem accounting for 1.7 million deaths and 10.4 million new cases in 2016. Recent studies have shown that DAQs, an antibiotic compound, have potent and selective inhibitory activity against M. tuberculosis. Although, the structures and bioactivity of DAQs are well studied, their biosynthesis remains unknown. This project is focused on the synthesis of diazaquinomycin analogs by examining bacteria strains F001 and B006. While DAQs have identical three fuse center rings in all analogues, the interest of this project is focusing on the synthesis of the substrate required for the production of DAQs side chains. It was proposed that daqC gene encodes a putative long-chain acyl-CoA synthetase. Then, it was hypothesized that DaqC synthesizes acyl-CoA which would be used as substrate for the side chains of the different DAQs Analogs. The aim of this project is to determine the substrate specificity of DaqC from strains F001 and B006 in vitro. This hypothesis was tested by amplifying the daqC and using the protein product recovered for synthesis of substrate in vitro. The obtained PCR products from amplification of daqC was purified and ligated into an expression vector pHIS8. Afterwards, the plasmids were confirmed by restriction digest and Sanger sequencing, and then transferred into E. coli BL21 (DE3) by transformation. The protein was purified using protein purification techniques, and the final step is in progress. The samples will be analyzed by High Pressure Liquid Chromatography (HPLC) and LC/MS. The products will be identified using standards and/or by mass.

265. Spegar, Milen; Geraghty, Joseph R; Lara-Angulo, Melissa; Tate, Alexander and Testai, Fernando D

Patients with Aneurysmal Subarachnoid Hemorrhage Demonstrate Cognitive Decline Regardless of Their Functional Outcome

Undergraduate - Neurology and Rehabilitation

Aneurysmal subarachnoid hemorrhage (aSAH) is a type of stroke with high fatality and disability rates. aSAH causes severe cognitive decline that affects memory, language, and reasoning. Compared to ischemic strokes, aSAH affects younger individuals, forcing them to leave their jobs and negatively affecting quality of life. We investigated the degree of cognitive impairment in aSAH using a validated neuropsychiatric test called the Montreal Cognitive Assessment (MoCA). We administered the MoCA to UI Health patients who fell under three categories: aSAH, ischemic stroke, or hospitalized controls. We hypothesized that even amongst low-grade aSAH patients who were expected to have better functional outcomes, there would still be increased rates of cognitive impairment compared to
hospitalized controls. Variables collected included sex, age, race, level of education, initial severity scores (Hunt-Hess Grade; Fisher Grade; Glasgow Coma Scale, GCS), functional outcome (modified Rankin Scale, mRS), and cognitive outcome (MoCA). Demographics were similar for each group, except for age which was higher in ischemic stroke patients compared to aSAH and controls. MoCA scores for aSAH patients were similar to ischemic strokes but lower than the control group. Patients with higher Hunt-Hess or Fisher Grade on admission also had significantly lower MoCA scores at time of discharge. Furthermore, aSAH patients with good functional outcome still had significant cognitive impairment. Since clinical settings currently screen for motor and functional deficits, these results show that even patients with low-grade aSAH who show good functional outcome need proper cognitive assessments to accurately reflect cognitive decline. Future studies will attempt to explore the effects of blood products in vitro on neurons in order to further characterize the effect aSAH has on neurons. Overall, this study suggests the need to increase cognitive screening in all aSAH patients regardless of initial severity and functional outcome.

266. Stamps, Marla

Restorative Practice in CPS Schools

Undergraduate - Gender and Women Studies

The implementation of zero-tolerance policies has made the distinction between schools and prisons unclear. The policy was intended to create safe environments for students attending school. Instead, studies have shown that it has not. With the increase of schools' reliance on law enforcement to handle disciplinary actions, students are more likely to be funneled into the criminal justice system. In addition, students of color are disproportionately affected by the disciplinary policies for minor behavioral infractions. With the emergence of restorative practice, which is an alternative method to disciplinary policies, schools use meditation methods to solve infractions. Although there is a push to disband or reduce the criminalization of students of color, there is an increase of exclusionary practices within schools such as in-school-suspensions.

267. Stymacks, Jeremiah

Semiprime Factorization using the recursive Sum of Digits function

Undergraduate - Computer Engineering
The strength of Rivest–Shamir–Adleman (RSA) encryption is derived from the computational difficulty of factoring a sufficiently large odd semiprime (S). Within public-key cryptography, these two odd prime factors of S become the public and private keys to unlock S. Attempting to divide S by every prime up to \( \sqrt{S} \) is known as Brute Force. The weakness of Brute Force comes from repeating the computationally expensive process of division. Performing long division by every possible prime is so taxing in latency, that runtimes of Brute Force can eclipse the span of a human lifetime. As an alternative, we propose a method that factors S without using division. Our method utilizes the relationship between Sum of Digits (SOD) value for S and the distribution of SODs of every possible pair of prime keys. The method rules out certain key-pairs whose SODs are arithmetically inconsistent with the SOD of S. By eliminating non-conforming pairs, the list of all possible key-pairs is reduced by up to 85%. Furthermore, SOD pairings in different number bases reveal different information about the keys of S. Thus, the list of possible key-pairs of S can be pruned many times, eliminating pairs with nonconforming SODs in various bases. Eventually, the list is reduced to only one possible pair, the keys of S. Augmenting the list of primes used in Brute Force to also contain SODs requires a one-time overhead processing step, followed with management of a larger file size. Ultimately, compared to Brute Force, using SODs makes a tradeoff of memory space for factoring speed. The proof of concept programming files uses 64-bit Python and is still being developed for optimization.

268. Sudhakar, Deepshika; Geraghty, Joseph R.; Senador, Danielle and Loeb, Jeffrey A.

Site of Tetanus Toxin Injection in the Rodent Model of Neocortical Epilepsy Results in Opposing Epileptic and Behavioral Phenotypes

Undergraduate - Neurology and Rehabilitation

Epilepsy is characterized by hypersynchronous firing of large populations of neurons which can be detected by electroencephalogram (EEG). Epilepsy is known to have common psychiatric comorbidities and is characterized by both seizures and spiking activity. Other conditions, such as attention-deficit hyperactivity disorder, may have spiking activity alone. The relationship between behavioral abnormalities and epileptic-like activity in the brain is unknown. We hypothesize that animals with higher rates of spiking activity will exhibit higher rates of behavioral abnormalities. To identify the relationship between epileptic activity and behavior at different origins of epileptic foci, tetanus toxin (TTx) was injected in either the rat motor (MC) or somatosensory cortex (SC). Sham-surgery with saline injection and surgery-naive rats were also used as control animals. Video EEG recordings were performed and analyzed for abnormal events including interictal spikes and seizures. A one-hour open field test was used to study activity
levels. Parameters analyzed included ambulatory distance, average velocity, counterclockwise revolutions, resting time, stereotypic time, vertical counts, and jump counts. Ambulatory distance data indicate that MC-injected animals travelled less distance than SC-injected and control animals; SC-injected animals travelled statistically significantly more distance than MC, sham, and naive groups [MC vs. SC (p<0.0001), SC vs. Sham (p=0.0012), and SC vs. Naïve (p=0.0364)]. Comparison of counterclockwise revolutions also indicated that SC-injected animals performed statistically significantly more counterclockwise rotations than MC-injected, sham, and naive animals (p=0.002). This data indicates that SC-injected animals with predominant spikes but not seizures exhibit hyperactive behavioral features, while MC-injected animals with both spikes and seizures exhibit hypoactive features. Future studies will focus on exploring the histologic changes in the MC vs. SC rodent brain, including areas of microglial activation and synaptic loss. By understanding the relationship between EEG changes and behavior, we hope to better understand the pathogenesis of both neurologic and psychiatric disease.

269. Suh, Ine; Li, Wei and Wu, Christine D.

The Effect of Cranberry Juice on the Regrowth and Glycolysis of Human Supragingival Plaque

Undergraduate - Pediatric Dentistry

Background: In the oral cavity, supragingival and subgingival dental plaque is the etiologic agent in dental caries and periodontal diseases. The anti-adhesion and antimicrobial activities of polyphenols like proanthocyanidins in the American cranberry (Vaccinium macrocarpon) have been shown to prevent biofilm formation of cariogenic bacteria. Wu's laboratory reported that cranberry juice inhibited oral pathogens and that consuming dried cranberries reduced the bacteria level in children’s saliva. Objectives: The aim of the study was to evaluate how short-term rinsing with 100% cranberry juice differs from 27% cranberry juice in affecting the regrowth and acid production of human supragingival plaque. Methods: Dental plaque on tooth surfaces of the left half of the mouth was collected for pre-treatment samples and from the right half of the mouth for post-treatment samples. The plaque glycolysis of each treatment was evaluated by a pH meter at 2-hour intervals, while the amount of plaque was assessed by measuring the optic density. Results: 100% cranberry juice was most effective in reducing the acid production and regrowth of plaque bacteria compared to 27% cranberry juice or water. Conclusion: 100% cranberry juice appears to be effective in inhibiting the growth of human supragingival plaque.
270. Sulkar, Reena; Chan, Alessandro; Ricarte-Filho, Julio and Hulbert, Alicia

The Influence of Race on Epigenetic Biomarkers for NSCLC Diagnosis

*Undergraduate - Cancer Center/Surgery*

Many strides have been made in the field of diagnostic oncology in the past several decades, with lung cancer mortality rates dropping 27% over the past 25 years. The decrease in mortality stems largely from the advent of diagnostic technology that is allowing for earlier diagnoses. However, significant racial health disparities exist in the field of oncology. In regard to lung cancer, African Americans males have the highest incidence and mortality rates of any other racial demographic in the United States. In order to combat such differential mortality rates and prevent unequal access to breakthrough medical advances, it is necessary to develop personalized diagnostic methods for different patient demographics or ensure that those diagnostic tests employed are universally applicable to all patients. Therefore, it is important to conduct research to ascertain whether new diagnostic methods, such as the analysis of the methylation status of the validated gene panel CD01, TAC1, HOXA7, HOXA9, SOX17, and ZPF42 for non-small cell lung cancer (NSCLC) detection, have clinical significance for different races before being widely implemented in clinical practice. The results of this study demonstrate that analyzing methylation signatures of the validated panel of six genes has diagnostic efficacy in detecting NSCLC for both African Americans and Caucasians. Such suggests that the panel, which cites lower costs and higher specificity values than currently implemented diagnostic methods, may be of considerable diagnostic value for different racial demographics in clinical practice.

271. Sun, Mitchell; Atwal, Gurdeep; Sun, Ying; Chen, Jiwang and Komarova, Yulia

Microtubule-Associated Protein EB3 Contributes to Pathogenesis of Pulmonary Arterial Hypertension through Regulation of HIF Nuclear Translocation

*Undergraduate - Pharmacology*

Background: Stabilization and consequent translocation of hypoxia inducible factors (HIFs) from the cytoplasm to nucleus in endothelial cells (ECs) plays a critical role in the pathogenesis of pulmonary arterial hypertension (PAH). The microtubule (MT) cytoskeleton acts as ‘tracks’ for movement of organelles and molecules in retrograde and anterograde fashion. End Binding (EB) protein 3, which binds only growing MT plus ends, promotes MT growth as well as controls MT interaction with intracellular structures. We tested the role of EB3 in
pathogenesis of PAH through stabilization and/or nuclear translocation of HIFs in pulmonary arterial endothelial cells. Methods: We developed inducible cell-type specific Knock Out (i-KO) mouse models for ubiquitous deletion of EB3 in endothelial (iEC) or smooth muscle cells (iSM) by crossing mapre3floxflox to Tie2-CreERT2 or SMMHC-CreERT2 respectively. After 4 weeks of 10% oxygen hypoxia, PAH was assessed by measuring heart dilation and ventricular hypertrophy (echocardiography), right systolic ventricular pressure (RSVP) through jugular vein catheterization, and arterial wall thickness for small and medium size vessels on histopathological sections. We also used immunofluorescent staining of lung tissue and human pulmonary arterial endothelial (HPAE) cells for HIF2α to test the effect of EB3 on HIF2α nuclear translocation. Results: After hypoxia, both EB3 flox/flox (control) and iSM-KO demonstrated an increase in RSVP with no significant difference between the groups. In contrast, RSVP increase was significantly mitigated in EB3 iEC-KO. This was consistent with lesser wall thickening and decreased nuclear HIF2α localization. Silencing EB3 in HPAECs significantly inhibited stabilization and nuclear translocation of HIF2α A530T (gain-of-function mutation) under normoxia, indicating that EB3 contributes to HIFs signaling. Conclusion: Our data demonstrate that EB3 plays an important cell-specific role in pathogenesis of hypoxia-induced PAH and is a potential therapeutic target to limiting HIF signaling associated with environmental or intracellular hypoxic stress.

272. Taylor, Natalie

The Link Between Children's Oral Healthcare Habits and the Development of Oral Disease

Undergraduate - Biological Sciences

The purpose of this project was to identify behaviors or lifestyle factors that increase a child’s likelihood of developing oral diseases. This was investigated by gathering data from patients at the UIC College of Dentistry pediatric clinic through an anonymous survey. The surveys were completed by the patients' parents or guardians to assess their child's oral healthcare habits. The survey included questions about the patients' frequency of brushing and dentist visits as well as diet choices. The data collected through the surveys were analyzed for any apparent patterns from a small sample size of patients. The data collected provided insight into the overall risk of developing oral diseases for the patients surveyed based on the American Academy of Pediatric Dentistry risk assessment guidelines.

273. Telagi, Parnika; Haut, Kristen M.; Dodell-Feder, David; Saxena, Abhishek; Pridgen, Sarah; Galindo, Briana and Hooker, Christine I.
Examination of Empathic Accuracy and Social Functioning Across Phases of Psychosis

*Undergraduate - Psychology*

Empathy, the ability to understand and share the subjective emotional states of others, is crucial for social functioning and relationships between individuals. Current research suggests that empathy is impaired in individuals with schizophrenia. This study aims to compare the empathic accuracy of individuals at clinical high risk for psychosis and individuals with schizophrenia to controls, in addition to analyzing the relationship between one’s self-perception of empathy and their empathic accuracy. This study included 45 healthy controls, 70 individuals determined to be at a clinical high-risk for psychosis (CHR), and 78 individuals with a diagnosis of a schizophrenia-spectrum disorder (SCZ). Subjects completed an empathic accuracy task where they were asked to make inferences about the naturalistically occurring emotions of individuals as they recalled autobiographical events. Subjects continuously rated what they thought the emotions of the individuals recalling the events were and were then scored for accuracy using the target’s self-reported feelings. ANOVA showed a significant group difference (F=21.56, p <0.01) in overall empathic accuracy performance between the three groups. The average correlation for the SCZ group was 0.61, CHR group was 0.85, and control group was 0.87. In addition, each participant was given a Social Functioning Score from a clinician based on a series of related questions. The relationship between the Social Functioning Score and the empathic accuracy indicated that there is a trend to significance for the CHR group, but no significant correlation for the SCZ group. Individuals with schizophrenia have significant impairment on empathic accuracy. CHR individuals did not show any impairment compared to the healthy control sample, suggesting that impairments on empathic accuracy may become apparent after the onset of the disorder. The relationship between audio tone recognition and facial emotion recognition to one’s empathic accuracy were also analyzed in this study.

274. Tran, Sophie; Mathew, Biji; Chennakesavalu, Mohansrinivas; Torres, Leianne; Patel, Raj and Roth, Steven

**Involvement of Autophagy in Retinal Ischemia**

*Undergraduate - Anesthesiology*

Introduction: Retinal ischemia is a major cause of vision impairment and a common underlying mechanism associated with diseases such as diabetic retinopathy. We have previously demonstrated retinal neuroprotection induced by post-conditioning (post-C), a brief period of ischemia 24 h following prolonged and damaging initial ischemia, however, the underlying mechanisms are mostly uncharacterized. In this
study, we hypothesized that autophagy, a cellular recycling mechanism activated under low-level stress conditions, is triggered by Post-C and is essential for Post-C induced retinal neuroprotection from ischemia. The goal is to understand the mechanistic interplay between autophagy and apoptosis together orchestrating the functional recovery from ischemia. A qPCR array was used to identify the key genes involved by analyzing differential expression. **Methods:** We used an in vivo rat model of retinal ischemia and Post-C. Rats were subjected to retinal ischemia by applying elevated intraocular pressure in the eye for 60 min. The Post-C group received an additional 5 min ischemia 24 h after the initial ischemia. Retinal RNA was isolated 24 h after Post-C. We performed a qPCR array on a custom autophagy and apoptosis genes panel. **Results:** ATG5, Caspases 3 and 7, and CD40lg were significantly up regulated with Post-C added to ischemia vs ischemia alone while DFFA was significantly down regulated. **Discussion:** An increase in ATG5, a key gene in initiation and prolongation of autophagy, suggests Post-C enhances autophagy via transcriptional control. CD40lg is an anti-inflammatory gene while Caspases 3 and 7, and DFFA are involved in apoptosis. DFFA is the substrate for Caspase-3 and triggers DNA fragmentation during apoptosis. In conclusion, our results demonstrate the involvement of autophagy and apoptosis genes in Post-C induced ischemic neuroprotection. Post-C invokes a low level of apoptosis-regulated gene expression. A future study will investigate whether this causes autophagy to turn on reciprocally.

275. Tsakos, Anna Maria

**Educational outcomes in Chicago: a Cohesive policy proposal to combat unequal educational opportunities in Chicago and an Analysis of Lori Lightfoot’s Education Platform**

*Undergraduate - Political science*

In our recent mayoral election, the Chicago Public School (CPS) system has been heavily criticized. Each candidate has proposed new legislation and policy to combat the detriments of CPS. Chicago parents, residents, and students are concerned that the quality of education is declining in Chicago and those in power are beginning to address the problem. With the mayoral inauguration approaching, Chicagoans are hopeful that there will be change. This research will analyze the failures of CPS, identify their causes, and propose a policy proposal that would focus on forming an educational coalition and passing a city ordinance. It will also review board decisions made by the Chicago Board of Education and Local School Council’s in order to analyze how these decisions are impairing the educational opportunities of students in Chicago. Furthermore, it will shed light on the increasingly high amount of Level 2 or Level 3 schools as you progress to neighborhoods further South in Chicago and address the mental, physical, and
emotional effects students experience while attending Level 2 or Level 3 schools. And, the detriment of school closings. In addition to these functions, this paper will also analyze mayoral candidate, Lori Lightfoot's, education policy with the intent to assess its applicability to our current public education system.

276. Turner, James and Stahl, Tomas

Antecedents of Moralized Rationality and Importance of Rationality

Undergraduate - Psychology

Individuals who score high on the Moralized Rationality Scale (MRS) have been shown to judge irrational acts as immoral and to be motivated to donate money to charities that fight the spread of irrational beliefs (Stahl, Zaal, and Skitka 2016). High scores on the IRS as well an analytical cognitive style have been associated with fewer unfounded beliefs. For those who did not value rationality (low scores on the IRS), cognitive style was unrelated to unfounded beliefs (Stahl, and Van Prooijen 2018). Because scores on the MRS and IRS have important and distinct cognitive and interpersonal consequences, it is important to understand where these values come from. In the present research, we examine if they are related to distinct personality dimensions. Two studies are reported here which show associations between personality traits (and aspects) and the MRS and the IRS. Study 1 was conducted on MTurk where participants first completed the MRS and IRS, then, the Big Five Aspect inventories (DeYoung, Quilty, and Peterson 2007). Study 2 was conducted on PSCH 100 students in a laboratory setting. The procedure for this study was the same as Study 1. In study 1 we show that Agreeableness is negatively associated with the MRS. We also show that Openness is positively associated with both the MRS and the IRS. Results of Study 2 replicated all of these findings. Thus, it appears that having low Agreeableness may be a key factor in explaining why some people view rationality as a moral issue, whereas others only view it as personally important. Finding these patterns in two substantially different samples suggests that these associations are robust across different segments of the U.S. population. However, future studies, using longitudinal and experimental designs are needed to establish the causal connections between personality dimensions and these values.

277. Udoetuk, Stella; Moody, Dyese; Polikanov, Yury; Batool, Zahra and Chen, Chih-Wei

Unveiling the Structure of β-Alanine Derivative of Chloramphenicol Bound to the Peptidyl Transferase Center
Chloramphenicol (CHL) is a common antibiotic that is known to block protein synthesis in bacteria by binding to the peptidyl transferase center (PTC) of the 70S ribosome. By specifically binding to A2451 and A2452 residues in the 23S rRNA of the 50S ribosomal subunit, CHL prohibits peptide bond formation during protein biosynthesis. However, medicinal applications of CHL have significantly reduced since its discovery in 1947. This is particularly due to the fact that many of the pathogenic bacteria are now resistant to this drug. Previous structural studies have determined that several amino-acid derivatives of CHL bind to the PTC in a way that is unique and different from the parent compound CHL. A derivative of CHL that carries β-alanyl moiety instead of dichloroacetic group is of particular interest because, unlike other amino-acid derivatives, it efficiently inhibits translation and, at the same time, represents is chemically distinct from other PTC inhibitors. This study focuses on determining the X-ray crystal structure of the β-Ala-CAM compound bound to the PTC of the 70S ribosome from thermophilic bacterium Thermus thermophilus.

278. Uribe, Viviana

**Barriers Undocumented Women Face in Mental Healthcare**

*Undergraduate - Psychology*

My capstone topic is what barriers undocumented women face when seeking treatment for their mental health. This might contribute to the knowledge I am interested in because I am majoring in Psychology and minoring in Gender and Women studies and Latino studies. A survey will be administered to the Coalition for Immigrant Mental Health in the Redcap online survey program. I expect to find there are financial issues as to why they cannot always seek help from clinical psychologists. There also might be a stigma around mental health in their culture making it seem embarrassing to seek professional help. I also want to find out if language is a barrier and if there is a good amount of bilingual therapists. Discovering the quality of treatment these women receive is essential and if they are running into any issues and difficulty with continuing their treatment. My thesis would be undocumented women often face barriers when seeking mental health treatment but also face some barriers once receiving the treatment because of the cost, language barrier, and stigma. My project would speak to past mental health care reforms and policies and possibly help create new and more efficient way of treating mental health by pointing out the issues with the current status quo.

279. Vallesteros, Renzmark
**Stretches within the Truth: a Cross Examination between Research, Professional, and Public Perceptions on Stretching**

*Undergraduate - Kinesiology*

Often before a bout of physical activity, people stretch their muscles for potential benefits, such as injury prevention and performance enhancement. However, formulating the best stretching protocol has left fitness researchers experimenting and debating amongst themselves. This presentation aims to reach a consensus between various, recent (2011-2015) studies that will be cross-examined, all in the context of stretching, with the perceptions of the general populace as well as fitness professionals. A total of 208 respondents from the public and 15-20 professionals anonymously volunteered to fill out survey questions respective to their backgrounds. The analysis of each survey was cross-examined between each other and with a literature review of the research. Like with other kinds of breakthroughs, discoveries made in stretching research will mean nothing if they remain disconnected from everyone else. Sparking more interest in confirming and amending potential disconnects within the 3 parties lies as a core objective of this project as other fields continue to update their own knowledge bases with every passing year.

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**280. Varughese, Peter; Colina, Jose and Burdette, Joanna**

**Loss of PAX2 Potentiates the Fallopian Tube Epithelium for Transformation**

*Undergraduate - Pharmacy*

It is estimated that ovarian cancer will be the cause of death of 14,070 women within the year. The most lethal sub-type of this disease is high grade serous carcinoma (HGSC). It is accepted in the field, that HGSC tends to originate in the fallopian tube epithelium (FTE) and there is substantial evidence that it arises from pre-cancerous secretory cell outgrowths (SCOUT). One common factor between HGSC and SCOUTs is a loss of a transcription factor called PAX2. The goal of this study is to understand the role loss of PAX2 expression has on the development and progression of SCOUTs. Preliminary RNA sequencing (RNAseq) of PAX2shRNA knockdown and PAX2 CRISPR knockout murine oviductial epithelial (MOE) cells revealed significant changes to the transcriptome the of human SCOUT samples. One such potentiating alteration that was found was an increase in estrogen receptor mediated signaling. A comparison between the RNA seq of our SCOUT model and the RNA seq of healthy MOE cells treated with estrogen showed remarkable overlap. In the present study, we confirmed the increase in hormonal signaling in the MOE SCOUT model with a luciferase assay using the ERE (estrogen responsive element) and PRE (progesterone responsive element).
in the presence and absence of a ligand. Furthermore, we found that our PAX2 deficient cells had higher estrogen receptor and progesterone receptor present, suggesting a possible reason for the increased activity. Our hypothesis is that loss of PAX2 potentiates the FTE for transformation through increased estrogenic signaling. With our newly developed PAX2 deficient murine SCOUT model, we will continue to explore how these pre-malignant lesions are impacted by their aberrant hormonal signaling. We hope this research will open the door to novel therapeutic and preventative avenues for women.

281. Vazquez, Elideth

Exercise Possibly Effective in Delaying Cognitive Decline in Alzheimer's Patients

Undergraduate - Kinesiology

Alzheimer's disease (AD) is the most prevalent type of dementia. As human lifespan continues to rise the disease continues to rise with it. There are specific abnormalities in the brains of people with AD that lead to the diagnosis of the disease. "Tangled bundles within neuron and amyloid plaque between them are common abnormalities in the brains of AD"(Tyndall et al.,2018). The cognitive decline associated with AD is deleterious to the point at which an individual with AD will no longer be able to independently take care of themselves. This review will focus on cognition of older adults diagnosed with AD and the effects of exercise has on the disease. I reviewed journal articles that assess exercise and AD and have come up with a conclusion that exercise is an effective lifestyle change that possibly enhances cognition in those with AD. As the prevalence of AD continues to grow the need for more preventative behaviors, including exercise is crucial.

282. Vergara, Keith; Kim, Janis, MPT; Hafner, Brian, PhD; Sawers, Andrew, PhD, CPO

Low-To-Moderate Associations Between Pain, Socket Comfort, and Balance Ability Exist Among Lower Limb Prosthesis Users.

Undergraduate - Kinesiology

Objective: Evaluate the relationship between pain, socket comfort, balance ability, and a history of falls in lower limb prosthesis (LLP) users.

Design: Cross-sectional study

Setting: Research laboratory
Participants: LLP users with unilateral transtibial, transfemoral, or knee-disarticulation amputation (n=60).

Main Outcome Measures: Pain was assessed using two self-report instruments from the Patient-Reported Outcomes Measurement Information System (PROMIS), the 4-item pain interference instrument, and the 1-item pain intensity instrument. Socket comfort (best, worst, current, and average) was evaluated by administering the self-report Socket Comfort Scale (SCS). Balance ability and fall history were assessed using three performance-based clinical balance tests (i.e., TUG, FSST, NBWT), and self-reported falls over the past 12-months respectively. The Activities-specific Balance Confidence (ABC) scale was also administered to evaluate balance confidence. Associations between pain or socket comfort and balance ability were assessed using Spearman’s rho. Differences in pain interference, pain intensity, or socket comfort between LLP users with and without a history of falls was examined using the Mann-Whitney U-test.

Results: Pain interference and pain intensity scores were negatively correlated with ABC scale scores (rs\leq-.210), while SCS scores were positively correlated with ABC scores ((rs\leq.367). Pain intensity, pain interference, and socket comfort scores were positively correlated (rs\leq.295) with each of the performance-based clinical balance tests. There were no significant differences (p>.202) in pain intensity, pain interference, or socket comfort scores between LLP users with and without a history of falls, regardless of how fallers and non-fallers were classified. The lone exception being a significantly lower “best” SCS (p=.043) among multiple faller versus non-multiple fallers. Conclusion: This cross-sectional study demonstrated that pain and socket comfort have weak to moderate associations with balance ability and balance confidence in LLP users. Furthermore, pain and socket comfort does not appear to differ as a function of fall history among LLP users.

283. Vinueza, Edipson

Cross-Language Interference in Cognate Nouns During English-Spanish Code-Switching

Undergraduate - Biology

This research study focuses on the Voice Onset Times (VOTs) of nouns that have a Spanish origin but are commonly used in English discourse (henceforth common currency nouns), in code-switched Determiner Phrases (DPs). Previous studies have shown that Spanish-English bilinguals produce voiceless stop consonant /t/ with longer VOT values (approaching English range) during the dictation of Spanish cognate nouns compared to non-cognate nouns (Amengual, 2011). Others focus on whether code-switching leads to phonological convergence, but
there have been mixed results. While these studies look at VOTs in cognates and code-switching, none look at cognates in code-switched contexts. To close the gap in the literature, this study will try to find what the VOT values of common currency nouns will be during monolingual speech compared to those at code-switching points. I tested 8 Mexican-American heritage speakers of Spanish. The elicited production task consisted in the subjects having to read aloud a carrier phrase with the target DP in three trials: monolingual for Spanish and English, and a code-switching trial. The DPs were analyzed using PRAAT. A one-way ANOVA showed that there was a significant effect in the difference in the productions of VOTs [F(2, 68)=117.39, p=.000]. A post-hoc comparison using the Tukey HSD test indicated that the mean score of the English VOT M=.0575 (SD=.0153) was significantly different than the mean of Spanish VOTs M=.0194 (SD=.0056), and the mean of code-switching VOTs M=.0189 (SD=.0058). There was no significant difference between the VOTs of the Spanish and the code-switching. These findings indicate that, during code-switching, VOT values are not affected by the English utterance in the determiner phrase. This data supports Baluka and Koops (2015) but does not support Amengual (2011) because the VOTs of the Spanish and the code-switching were significantly different than the English VOTs.

284. Vryhof, Julie

**Contextualizing the Graduation Rates of Students with Disabilities Enrolled at Alternative Schools**

*Graduate / Professional - Disability and Human Development-Disability Studies*

Despite reforms in federal and state laws to address educational inequity, students with disabilities often still underperform their peers across academic outcome measures (i.e., school attendance, academic achievement, grade point average, credit accrual, graduation rates and school drop-out). This issue is particularly pertinent for students with disabilities who have experienced past educational failure in traditional public schools. While both individual and contextual-level factors have been suggested to explain the disparity in these outcomes, there is a dearth of research contextualizing the outcomes of students of color with disabilities in alternative schools. This research study seeks to gain an understanding of the academic outcomes of students of color with disabilities enrolled in an alternative charter network for students who have previously exited traditional public schooling.

In this study, a mixed methods approach will be used in order to critically analyze the academic outcomes of students with disabilities through an investigation of the individual level factors and ecological spheres of influence that affect their educational experiences. A quantitative investigation of the academic outcomes of students with disabilities enrolled in an alternative high school over a period of four
academic years will occur. Outcomes measures will be further examined across
demographic variables such as race, gender, age, disability category and access
to the general education classroom. Logistic regression will also be employed in
order to determine how graduation rates may be affected by demographic and
school performance factors. After quantitative analysis has occurred, a
convenience sample of school stakeholders will be interviewed in order to gain an
understanding of their perspective about the contextual and individual factors that
can act as assets, mediators, and barriers to the academic success of students of
color with disabilities. The implications of the research findings for special
education practice and Disability Studies in Education will be discussed.

285. Waltrich, Nichole

Investigating the Feasibility of a School-Based Yoga Program for Stress
Management at Chicago’s Uplift High School: A Mixed Methods Analysis

*Graduate / Professional - Community Health Sciences*

**Background:** School-Based Yoga Programs (SBYP) have been shown to improve
stress-management and long-term health and wellbeing among urban youth. Yet,
youth are rarely included in SBYP design. Positive Youth Development (PYD)
views young people as agents in maintaining their health and wellbeing. When
employed in program design, PYD is well-supported as an effective strategy to
attain better health outcomes. The School-Based Health Center (SBHC) at
Chicago’s Uplift High School identified a need for wellness programs that support
stress management. **Aims:** The purpose of this study was to explore ways a SBYP
may help students manage stress. Features of PYD were applied through direct
engagement with students to: (1) identify ways students relieve stress, (2) assess
student perceptions about yoga, and (3) ascertain facilitators and barriers to
practicing yoga. Student feedback will inform design of the SBYP. **Methods:**
Mixed-methods surveys were collected upon student-patient intake at Uplift’s
SBHC. Student-patients were later invited to participate in a semi-structured focus
group. Focus group data and qualitative survey responses were analyzed using
inductive thematic content analysis and compared to quantitative survey
responses. **Results:** Current male and female student-patients, aged 14-19,
completed a mixed-methods survey (n=32); focus group participants (n=10), aged
14-17, were recruited. Three major thematic categories emerged: Uplift students
detailed positive and negative coping strategies that warrant need for alternative
stress relief tools; participants perceived yoga as a positive stress relieve tool;
however, participants viewed yoga as a gendered activity and identified several
ways in which SBYPs do not feel feasible. **Conclusion:** The results suggest that
perceptions and gendered understandings of SBYPs may inform acceptance and uptake of a SBYP at Uplift High School.

286. Wardak, Matin

The Relationship of Medical Information Between Patient and Health Care Provider

Undergraduate - Pediatric Dentistry

The objective of this experimental study results in the outcome of the types of relationship between a patient and a healthcare provider such as a physician, nurse and dentist. The general concept and focus of this study is to understand the types of concerns and sensitive information that the patient informs to the healthcare provider. Such information is assessed by the gender, ethnicity, education, income, marital status, family affiliations and population of the family. The collection of data is controlled and entered through an electronic device emphasized as the ‘iPad’ for a brief 20-30-minute survey. The main purpose of this study is to indicate the amount of information that is told to the health care provider by the allowance of the surveys to calculate what the patient is comfortable sharing. Results quantify the outcome of which category of the patients by their determined gender, age, ethnicity, education level, income and marital status show which group of individuals are more comfortable sharing certain types of information. Psychologically, this study will show the relationships of the group of individuals from each race and gender of the types of information they are comfortable releasing more to either a physician, dentist, nurse, or other. The assessment of this study will provide a learning experience to all healthcare providers by focusing more on the group of individuals who don’t share much information. This study allows to reach out and work with more of the group of individuals who are shy of sharing information by allowing them to be comfortable with their healthcare providers and objectively opening up with sensitive information that would assess with their overall health.

287. Weihe, Logan

Effectiveness of Iterative Design in the Development of Interactive Educational Tool for Medical Students to Learn Osteoarthritis Diagnosis Techniques

Graduate / Professional - Biomedical Visualization
This research project focused on the implementation of iterative design methodology and the involvement of users to develop an interactive educational application to teach medical students about how to properly perform diagnostic tests involved in diagnosing the growing burden of Osteoarthritis. This exploration of iterative design and participatory design with a target audience is unusual in the field of biomedical visualization, but could be very beneficial to the field in terms of saving time, money, resources, man power and on top of that producing visualizations that speak to the audience’s wants and needs in a stronger manor. Providing an example within the field of biomedical visualization of the use of cyclical iterative design techniques, audience feedback, and expert evaluation of decision making has the potential to inform other projects dealing with an infinitely large range of case studies within different sectors of visualization. Focusing on a case study dealing with creating an educational tool to help medical students diagnose Osteoarthritis (OA), the researcher developed an application that can eventually be adapted to be used in medical schools and allow users to practice basic musculoskeletal exams on an interactive knee simulator that visualizes internal anatomy. It has the potential to be a beneficial tool to learn about healthy knee anatomy and function, as well as how OA specifically appears and affects the knee joint and movement. The focus on OA may help students understand exactly what to look for in terms of pathology and clinical test results, potentially preparing them for earlier and more concrete diagnoses of OA in their future practices. The methodology presented in the study demonstrates the benefits to testing biomedical visualization stimuli with target audiences early on in the design process to quickly pinpoint areas of misunderstanding and to validate design decisions.

288. Westbrook, Aaron; Desmet, David M. and Grabiner, Mark D.

**Step width does not scale to body size of young adults during treadmill gait**

*Graduate / Professional - Kinesiology and Nutrition*

**Introduction:** Step width, the frontal plane distance between the feet during double support, plays physiological and biomechanical roles during gait. Energetic cost is minimized at a step width of about 12% of leg length, suggesting that step width scales to body size. However, the extent to which step width may scale to body size has not been systematically studied. This study sought to determine the extent to which step width during treadmill walking is associated with frontal plane anthropometric measures. We hypothesized that step width would be significantly correlated to the anthropometric variables thereby justifying further allometric evaluation. **Methods:** 20 healthy adults walked for 20 minutes at a pace of 2.5 mph on a motorized treadmill. Motion capture tracked the positions of reflective markers placed over body landmarks used to compute gait kinematics. The key
kinematic variable was step width and the key frontal plane anthropometric variables were ankle width, hip width and shoulder width. The initial statistical analysis consisted of calculating Pearson correlation coefficients between mean step width during the 20-minute trial and anthropometric variables. **Results:** The analysis revealed that the correlations between step width and the selected anthropometric variables were not significant (range: -0.437-0.225; all p>0.054).

**Discussion:** The failure of step width to demonstrate a meaningful relationship to body size is unexpected and appears to contradict those reporting that the energetic cost of walking is minimized when step width is about 12% of leg length, implicitly indicated a relationship to body height. The between-study discrepancy could reflect differences in treadmill protocols, treadmill designs, and analyses used to compute step width. The extent to which step width scales with body size remains an open question.

289. Win, Morgan; Naba, Alexandra and Bravo-Cordero, Jose J.

**Characterizing SNED1’s effect on tumor cell behavior**

*Undergraduate - Physiology and Biophysics*

Globally, breast cancer is the most commonly diagnosed cancer in women (Bray, Ferlay, Soerjomataram, Siegel, Torre, & Jemal, 2018). If the breast cancer is metastatic, then the 5-year survival rate is 27% (American Cancer Society, 2018). In order to improve these statistics, the diagnosis and treatment of breast cancer needs to be optimized. The Naba lab focuses on the extracellular matrix (ECM) composition of tumors and found the ECM protein SNED1 was secreted by metastatic tumor cells and not secreted by non-metastatic tumors (Naba, Clauser, Lamar, Carr, & Hynes, 2014). The expression of SNED1 had an inverse relationship with the prognosis of breast cancer patients (Naba et al., 2014). Understanding the role of SNED1 in tumor cells versus normal cells is crucial to optimize the diagnosis and prognosis of breast cancer patients. I propose to quantify the movement, speed, and proliferation of tumor cells expressing SNED1 versus tumor cells with SNED1 knocked down through intravital imaging and proliferation assays. If the presence of SNED1 is responsible for a higher chance of metastasis, then the detection of SNED1 could be a promising biomarker for patient prognosis. Prevention is more beneficial than finding a cure, so SNED1’s potential as a biomarker has strong clinical relevance in the fight against breast cancer.
290. Wright, Dorothy

qPCR Analysis & Water Quality Factors Determine Public Health Outcomes at Chicago Park District Beaches

Undergraduate - Public Health Environmental Occupational Health Sciences

The University of Illinois at Chicago's School of Public Health in partnership with the Chicago Park District has performed recreational water testing using qPCR techniques to determine unsafe levels of Enterococci for public health outcomes at Chicago Park District beaches. These analyses were used for the purpose of public health safety notifications when high levels of Enterococci (fecal indicator bacteria, FIB) make it is unsafe to swim. Our lab performed qPCR analysis using the U.S. Environmental Protection Agency (USEPA) Methods 1609 and 1609.1 on samples beach water during the Chicago Park District beach season beginning May Memorial Day weekend to September Labor Day weekend. The data was collected from summers 2016 to 2018 at twenty Chicago Park District beaches. Nine of these beaches were selected and used in this specific research analysis. The purpose of this research is to analyze the data from those nine beaches to reveal significant differences in water quality FIB levels. Our data reveal the presence of Enterococci from mammalian and avian origins (e.g.; humans, dogs, birds). These sources were selected because their presence indicts fecal matter and thus the presence of Enterococci. Some Chicago Park District Beaches may have specific water quality factors which may increase incidents of high FIB levels. Using statistical analysis, the Chi-square test, of these water quality factors we hypothesis that the data will show statistically significant differences among the nine beaches. Water quality factors are the physical characteristics of a beach which may impact the levels of FIB. Examples are length, width, area, slope, beach infrastructures such as a pier or jetty, boat traffic, boat traffic barrier, restrooms, parking lots, and other facilities located directly on the beach.

Keywords: surface water monitoring, beach management, fecal indicator bacteria, quantitative polymerases chain reaction, qPCR

291. Young, Leana

The Sleepless Student: A Closer Look into the School Start Times of High Schools in the United States and How it Affects the Mental and Physical Health of Adolescents

Undergraduate - Honors College

After extensive research on the psychological effects of sleep deprivation on high school students due to early school start times, I have come to the conclusion that beginning school even 30 minutes later can have positive health and academic
effects on these students. Due to high schoolers being adolescents, their sleep schedules are totally different from those of younger children or adults. Because of puberty and chemical changes in their biology, it is more challenging for high school teenagers to fall asleep earlier, as most critics to the later school start time schedule suggests and they also have more responsibilities after school (i.e., sports, clubs, jobs, and homework) that keep them up even later during the night. Throughout my research, I have come across schools that have implemented a later start time schedule and have seen positive results in the process. In this paper, I will analyze this idea further by looking into schools specifically in the Chicago land area and what schools in Illinois are doing to help students with sleep deprivation.

292. Zajac-Clark, Molly

**Comparing and Contrasting Chopin and Gaines in a 9th Grade Class**

*Undergraduate - English*

As a part of the EdTPA (Illinois educator's licensure exam), one is required to utilize research to inform their teaching. In this project research was utilized to inform the teaching of Kate Chopin's "A Matter of Prejudice" and Ernest J. Gaines' "A Lesson Before Dying" in order to compare and contrast the characterization of the characters found within each text. Students engaged in comprehension activities which lent to "fishbowl" style small group discussions where the students constructed their knowledge. They were then asked to produce Venn diagrams to provide concrete evidence of their knowledge.

293. Zarate, Estefania

**Purification of NPC1 Protein in Mammalian Cells for Binding Studies**

*Undergraduate - Chemistry*

Niemann-Pick Disease, type C1 (NPC1) is a genetic, fatal, neurodegenerative disorder that results in accumulation of lipids in lysosomes. Mutations in the NPC1 gene results in disrupted lipid transport which contributes to the accumulation of lipid products. The NPC1 protein action mechanism is unknown. In this study, mammalian cells were used to optimize methods for transfecting cells with the NPC1 gene. Using transfection, resulting in overexpression of the NPC1 protein Western blot techniques were used to confirm the presence of NPC1 protein in transfected cells and the protein was purified by affinity chromatography. The purified protein protocol is currently being scaled and the resulting product will be tested to understand binding partners.
"Childhood Bone Cancers; The Similarities and Differences between Osteosarcoma and Ewing's Sarcoma" includes many details about childhood bone cancers, as well as the information needed to first understand them. This research includes bone structures and processes and was mainly gathered from many sources and writings. The sources used are compiled in this paper in the form of a literary review.

The two main diseases researched for this paper are Ewing's Sarcoma and Osteosarcoma, as those are the two most common childhood bone cancers. This research was done independently, and not in a Laboratory setting.

This paper aims to explore and compare the two cancers, and describe what it is like to be diagnosed with either of them. This paper explores the areas of research that are yet to be discovered regarding this topic, as well as what there is to learn from these conditions.
Impact
Poster/
Oral/
Oral Creative Presentations
Mental Health Hub

Undergraduate

Presentation Type: Impact Oral Presentation/Impact on Community/Civic Engagement and Social Justice

Mental health plays a significant role in the wellbeing and performance of college students; thus, it is the responsibility of academic communities to provide for this facet of student health. Given that mental illness is prevalent amongst most college students, it is alarming that only half of them feel comfortable disclosing their needs to their college services and many are entirely unaware of the resources available to them. Considering that over 70% of college students experience a mental health crisis and 64% of students no longer attend college because of a similar crisis, the aim of our project is to encourage preventative action. We can achieve this through a covert and free of cost web-based platform which increases accessibility to accurate information sources, directly connects students to campus resources, and fosters open communication surrounding mental health. We began by conducting a campus-wide survey to learn about students’ current use and knowledge of mental health resources on campus. Our envisioned online platform will compile campus resources, include bystander training workshops, and incorporate immediate suggestions for recognizing and addressing symptoms of mental health. First, rather than just listing mental health resources, an interactive questionnaire will be used to guide individual students to the appropriate services based on their responses to initial questions. Second, bystander training workshops will include video training on topics such as signs of depression in a friend or how to start a conversation about mental health. Finally, online coping mechanisms (“Feeling X, Try Y”) will be on the website to provide students with immediate support to mitigate symptoms of anxiety or depression. Campus mental health resources should be accessible and student-centric; this online platform serves as a bridge between students and existing campus resources, promoting a community effort to improve mental health.

The Impact of The National Democratic Training Committee's Live Trainings on Women of Color

Undergraduate

Presentation Type - Impact Oral Presentation/Impact on Community/Civic Engagement and Social Justice
At the beginning of this semester, I got accepted into an internship program at the National Democratic Training Committee. NDTC is an organization that trains candidates, potential candidates, staff and volunteer staff, and local progressive infrastructure on communications, digital, field, and fundraising. As a political science major, there is a huge difference between learning in the classroom and learning through real life experiences. As NDTC’s political partnerships intern, I have been engaged in research on various local and national political organizations in an effort to build relationships between them and NDTC. Recently, NDTC held a partner hosted training in New Orleans with Citizen She United with the main focus of increasing political action in the black women of Louisiana. I was lucky enough to be able to attend this training. Citizen She United is an aligned base of Black women who inform, advocate for, and enact a collective policy agenda to address the needs of Black women across Louisiana. Leading up to the training, much work was done on my part of researching and conducting outreach to other local organizations in order to have them appear at our Partner Fair. We were able to have four partners at the Louisiana training and it was such a joy to see all of my hard work pay off. Most importantly, it was awesome to see so many black women and allies of black women come out and attend an event so meaningful that was also geared towards them. I would like to demonstrate in my presentation the effort that goes into planning these live trainings and the large impact it has on specific communities, in this case the black women of Louisiana. I would also like to touch on the impact this internship has had on me and my professional development overall.

303. Akintoye, Funmilola

Fudge Boi Filter

Undergraduate

Presentation Type - Impact Creative Presentation/Impact on Community/Career Development

The technology industry as it currently stands contains a very homogenous demographic that only reflects a small population of the people that its products serve. As a result, there is a degree of embedded bias, or subconscious misrepresentation, within said products. The aim of Fudge Boi Filter is to direct these tools of automated inference in the opposite direction to benefit those marginalized groups, with a conscious acceptance of the bias embedded in such a filter. The filtration is meant to work at limiting the number of inappropriate and offensive unsolicited messages that users receive. This application uses object-oriented programming with extracted API calls in order to retrieve inbox messages from Tinder matches. From there, sentiment analysis is used as a
method of machine learning to build a model and label collected messages as
good or bad according to community data collected from the actual Tinder
experiences of underrepresented groups. The matches that contain messages
heavily marked as "bad" are deleted from the user's list of matches. Too often, as
a result, the majority of a user's matches end up being deleted which further
shows how dating applications such as Tinder are not considering the needs of
minority groups. This project is not meant to function simply as a spam filter, but
as a commentary on embedded bias in modern automated decision-making
systems.

304. Ali, Tayyaba

OrthoArmour: Revolutionizing Orthopedic Data Collection

Undergraduate

Presentation Type - Impact Oral Presentation/Impact on Self/Career Development

The orthopedic field is rapidly growing, but many subdivisions within it have seen
little innovation. This is especially true for multipurpose monitoring devices that
can distribute accurate and timely data to doctors while notifying any change in
behavior. While supplement devices, such as splints, have made their way into
the market to aid the fracture healing process, the cast still plays a vital role in
the recovery process for most patients. The most commonly used types of cast
cause many secondary injuries, as the skills of the applier are a critical necessity
to ensure that the patient heals properly. With technology developing rapidly, the
use of 3D printers and scanners may revolutionize the orthopedic casts we are
familiar with, for one which optimizes the patient's experience and decreases the
healing process duration. But the availability of printers and the price of printing
are major setbacks on an international level, with costs running in the hundreds
to thousands of dollars. That is where my design, OrthoArmour, can help.
OrthoArmour is a silicon sleeve with basic circuitry and sensors, to keep costs
low, which can be used for multiple purposes within the orthopedic medical field.
It can be used for the following situations: can be placed under casts or
prosthetics, where it serves as a direct monitoring device which reports updates
constantly to their healthcare professional; can be used for casting technician
training, where it can aid students to learn how to properly cast a model hand by
measuring the pressure they apply, any movement of the bone during
application, and the tightness of their wraps; and it can be used as an aid for
orthopedic surgery recovery, to monitor movement after surgery.
Alonzo, Alejandro

My Lens on Sexual Assault

Undergraduate

Presentation Type - Impact Oral Presentation/Impact on Self/Civic Engagement and Social Justice

The line between drunk sex and sexual assault is not so simple to understand as many believe and is not a black-and-white decision. The issues concerning campus rape is a complicated and subjective matter, different people respond to different experiences in their own way and interpret the situation differently as well. I attended a national Greek conference called the Association of Fraternal Leadership & Values. Here I was able to attend Doctor Gentry McCreary’s program titled “The Drunk Sex Problem” and here I realized that I use my own lens to define others’ situations and minimize them unconsciously because of my past experiences.

Dr. Gentry used an example where three women had similar experiences involving alcohol and sex, and two of them did not consider it sexual assault but one did. These women are all correct to feel and interpret their experiences however they want and the popular slogan “drunk sex is rape” is a wrongful black and white interpretation of drunk sex.

Sexual assaults and rape happen on our campus and I feel that Greek fraternities and sororities can strive for more than their usual events where they simply list numbers and resources for victims to go to if they’ve experienced these situations. The next step is to have students think critically and reflect on their past experiences to be more mindful on drunk sex while also not perpetuating the idea that drunk sex automatically makes you a victim/rapist.

Bondele, Allison; Ague, Travis; Patel, Janaki and Kandakudy, Annmary

Four Leaders, One Goal

Undergraduate

Presentation Type - Impact Oral Presentation/Impact on Self/Leadership and Involvement

Project LEAD (leadership, education, and development) is a three day program of workshops designed to assist students in developing leadership skills and getting involved on campus from day one. This program is for first year and transfer students, which we found as a benefit to interact with individuals walking
directly in the same shoes. Project LEAD strengthened our knowledge of personal identities, values, friendships, and social change. We, Allison Bondele, Janaki Patel, Travis Ague, and Shalu Kandakudy, can confidently say Project LEAD has positively shaped our UIC experience from directed sessions, to meal times, and leisure activities. We learned and grew significantly in those three days of Project Lead. We learned how to be better leaders through self discovery of our identities and values. We practiced critical thinking about how we could be a part of social change. Project Lead gave us the opportunity to practice our strengths and build on our weaknesses in small and large group settings. We were given a broader picture of how we could positively make a difference within this wonderful city of resources we have at our fingertips. Project Lead also offered the opportunity for its participants to assist other students on UIC’s official move-in day. We are so appreciative of this part of the program because it allowed us to meet and interact with other students, have a better understanding of the campus layout, and build relationships with campus housing faculty. In our first year of college, we took what we learned about ourselves and leadership and applied the experience to our Hall Council positions and other leadership roles. Project Lead made us better leaders, thus having an immense impact on us. We hope to keep spreading the knowledge we gained through our years at UIC and beyond.

307. Brunson, Fatima

Organizational Conditions Impacting Teachers’ Culturally Responsive Pedagogies: A Look at African American Schools

Graduate / Professional

Presentation Type - Impact Oral Presentation/Impact on Community/Global Perspective and Diversity

Organizational Conditions Impacting Teachers’ Culturally Responsive Pedagogies: A Look at African American Schools In the midst of discussions about eliminating the racialized academic achievement gap, little has been done to make pedagogical supports in high minority schools a central area of investigation. Previously, solutions have emphasized offering all students the same curriculum, taught in the same way—based on the language, worldview, and experiences of White English-speakers (Gutierrez, Asato, Santos, & Gotanda, 2002). As a result, US public schools have yet to meet any educational policy goals related to equitable student learning outcomes. This research attempts to challenge notions of standardizing teaching practice to address the racialized academic achievement gap. In doing so, this study builds on the work of those attempting to address an ever-present opportunity gap by employing
culturally responsive approaches. Culturally responsive pedagogy is dynamic approach shown to be effective when attempting to increase learning opportunities for historically marginalized groups, particularly African Americans. While there is a growing amount of evidence suggesting teachers incorporate cultural characteristics, experiences, and perspectives of ethnically diverse students as conduits for teaching them more effectively (Gay, 2002); a significant amount of evidence (e.g., Enyedy & Mukhopadhyay, 2007; Young, 2010) points to a lack of understanding, after pre-service training, of what it means to be a culturally relevant teacher (Dixson & Dodo Seriki, 2014) or that culturally relevant pedagogy has been reduced to a set of fixed behaviors (Ladson-Billings, 1995). Thus, my research is used to investigate the role of schools in supporting and developing teachers’ adoption of culturally responsive pedagogies. I employed qualitative research methods, using a replication case study design looking at two predominately African-American school organizations. By conducting semi-structured interviews, observations, and a document analysis, the findings highlight major influences on teacher’ knowledge and commitments for enacting culturally responsive pedagogies.

308. Cao, Kevin and Shirley, Austin

Equipping Chicago Locals for the Modern Age: Data Transparency through Neighborhood Change Statements

Undergraduate

Presentation Type - Impact Poster/Impact on Community/Civic Engagement and Social Justice

Like many urban centers like Chicago, rapid neighborhood displacement and gentrification has been a subtler form of economic segregation. As neighborhoods meet with an influx of more affluent residents, neighborhood developments raise the overall demand for housing in the neighborhood, forcing out low-income and minority populations through rising rent and evictions. We propose using creating Neighborhood Inclusivity Statements through an independent municipal research bureau that directly focus on the public good of affordable housing. The city of Chicago should create accessible information towards neighborhood change and zoning to serve as tools for community transparency and grassroots promotion of affordable housing. We have piloted the program with Pilsen Alliance to gauge the efficacy of disseminated data towards the discussion of affordable housing as a public good.
309. **Coffee, Alexis and Coffee, Jessica**

**Kokoro- A Japanese and American Culture Comparison Blog**

Undergraduate

Presentation Type - Impact Creative Presentation/Self/Global Perspective and Diversity

The purpose of this blog is to introduce Japanese culture to Americans as well as show comparable aspects of American culture to a Japanese audience. The blog will focus mainly on aspects daily life and cultural festivals. “Kokoro” means heart in Japanese. We want to focus on the heart of Japanese culture which comes from the connection between all of the people living in Japan. We believe the daily life activities and festivals unique to Japan are that connection: the “kokoro” of Japan. We feel that can also apply to the United States of America. All of us are connected by daily activities and celebrations unique to our country. By exploring what makes Japan and America different, yet still connected, we hope to bridge two world cultures and spark interests in the minds of Japanese citizens and American citizens alike.

310. **Conroy, Kailey**

**Importance of Communication and Delegation in Leadership**

Undergraduate

Presentation Type - Impact Oral Presentation/Impact on Self/Leadership and Involvement

Being the oldest sibling and cousin in my extended family, leadership was a trait I always thought came naturally to me. Because of this, when I first entered my role as a committee chair for the Student Activities Board, a high impact organization, I thought I had it all figured out. During my first semester as a committee chair, one of my biggest difficulties was not knowing how to swallow my pride and admit that I was confused. I did not know what questions to ask, and because of this, I often failed to start projects. My first semester as a committee chair I only put on one successful event. Once I focused on communication, the following semester I managed to execute four successful events. Although these events were successful, the entire duration of the semester I felt like I was constantly drowning in work. I realized, in order to continue my role as a committee chair without burning out, I had to start delegating work. Delegating was an extremely difficult task for me. I would
consider myself to be a perfectionist, so handing off a whole event was one of the most scary but beneficial learning experiences I have had to date. The following semester as a committee chair, my events were even more successful because I was able to manage events instead of trying to juggle every small detail. This allowed my committee to have more hands on experience in event planning and leadership, and gave me the ability to oversee events and manage without running myself thin. This allowed us to carry out SAB’s mission of creating events for UIC students to enhance their college experience. My experience in SAB not only allowed me to impact my organization, but allowed my organization to positively impact UIC students.

311. Criollo, Ana

How Religious Assemblies Assist in Maintaining Culture, Particularly within Greek-American Communities

Undergraduate

Presentation Type - Impact Oral Presentation/Impact on Community/Global Perspective and Diversity

My goal throughout this research project is to explore how religious institutions shape immigrant groups in the diaspora in preserving culture while also assimilating into the American culture. The United States has become a melting pot of cultures and the separation of state and church has provided the space for immigrants to establish churches. Such spaces have become a locus for immigrants to not only assemble in a religious space but to continue both secular and non-secular cultural practices. I believe this is a topic that touches upon most immigrant lives whether or not they consider themselves to be religious. I have specifically looked at the Greek-American community of the Chicago-land area and how the Greek-Orthodox Church has influenced their lives. Participation in the Greek-Orthodox church varies from person to person but most agreed that religion has become a bigger part of the Greek identity here in the United States than back in the homeland. I hope this research adds to the conversation about the connection between national, ethnic, religious and cultural identities in the United States. Immigrants and their proceeding generations find themselves navigating various identities in order to assimilate into the US while also maintaining their “other” identities.

312. Denemark, Katherine

Educational Living
My capstone topic is a study of the relationship between the experiences of living on campus and learning on campus. Through this study I compare various housing styles and designs from works across the country, along with the relationship of the landscape and location to the building, and the effects it's has on commuters as well, not just residents. For my proposal I create a series of hybrid housing building that has both living and learning qualities. It embodies the concept of Pedagogy, which claims that what is learned outside of the classroom (when given the right conditions) is just as important as what is learned inside the classroom. Through these studies, a series of possible designs and iterations will be presented using UIC campus as a base example. These designs will showcase the possibilities that can be taken for future housing projects in other universities, along with addressing the changing cultural diversity in campuses and how to incorporate them in future university life. I will use my years of experience in Housing, studio knowledge, my faculty instructor, and other resources to run the proposal and create a series of diagrams and drawings to create a physical aid and final product along with a written statement.

313. Dickens, Janeil and Romer, Aaliyah

Black Tech Scholars In Action

Our presentation focuses on our experiences as scholars in the co-curricular program. The mission of the UIC Black Tech Scholars Program is to ensure professional and web development opportunities for African American undergraduate students in order to foster interest and representation in the technology industry. The Black Tech Scholars Program provides students of color from a variety of majors with the opportunity to acquire transferable professional development skills and gain valuable hands-on experience with assigned digital projects. Our presentation will showcase the following: A four minute testimonial video detailing the description of the program and the benefits of being a scholars A sample presentation and discussion of the mobile application created during our participation.
314. Duarte, Luis

BAM Impact and Engagement on Male Youth

Undergraduate

Presentation Type – Impact Poster/Impact on Self/Civic Engagement and Social Justice

I have interned at Youth Guidance for over 500 hours my senior year in the Becoming a Man (BAM) program. BAM has impact for young men in Chicago in both the civic engagement and social areas providing an intensive intervention for the most high-risk urban men in poorly resourced public high schools in heavy gang activity neighborhoods of Chicago. I will also discuss the impact that the internship has had on me as an intern within the program through hands-on involvement. The Becoming a Man program is a place where young high school males are not only allowed to express their feelings but also speak about real-life obstacles/problems. Through the program, values such as positive anger expression and respect for womanhood are taught to be used in their everyday life. Helping these young men divert gangs, stay in school and learn important psychological skills has had a significant impact on me as a developing professional accepted to social work graduate school at the University of Chicago, experiences that are both eye-opening and relatable.

315. Garcia, Danalyn and Truong, Tina

Association of Fraternal Values and Leadership (AFLV) Conference Aid in Presidents’ Burnout

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Self/Leadership and Involvement

There is an emphasis on undergraduate college students about taking on leadership positions, in order to have experience, advance your resume, and gain valuable skills that will ultimately help one be a competitive applicant when applying to graduate schools, become a desirable prospective job applicant, etc. that can be pressuring to those who additionally tackle multiple extracurriculars, jobs, classes and outside obligations at once. It is more than time-consuming; it can mentally and physically exhaust all energy out of you. A university student organization president is a position that demands your time and attention.
throughout your day, every single day. Being a president of a fraternity or sorority organization is different from any kind of president; it comes with its own different aspects and dimensions that no other president experiences. Additionally, they handle all external and internal conflicts or duties in regard to their organizations as well as ensuring the well-being of each and every member that upholds their organization’s name. It is inevitable to be the president of a fraternity or sorority and not be burned out; whether it be from the start, middle, end or all throughout your term. However, the Association of Fraternal Values and Leadership (AFLV) Conference supported in relieving the pain and stress of leaders in Greek Life as well as provided resources and insight through all day workshops, keynote speakers, and connecting with other Greek Life Leaders across the country. It allowed leaders to resonate, learn, and bring back the revitalized energy with them personally, to their chapter, and to their Greek Life community after a long and influential four day, three-night experience.

316. Garcia, Maria

The Experiences and History of Women’s Imprisonment in Argentina

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Community/Global Perspective and Diversity

The history of women's imprisonment in Argentina has not catered to the social, physical, emotional and mental needs of the Argentine female prisoners nor females of foreign origin due to the fact the women's prison was historically designed under policies and laws that pertained to men. Due to this, the Federal Penitentiary Service (SPF) female prisons are currently in violation of the Argentinean national imprisonment Law 24.660, and the Bangkok Rules. Both Argentinean and foreign females are deprived of the right to family unity/parental rights, comfortable/clean living conditions, safety and security, and health and education. These violations of human rights committed by the SPF impact on incarcerated women's physical and emotional wellbeing. In the case of non-citizens, they are inherently more vulnerable due to the effect of being imprisoned in a foreign country. Prisoners, who are non-citizens, are facing violations of their human rights due to cultural differences and language barriers, the distance from their home, family, consulates, and legal networks, resulting in discrimination vis-a-vis national prisoners. Argentina has not acknowledged its need to adapt its patriarchal male-centric policies regarding prisons and the administration of justice or their impact on prisoners’ relationships, family lives, human rights and the international legal issues that this creates. In sum, women in the prison system face grave injustices and violations of human rights that
create a myriad of health, personal, familial and legal issues that they will have to endure within imprisonment, with enduring impact or consequence in their reentry.

317. Guzman, Elena

Through the Eyes of Brighton Park

Undergraduate

Presentation Type – Impact Creative Presentation/Impact on Community/Global Perspective and Diversity

“Through the Eyes of Brighton Park” is an in-progress research project that aims to capture oral histories, images, and create creative maps through the perspective of current long-time residents and local independent business owners of the Chicago neighborhood of Brighton Park. Brighton Park is a neighborhood located in southwest Chicago and is a predominately Latinx neighborhood that is slowly encountering the inclusion of primarily first generation Chinese and Chinese immigrants. Additionally, Brighton Park is in the midst of a slow but steady gentrification process as corporate businesses are beginning to compete with independently owned businesses. This project utilized field notes, interviews, photographs, and textual analysis of scholarly articles to better understand, observe, and analyze the social processes occurring in Brighton Park. Based on interviews with individuals who work and live in Brighton Park, observations of local community meetings facilitated by the Brighton Park Neighborhood Council, textual analysis of elementary school yearbooks, and literature review, I present a series of alternative social maps of Brighton Park that prioritize the visions and perspectives of long-time residents and independent business owners of Brighton Park. These social maps represent a multi-dimensional narrative of Brighton Park that reflects notions of “authenticity” and “legacy” with respect family, community, and accessibility, which Brighton Park residents associate with the neighborhood, while revealing complex relationships between Latinx residents, new corporate businesses, and Chinese immigrants.

318. Harnisch, Nicolas J.

Psychosis Interventions for Individuals at High Risk

Undergraduate
Rush University’s Social Neuroscience and Psychopathology Lab (SNaP Lab) conducts research to evaluate the efficacy of Targeted Cognitive Training to improve cognitive and social cognitive functioning in individuals at a clinical high risk (CHR) for developing psychosis. Individuals at CHR experience mild psychotic-like symptoms (i.e., unusual beliefs) that suggests they are at an elevated risk of developing a psychotic disorder. By studying this population, we are better able to understand and develop interventions to prevent the onset of psychosis and/or mitigate impairment in everyday functioning and quality of life. To test this efficacy, the SNaP Lab uses randomized clinical trials with cognition and social cognition as the primary treatment outcome with hope that daily functioning will be a secondary outcome. Participants come into the lab for pre, mid, and post training visits while also playing computer games at home. Neural systems are assessed through functional Magnetic Resonance Imaging (fMRI) scans at each of these training levels as well. The hypothesis behind these trainings is that they will improve the neural systems that foster cognitive skills which will then be reflected by improvements in daily functioning. Engaging in progressive research has provided me the opportunity to both work with individuals face-to-face and see how these individuals’ perceptions and behaviors can change after a series of testing and training. I have been able to observe clinical assessments, training visits, fMRI scanning, and assist in task administration for these participants. With my goal of becoming a clinical psychologist, this research has bolstered my knowledge in the area of assessment and differential diagnosis of psychotic symptoms and disorders, taught me about administration and interpretation of neuropsychological testing; and prepared me to better practice with those who have these complex symptoms, while simultaneously preparing me for advanced internship opportunities through the UIC Applied Psychology Program.

319. Hatch, Robert

Reach Out

Undergraduate

Presentation Type – Impact Creative Presentation/Impact on Community/Environmental Awareness and Sustainability

There are many unfortunate stories that are told each year that affect lives of loved ones, hurt the individuals who had to tell these tales, and cause unwanted stress in people’s’ lives. The lack of reaching out to campus resources has brought a wide variety of factors in a person’s life, of which typically is negative.
People are told constantly that there are multiple resources that are offered on campus. When we look at UIC, we have resources that range from just general resources needed at campus, all the way to students who are barely making in college, and feel like they are not going to make it. The problem is that these students do not take the initiative to going to these resources and asking for the help desired. This is why I think it’s so important to get the message of attempting to go to these, because you will miss all the shots you never took. In specific, one example that can be looked at is academics. There are many academic centers that are held at UIC, in which the goal is to understand material better. However, I feel that these resources are simply not taken advantage of as much as they should be. For example, the Writing Center is a great way to better your writing, and is something that is recommended for those taking classes in which papers are written. Some classes mandate that the students go to the Writing Center a certain amount of times, but after these students go, the amount of times they go afterwards is a drastic change, in which some students rarely go. By the time that these students figure out that they should continue to take advantage of them, they have already run the risk of taking bad grades, or grades that could have been better, leaving them in the “If Only” stage.

320. Hernandez, Jennifer

Navigating the Labyrinth: The Influence of Large University Policies on Community College Transfer Students

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Community

Are universities meeting the needs of their community college transfer students? The latest literature suggests that there are gaps: students tend to feel unprepared and under-served at four-year institutions. While onus has historically been placed on the community colleges to prepare students for transfer, universities are increasingly held responsible for the success of students who transfer into their institutions. Current research on the relationship between university policies and transfer student experiences focus on how many two-year courses a student receives credit for at the four-year level and how that relates to degree completion. Qualitative analyses tend to narrow student experiences into two categories: social and academic factors that impact transfer. This study seeks to expand these notions by introducing policy as a third factor that stretches beyond course transfer agreements. While university policies impact all students, community college transfer students experience a unique challenge as they transfer between two very different types of institutions, a process that has
been shown to delay graduation, increase student loans, and lead to more students dropping out entirely. By letting students and staff lead me to which university policies and procedures have helped and hindered the transfer process, this study aims to clarify whether and to what extent policies inform student and staff interactions and how those policies may impede or support transfer student success.

321. Hess, Katelyn; Armenise, Abby; Waller, Jacob; Dean, Erin; Nannie, Jackson; Iluyomade, Jefta and Patel, Bhavin

Residence Hall Association Creating Leaders with Project Lead

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Community/Leadership and Involvement

The RHA executive board participated in planning and leading during the collaboration with Project Lead. Members were leaders during the event as well as participants, we learned to further developed skills and promote leadership opportunities within campus housing. RHA connected and created bonds with residents during the summer which lead to those students engaging in Hall Councils, NRHH, SISTERS, and PBMA. These students continued to attend RHA events and RHA conferences. The impact RHA had on students at Project Lead led to these students craving more involvement. The RHA executive board was impacted as well. This year’s executive board has participated and worked more together than ever in previous years. Collaborating with all housing organizations and creating close bonds with each other. Allowing all future events to be a success. This change made by this year’s RHA executive board created a new constitution, roles, and expectations for future RHA boards. The growth of our individual leadership skills during this year starting with Project Lead was so beneficial that every executive board member continued to advance in opportunities for 2019-2020. Including Resident assistant positions, job opportunities and executive board memberships. RHA for the first time this year also planned, marketed and budgeted the Project Lead Reunion. The purpose to further grow the bonds made earlier in the year and touch base with our peers. The reunion included conversations, skill development, question/answer topics and future information on new leadership roles. Space was social, comfortable and RHA enjoyed programming an event that students were excited to attend and reconnect. The RHA board was able to communicate the growth as individuals and hear about their peer’s growth as well. The UIC RHA continues to be the voice of the students. The success of this year is credited to the impact of Project Lead.
323. Jahangir, Adil

**Monetary Policy Recommendation for US Economy**

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Community/Global Perspective and Diversity

The US economy is maintained through two major policies, namely fiscal and monetary. Monetary policy is concerned with price stability and unemployment rates. We studied the current economy and forecasts of the next several years in terms of the four macroeconomic indicators: Consumption, Investment, Government expenditure and Net exports. We also observed labor demand and supply as well as international exchange rates to provide a suitable monetary policy recommendation to the Federal Reserve Bank of America. FOMC predictions, Yield curves, Risk Factors, Risk Mitigation strategies, Treasury bonds and securities are taken into account. We believe this monetary policy recommendation and application of such will better impact the US macroeconomy.

324. Joyce, Tyler

**Evaluation of the Quantitative Value Algorithm - Coded in Python**

Undergraduate

Presentation Type – Impact Oral Presentation

Given the contemporary rise of a data analytics revolution, the tools available to analyze data are omnipresent and further, very robust. These tools, paired with years of research conducted on methods to evaluate equities on the US stock market, can be used to find inefficiencies in the stock market, challenging the efficient market hypothesis. Moreover, an engaging, possibly arduous, activity is testing prior research, encompassing tactics to “beat” the market, to determine if prior methods are of contemporary interest; thus, upon examination, we can evaluate whether the market has adjusted to published research or if such methods are still relevant. In this paper, a model is built to resemble "The Final
Quantitative Checklist" as presented in Quantitative Value by Wesley R. Gray, Ph.D., and Tobias E. Carlisle, LLB. The model published by Messrs. Gray and Carlisle implements various metrics to filter a large universe of equities down to a modest set of stocks that should prove superior to the S&P500 index, a favored benchmark of U.S. stock market performance, and other models, such as the “Magic Formula” built by Joel Greenblatt. In the first stage of construction, Quantitative Value was read, and the educational resources at hand and decisions for the model were established. Second, the algorithm’s metrics were built, seeking to demonstrate an effective way to algorithmically build a profitable portfolio, and these were applied on historical stock market data. Third, the predictive power of the model was assessed, and discussions took place on assumptions and adjustments that could be made to modify the code for better results. Lastly, with an acceptable model, machine learning applications were utilized to provide further insight into the performance of the model.

325. Kaur, Harveen; Vijayakumar, Vishwaarth and Kulbak, Danielle

Improving Access to Bystander CPR Training for Individuals in Latinx Communities

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Community/Leadership and Involvement

Sudden Cardiac Arrest (SCA) is the third leading cause of death in the US, affecting 420,000 people each year. Bystander cardiopulmonary resuscitation (BCPR) involves compressing the chest to manually keep the heart pumping to deliver oxygen to the body. Receiving BCPR immediately within the first few minutes following cardiac arrest is positively associated with greater SCA survival rates. However, many individuals lack the awareness or confidence to perform CPR in an emergency. Therefore, the solution lies in widespread community BCPR training. Previous studies have shown that BCPR rates vary across ethnic groups. In particular, the Latinx community receives BCPR at half the rate that Caucasian communities do. In conjunction with weekly classes on Global Health, we partnered with Illinois Heart Rescue (ILHR) to organize and host BCPR training sessions to expand the outreach efforts of ILHR. The goals for our project were to educate individuals in Latinx communities in Chicago about the importance of BCPR and how to administer it. Over the course of a semester, we trained 285 individuals in 3 different Latinx communities in Chicago including Pilsen, Bricktown, and Englewood to increase their confidence in administering BCPR. We conducted BCPR training sessions at various places including health fairs, health clinics, and public events to maximize outreach. Confidence in
performing BCPR was measured through pre-training and post-training surveys conducted orally in both Spanish and English. Additionally, by counting the number of individuals trained at each event, we were able to track the true effect of our outreach. Although Chicago Public Schools have mandated that all students must learn BCPR, necessary oversight and initiative should be encouraged to ensure that these goals are reached across all ethnicities.

326. Kim, Sean

Exploring my Asian American Heritage

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Self/Global Perspective and Diversity

Taking the initiative to explore the Asian American Interest Organization of Kappa Pi Beta Fraternity Incorporated (KPiB) exposed me to a part of my identity I had long shunned. Before college, I had grown up in Caucasian dominated neighborhoods. As a child, this environment had numerous unconscious and conscious factors that led me to ignore my Korean heritage. Therefore, when coming to college, I intended to explore more leadership opportunities within strictly business-oriented student organizations. As I reach the end of my second semester, I find myself heavily engaged in the Asian American community, not just within UIC, but in Chicago. Holding executive leadership positions within KPiB has allowed me to transfer my prior experiences from founding large scale events over to opportunities within the Asian American community in Chicago.

327. Lemus, Jocelyne

Latina Breast Cancer Awareness in Financial Resources: Healthcare Personnel’s Perspective

Undergraduate

Presentation Type – Impact Poster/Impact on Community/Civic Engagement and Social Justice

Background: Little is known how existing financial assistance programs address these unique needs and Latinas' awareness of them. To address this gap, we conducted 10 semi-structured interviews with healthcare professionals to understand: 1) Latina patients’ unique economic needs; 2) availability of financial
programs to address these needs; and, 3) Latinas’ awareness of these programs.

Methods: Staff from ALAS-Wings and the University of Illinois at Chicago used purposive sampling strategies to recruit 10 healthcare personnel familiar with financial aspects of cancer care for 60-minute semi-structured interviews.

Results: The average age of participants was 43.7 years, 80% identified as female, 50% identified as Latinx, and 50% had graduate degrees. The average number of years participants had engaged breast cancer patients in treatment and survivorship care was respectively 5.7 and 4.97. In terms of insurance status, 70% of personnel reported that most Latina patients they engaged were uninsured or uninsured. In terms of costs, healthcare professionals perceived that Latinas specifically struggled with non-medical costs (e.g., transportation, living utilities), for which there was economic support from a few foundations (Pink Fund, Patient Advocate Foundation, American Cancer Society). However, healthcare professionals did not believe Latinas were aware of financial programs due to shame/embarrassment and language barriers. Healthcare professionals perceived that these barriers and the prioritization of surviving resulted in delays in seeking financial supports. Discussion: Our findings highlight the importance of healthcare professionals that are able to explain the availability of resources to Latina breast cancer patients in linguistically and culturally astute strategies immediately following diagnosis and throughout treatment. This resources will help increase Latinas’ awareness and utilization of resources for non-medical and other costs.

328. Marinelli, Audrey

Assessing Cosmetology Students’ Attitudes and Knowledge of Intimate Partner Violence Following Implementation of Training Curriculum Adapted from “Cut It Out”

Graduate / Professional

Presentation Type – Impact Oral Presentation/Impact on Community/Civic Engagement and Social Justice Intimate Partner Violence (IPV) is a pervasive public health threat that affects 1 in 3 women and 1 in 4 men in their lifetime. Due to the linguistic, cultural, and socio-economic challenges they often face, IPV survivors in immigrant communities are less likely to access IPV services in the healthcare system or other IPV organizations. This highlights the need to develop culturally-specific community interventions aimed at referring survivors to the appropriate resources. Cosmetologists have been shown to be an effective means of health promotion in community-based participatory research, including
hypertension screening. We hypothesize that, following our training curriculum, cosmetology students will improve their knowledge about IPV and have more positive attitude regarding the importance of integrating client IPV screenings into their career. This study will use a prospective pre-post intervention design to explore knowledge and attitudes regarding IPV of participating cosmetology students before, after, and 3 months following an IPV training curriculum adapted from the CUT IT OUT® program using surveys. Respondents’ knowledge improved in 17 of 25 categories, worsened in 5, and remained unchanged in 3. In regard to their attitudes, students were significantly more likely to respond that their profession should be more involved in identifying IPV survivors (P=0.02). In addition, students were significantly more likely to respond that IPV was not a part of normal everyday life (P=0.03). Compared to before the training session, cosmetology students’ knowledge and attitudes regarding IPV improved after the training session. Our culturally-specific half-day training curriculum is an effective means of educating cosmetology students to recognize and refer IPV survivors.

329. Martinez, Michael

Supporting New and Student-Run Speech Teams, Overcoming Barriers which Exclude Them from National Competitions

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Community/Leadership and Involvement

The number of schools attending the NFA National Tournament has been decreasing, with few new forensics programs arising on the national circuit with sustainable funding practices. In 2015, there were 87 schools in attendance at the NFA National tournament compared to 64 schools in 2018. Although institutional support has been shrinking for forensics programs across the nation, a considerable area of growth has been the start-up of student--run teams. To further explore this issue, a focus group and survey were conducted. Fifteen student--run programs were represented through the participation of 36 student leaders. The research revealed that the most common barrier new student programs face is insufficient funding. The second most frequently reported barrier is the lack of accessible information surrounding sustainable practices for program longevity. There is considerable difficulty in maintaining a new forensics program, and the aforementioned barriers often result in the deterioration of new programs. This project outlines a proposal which complements the National Forensics Association’s ongoing commitment to “expanding and enhancing collegiate educational opportunities in speech communication nationwide.” In addition, by investing in new programs during their first year, NFA can promote
the ability for new programs to become ongoing and paying participants in the NFA national tournament and organization.

330. Medina, Lorena

Leadership and Involvement at UIC Campus Housing

Undergraduate

Presentation Type – Impact Poster/Impact on Self/Leadership and Involvement

In this presentation, I will be talking about my early move in experience in Project LEAD. I will talk about what Project LEAD is, how it became the starter point to the person I am today, and what I learned from Project LEAD. Then I will move into the topic of hall council and why I became apart of the hall council and why it us important to have hall councils exist in our campus housing community. I will also mention the winter and Spring leadership retreats that I attended and what I learned from that also.

331. Moudgil, Sahil

Emerging Technologies in Electric Vehicles

Undergraduate

Presentation Type – Impact Poster/Impact on Community/Environmental Awareness and Sustainability

I am a Mechanical Engineering major at UIC. I am a freshman student researching in emerging technologies in Electric Vehicles. I am interested in this topic because I am fond of mechanics and automation, and I want to contribute my knowledge and skills to society and want to help the world in the way that will affect the automobile industry creating the new technology increasing the efficiency of mobility and to keep the environment sustainable. I am looking forward to study into a research sector. This research project aims to generate the electricity while on mobility, which means generation energy while vehicle is running on the road. It states that we can generate energy by setting up piezoelectric plates in the wheels of the vehicle. Piezoelectricity is the form of energy which is generated when pressure is applied, and that pressure is then turned into the energy which is then converted in the form of electricity through which a vehicle can run on green energy without carbon emissions with efficiency rates beyond 80% because it is known that if pressure is applied correctly then a
piezoelectric quartz material of 1 cm³ can produce a voltage of 12000 volts which can generate enormous amount of energy to run a vehicle without any battery inputs, “For example, a 1 cm³ cube of quartz with 2 kN (500 lbf) of correctly applied force can produce a voltage of 12500 V”, I believe that carbon emissions which is currently the most pressing issue, can only be sorted out by converting internal combustion engines to the electric engines which are ecofriendly and do not harm environment by emitting carbon waste. Moreover, this technology can revolutionize the industry making this sector wider and broader. Preferably, I think that this could be a possible reason for the evolution because, I’ve seen several pieces of evidence which proves that this technology can lead to change in society in several ways. I’ve worked with the California Energy Commission on this topic researching more into it but their perspective and approach to the topic was different. In fact, this idea was driven by interacting with CEC because they were working on the Piezoelectric energy harvester. This project demanded huge funding and high investments of time and money for lesser efficiency rates which after all led to the closer of this project. Then on researching further on this proposal, I thought of turning this idea to the whole new level. I’ve even noticed that the government of Israel is already working on it and they are generating energy through their rail road systems which is extremely superior in terms of the development of the country’s infrastructure. Academically, I think that it is a difficult task, but it is not impossible to do. I believe that science has taken this world to the whole new level with several advantages and disadvantages which is good but this time I’ve got an idea which will turn it out to the totally efficient and renewable resources of energy which can be regenerated each time during mobility. Publicly, I personally think that I’ve never discussed this with any of the professor or mentor who would help me out in the way that I can judge it. I think that under the influence of a great mentor and my professors, I can make it happen with help of hard work, dedication and focus.

332. Narayanan, Hansika and Akkoor, Neharika

Cooking Matters: An Educational Oasis in the Chicago Food Desert

Graduate / Professional

Presentation Type – Impact Oral Presentation/Impact on Community/Leadership and Involvement

The University of Illinois Hospital (UIH) and the surrounding community is located in one of the largest ‘food deserts’ in Chicago. Many UIH patients have limited access to affordable, nutritious food. Poor access to fresh food as well as disproportionately high costs prohibit many individuals from maintaining healthy
diets, which impacts their overall health and contributes to the progression of chronic disease. The UIC College of Medicine student organization FRUIT (Fresh Urban Resources Initiative Team) partnered with EverThrive Illinois to teach Cooking Matters classes to patients. The classes are taught by trained medical, nursing, and nutrition students. Patients, especially those with chronic health conditions such as obesity or diabetes, are referred by UIH Pilsen clinic and Miles Square clinic. The goal of the classes is to empower patients with skills to purchase affordable, fresh ingredients and prepare nutritious meals. Each class focuses on a single topic, such as whole grains or vegetables, with an underlying theme of cost-effectiveness. After an hour-long discussion on the weekly topic, students and patients work together to make a recipe. The class structure allows patients to explore new produce and spices while helping them feel comfortable with cooking new recipes. They learn how to prepare healthy meals on a tight budget and set smart goals regarding nutrition. Patients are given a recipe book with nutrition guides during the first week, and they receive fresh ingredients to take home after every class. At this time, four sessions (with six classes per session) were held for over thirty patients. Patients love the cooking classes, with pre- and post-class surveys indicating that they gained more knowledge about healthy cooking and incorporating nutritious food into their meals. FRUIT is excited to continue free Cooking Matters classes for patients and help them make positive changes to reach their health goals!

333. Nussbaum, Ej

To Make Healing Imaginable: Culturally Embedded Art Practice as a form of Research

Graduate / Professional

Presentation Type – Impact Creative Presentation/Impact on Self/Civic Engagement and Social Justice

To Make Healing Imaginable: Culturally Embedded Art Practice as a form of Research

What if I could break up with my eating disorder by personifying it as a bad ex named Ed? This is the key question of my current film series, 130 Ways of Breaking Up and Getting Over Ed, in which I perform and film 130 instructions on how to break up and get over a romantic partner. The instructions I follow are from pop culture sources such as Teen Vogue and Wikihow articles. In my film, Spring Cleaning, I follow the advice of a Wikihow article to “remove painful memory triggers of your ex”. I interpret this instruction by breaking a scale through a series of escalating tools and techniques. By interpreting these instructions from pop culture discourses, I am changing my relationship to my
body through a series of individual and collective performances. I am also creating a wider cultural conversation around how we understand eating disorders and how we imagine healing. Throughout the project I utilize Alfred Gell’s theories in Art and Agency, particularly his idea that art mediates social agency. While Gell’s theories have, up until this point, been utilized primarily by anthropologists studying the artistic or craft-based artifacts of others, my work opens up the possibility for Gell’s theories to be applied by artists to our own art practices- including conceptual and timed based work such as film. By examining pop culture discourses around break ups and working with everyday objects such as scales and hammers, my practice affirms that art has the potential to change our relationships to our bodies on both the personal and cultural level because art is embedded in society rather than a privileged space outside of ideology or power.

334. Omosebi, Oluwayomi and Sacay, Rita

One Size Does Not Fit All

Graduate / Professional

Presentation Type – Impact Oral Presentation/Impact on Career Development/Leadership and Involvement

Peer Success Coaches provide students with tools and resources to achieve their goals today and for their lifetime. An ideal coaching situation is when student and coach are working towards accomplishing student’s goal, whether it is academic or non-academic. Being a peer success coach this year taught us that there is no single approach to coaching. Our professional development and training revolved around theoretical and practical approaches to coaching. Some of the most applicable frameworks discussed during our professional development were the Volition Decision-Making model (Heckhausen & Heckhausen, 1991) and the Motivational Interviewing (Miller & Rollnick, 2012) on motivation that theorizes the institutional support that can change student’s behavior and help them pass through their main challenge. In addition, we found helpful to understand the attributional theory (Weiner, 2010) on students processing of positive and negative outcomes. Peer coaching presented us with an ethical dilemma. The audience will be asked to participate in a discussion, regarding the following questions: How, we as coaches, can suggest students to either ‘withdraw’ or ‘retake’ classes when they have fewer or no financial resources to pay for another semester? Will UIC support students financially so he/she can succeed?
335. Portis, Tyler

I Found It

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Career Development/Career Development

When students enter college, they all look for it. For some students, they always knew what it was. Other students take years to figure it out. For me, I found it during my second year of college and has been working towards it since then. Let me clarify what "it" even is. It is my future, my passion, and my "why." I am happy to say I am graduating with a mission behind my work and connection to do so. Through my UIC experience, I discovered the impact I want to create the world. My "why" entails cultivating future change agents to create a more equitable world. My UIC experience helped me discover something I knew all along.

336. Qureshi, Maha

Who Am I? SAB's Influence on Me

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Self/Leadership and Involvement

The Student Activities Board (SAB) is described as a high impact engagement activity, but I did not truly understand what that meant until this past year. Our core mission is to plan interactive, entertaining, and educational events that bring the UIC community together to form long-lasting relationships, along with school spirit. This sounds simple enough, right? That’s what I believed when I first entered the role of president of this organization. This position quickly showed me that my preconceived notions were incorrect and that to successful carry out this role, I had to change not only my thoughts, but also my actions. The way I perceive relationships within and out of a professional setting changed due to experiences within the organization, allowing me to effectively handle various types of relationships. This experience has also improved the way I resolve conflicts with peers, allowing for a healthier professional, and even personal, environment. The overall experience I have had within SAB has demonstrated that there is a difference between being a leader within the classroom and a leader in an organization as well. I have felt the impact of being an integral part of
SAB through the ups-and-downs that come with the role of president, which allowed me to enhance my skills and develop long lasting relationships.

337. Rao, Asha; Evans, Brian and Griffin, Khaleah

The Positive Impact of National Residence Hall Honorary on Campus Housing Residents

Undergraduate

Presentation Type – Impact Creative Presentation/Impact on Community/Leadership and Involvement

The National Residence Hall Honorary (NRHH) is an organization, welcoming student leaders who have values of scholarship, service, leadership and recognition. Established in 1964, this organization is comprised of the top 1% of student leaders living in the Residence Halls. The growth and positive change the Eternal Flames Chapter of NRHH here at UIC continues to impact the residential community as well as its own members in many ways. Since Fall 2018, our organization has maintained close to the full capacity of members possible and has realigned our events and initiatives to better represent the pillars that uphold the meaning of NRHH: service, leadership and recognition. The Eternal Flames Chapter in addition to hosting volunteer events like marathons has partnered with community members to engage in service projects. Recognition has become more emphasized with a new system to submit Of The Month’s (OTMs) and implementation of 9 Random Acts of Kindness which takes place throughout our residence halls. Our organization with the guidance of advisors is student led and provides multiple opportunities for students to get involved and experience personal and professional growth. Our students are the top 1% of student leaders living in the residence halls not only through their own values and characters, but through the contributions and positive impact they collectively have on their residential community as the Eternal Flames Chapter.

338. Said, Hani

Arab Americans of UIC and their Use of Herbal Tea Remedies

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Community/Global Perspective and Diversity
Herbal remedies can have roots back to several generations in a family or to an entire culture, be it due to effectiveness or simple availability over time. This is especially true in Middle Eastern cultures and families, where from personal experience I have seen several families own a sizable herb garden to use for many illnesses and health problems. This has inspired a question which I would like to delve further into for my research project. I am interested in the relationship Arab-American students and parents here at the University of Illinois at Chicago community have with using traditional herb-based tea medicines to treat various health-related problems. I will accomplish this by survey of students at UIC, asking them to identify whether they or their parents use herbal remedies at home to treat some small health problems. By doing so, I would like to see how these traditions of using herbal remedies stand today in this community, compared to its cultural roots.

339. Sim, Joseph Gabriel

How Three Letters Influenced the Next Chapters of My Life

Undergraduate Presentation Type – Impact Oral Presentation/Impact on Career Development/Leadership and Involvement

This presentation will be about how Greek life here at UIC has helped me develop skills that will be key in my future career, centered around my experience in the Association of Fraternal Leadership & Values (AFLV) Conference this semester. Misconceptions about Greek life, benefits and costs of being in Greek life, and how Greek life has developed and prepared me for the future will be some of the topics presented.

340. Strom, Joseph and McNamara, Reilly

The Necessity of Preemptive Legislation Concerning the Legal Status of Extraterrestrials

Undergraduate

Presentation Type – Impact Poster/Impact on Community/Civic Engagement and Social Justice

“The realm of policy and legislation is rooted in response to immediate needs. When the immediate need is not present, as we see in the case of legislation and protocol for extraterrestrial beings, then the issue simply is not addressed. This is
compounded when the issue is so easily brushed aside to the realm of Hollywood or eccentric stargazers. While it may seem absurd at first glance, extraterrestrial legal status is a relevant issue; so long as we actively search for extraterrestrial life, as we have shown in this study is the case, we need to accept the possibility of success in that search. When we accept the possibility—however small—of success, then we need to be legally ready for the consequences. This presentation reports on research including existing literature regarding extraterrestrials and potential legislation for them. Spanning treaties, xenology, metalaw, philosophy, and more, we came to the consensus that action needed to be taken. We personally have tried to address this need in our own unique way based on our findings. The steps we have taken in order to get policy on the table are replicable and may yield further results in the future. Civic engagement is addressing an issue of public concern and this is what we have intended to do. Ultimately, we hope this can start a conversation moving the idea of defining the legal status and protocol around extraterrestrials from the fringe and science fiction into a genuine issue of legitimate relevance worth considering amongst national and international governing bodies.”

341. Subramanian, Vidya

Lessons Learned from Greek Life

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Self/Leadership and Involvement

I became a sister of Delta Xi Phi in the fall of 2017 and it was the one of the best decisions I have ever made. Being an active member of fraternity and sorority life has pushed me out of my comfort zone and ignited growth and change within me. I have held many positions throughout my time in various tiers of leadership and through that experience I have learned valuable lessons that not only improved my greek leadership, but they were also relevant in other aspects of my life. This past February I was given the opportunity to attend a national greek leadership conference where I got to meet greeks from all over the country and it widened my perspective.

342. Talpa, Toma

The American Dream through the Eyes of Immigrants

Undergraduate
Presentation Type – Impact Creative Presentation/Impact on Community/Global Perspective and Diversity

What is the American Dream? How one can define it? Does this dream relate only to American citizens or to immigrants as well? The American Dream is not coming to U.S. and living an easy life. The American Dream is achieved through persistence and will to succeed. For my Capstone Project I’m planning to do a small documentary about the American Dream and how immigrants perceive this dream, what were their challenges, their responsibilities, their choices to go to school to evolve themselves and succeed. There are people who immigrated in U.S. and chased their dreams and had a successful career while having same responsibilities as citizens do. What will be new about this project is probably the subject, the combination of participants living in U.S. that are from different parts of the world, regardless of their status, their successes and failures related to the American Dream. Their responses will be a voice for others to push forward to achieve this dream and be an example for others. Immigrants are judged sometimes because there’s this idea that they don’t contribute to the economy of the country, but immigrants have rights and responsibilities to follow, as well, to achieve their American Dream. The small documentary will depict this journey.

343. Tan, Jeffrey

Lessons on Developing Early Professional Competency through Volunteering

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Career Development/Career Development

Clinical observation hours are considered a major part of program admission requirements for many healthcare professional program applicants. With prudential interest in competitive program admissions, many pre-health undergraduates seek to accumulate clinical observations hours through volunteering in the various healthcare settings. However, these opportunities can be mistreated as a means to an end, rather than true service learning experiences. Volunteering in the healthcare setting should, in the right perspective, foster early professional competency as a service learning opportunity. Early exposure and practice of basic professional competency in the healthcare setting can foster understanding and development in areas such as: inter-professional collaboration, patient/client centered care, individual proficiency, and communication. Internalizing these concepts into volunteering are essential components to the career development of aspiring health
professionals. This presentation provides specific examples in the inpatient rehabilitation setting, primarily focused on the Pre-Physical Therapy track. Career development and professional growth should be emphasized through volunteering opportunities in the pertinent healthcare settings, for whichever professional track that may be.

344. Thakkar, Astha

Understanding Central Arguments in Post-Colonial Studies through Design Methodologies

Graduate / Professional

Presentation Type – Impact Creative Presentation/Impact on Self/Career Development

My thesis looks at graphic design as a platform for coding and decoding core arguments in post-colonial studies. I chose to focus on this field of study because my interest lies in understanding cultural and literary production in the global south as well as both the current political culture and the political evolution of former colonies in the East. The key approach was to apply design methodologies in understanding what post-colonial scholarship has to say about the culture, social framework, and political and historical evolution of the global south. Through a collection of visual studies I seek to profile complex critical positions by applying experimental design methodologies that connect the field of design to broader social and political arenas. I am especially interested in figuring out how design methods can help in working out complex theoretical positions. The research project examines the claims that Edward Said, an influential, terrain-shifting post-colonial scholar, makes in his book ‘Orientalism’. I compare and contrast his key arguments to the claims made by another acclaimed twenty-first century scholar, Vivek Chibber. While both authors incorporate theories within the field, they support two polar views on the evolution of the global south. By examining these two scholars and their varying viewpoints, I attempt to bring to light the strengths and weaknesses of each perspective. Such conflicts of opinions are ripe for a design intervention. I tried to foreground some key arguments through typographic operations and by devising methods to reveal ideological flaws in a historically specific and troubled text. In a moment of global political, economic and social chaos, my thesis is a place for actions, reactions, interactions and counteractions that will hopefully translate into criticism, proposals, and speculative projects. I am interested in looking at how these complex notions of difference and identity are relevant today.
345. Thomas, Theresa

The Fight Continues: From Restrictive Covenants to Collective Resistance and Organizing, Uptown Activist March Onward

Undergraduate

Presentation Type – Impact Creative Presentation/Impact on Community/Civic Engagement and Social Justice

Although currently undergoing gentrification, Uptown has a multiracial history. As a formally affluent neighborhood and entertainment district, Uptown became a working-class, immigrant neighborhood by the 1950s and 60s. In the 1940s, The Central Uptown Chicago Association raised $14,000 dollars to enact a restrictive covenant, which limited African Americans to live on one block, in efforts to contain migration flow. The following decades were proceeded by a great migration of low-income Appalachian whites, Japanese-Americans who were relocated after being held in internment camps during WWII, Latino migrants who were displaced from gentrified neighborhoods to the south, working-class Native Americans, Vietnamese and Cambodian refugees displaced by US fought wars in Asia, and African-Americans migrants from Jim Crow South. As the neighborhood underwent racial and socioeconomic shifts, a rapid decline toward public investments, infrastructure and housing followed. Uptown grew increasingly blighted, but the spirit of activism arose amongst residents, creating the culture of resistance that Uptown is known for today. Various multiethnic organizations arose and began to address police brutality, depilated housing conditions, abusive and overreaching polices implemented by welfare authorities. Additionally, these organizations created lunch programs, and community healthcare. During the 1960s and 70s, they fought against urban renewal projects such as the building of Truman College considering it construction displaced 500 families though eminent domain and the “arson for profit” that ensued. Under current Alderman James Cappleman, long time residents are being pushed out of their homes as funds originally designate towards developing public spaces and improving conditions for current residents (TIF funds), are repurposed for private ownership. The fight continues as long-standing organizers continue to empower working-class members of their community to resist displacement.

346. Ting, Elizabeth

Effective Mentoring Methods and Why Mentoring is Important

Undergraduate
Presentation Type – Impact Poster/Impact on Community/Leadership and Involvement

A synthesis and real life experience of why mentorship is important especially for women and minority groups. It consists of a literature review and a reflective impact of mentorship at UIC College Prep. This study reinforces the impact of mentorship in today's society and the importance it brings to the community. The purpose of the study is to bring awareness to of the positive impact that mentorship brings.

347. Udoetuk, Stella

Peer Health Exchange: A Peer Model for Educating Young People about Health

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Community/Civic Engagement and Social Justice

According to the Center for Disease Control's 2017 Youth Risk Behavior Surveillance, 4 in 10 teenagers are sexually active and of those teenagers, 46.2% did not use a condom in their last sexual interaction. The study also revealed that 13.5% of teenagers reported binge drinking and 3 in 10 teenagers reported feeling sad or hopeless almost every day for 2 weeks in a row, with 2 in 10 students who had seriously considered suicide. Comprehensive health education that addresses sexual health, substance use, and mental health is key for young people to make healthy decisions. Illinois is one of the 24 states in the US that mandate sex education. However, health education, in general, can not only vary from state to state but also from school to school. This lack of regulation allows students to slip through the cracks unable to have a full understanding of their changing bodies and social pressures which often leads to risky and underinformed behaviors. In partnership with Peer Health Exchange (PHE), a national organization that teaches health education to underserved high school students using a peer model, these three aspects of health are addressed. In particular, Benito Juarez High School in the Pilsen neighborhood of Chicago is one of the schools the UIC PHE chapter teaches. One of the workshops taught is focused on sexual health aims at educating students about the importance of STI testing and the effectiveness of various birth control methods and STI protection. Through an assessment given to the student before and after the workshop, it was shown that students were able to grasp key workshop concepts such as, "Which is the least effective birth control method?"
Data obtained from the self-report surveys indicated that students had a better understanding of sex and STI and pregnancy prevention.

348. Vergara, Katherine

What is After Polio? Priorities & Adaptability in Angola, Ethiopia, Kenya, Nigeria, Somalia and South Sudan

Graduate / Professional

Presentation Type – Impact Oral Presentation/Impact on Community/Global Perspective and Diversity

The final chapter of polio is not complete. But the task of adapting the polio infrastructure is upon us now. The challenge before us lies in defining the next health priority to share. Actively listening to stakeholders revealed a more complex priority. It was not one specific disease. Based on the framework of Implementation Science to predict implementation success, this study aimed to identify public health priorities to which the built polio infrastructure should be applied, and opportunities of how to adapt to future health initiatives. Qualitative interviews with polio stakeholders were analyzed for overall trends, by specific socio-ecological level, and by individual country context. Clearly apparent, “Health Systems & Infrastructure” and “Routine Immunization” were the most frequently occurring priorities that stakeholders identified. Challenging the historic tactic, stakeholders called for a broader systems’ bolstering and a more macro-public health approach to be presumed. The adaptability findings closely reflected and further informed the findings of the shared priorities. Examples and opportunities were associated with the overall identified priorities: Health Systems & Infrastructure and Routine Immunization. Polio stakeholders were aware of and primed for adapting the polio infrastructure to other health priorities. They recognized and even suggested a less siloed approach to public health, harkening to overall health systems bolstering. Recommendations were aligned to the prodigiously shared priority of stakeholders interviewed; to improve Health Systems & Infrastructure, explicitly to address improving the capacity of health monitoring and surveillance. More specifically, while focusing on improving overall Health Systems & Infrastructure, a recommendation was made to task-shift the built polio infrastructure to address routine immunization, pivoting away from a one disease focus. Lastly, a recommendation was made to encourage partners to look more broadly at how polio infrastructure legacy planning can affect larger societal needs.

349. Vezzetti, Krystal
Community Stakeholders as Research Partners: The Assessment of Youth, Parents, Community Stakeholders, and Community Leaders in Creating Relevant and Desired Programming for Local Youth Centers

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Community/Civic Engagement and Social Justice

Youth development centers provide programming which will support youth to mature in character development, receive empowerment to learn new skills, and encouragement to engage in healthy living. The Learning and Evaluation Department at YMCA Metro Chicago conducted a community needs assessment on the West Communities YMCA and the Rauner YMCA to assess the most prevalent youth needs; these needs will guide the repurposing of those specific centers for programming as community youth centers. The researchers distributed surveys to the current members of the clubs, conducted an environmental scan to examine already established local youth serving locations, and hosted focus groups with local youth, parents, and community leaders to collect qualitative data. This qualitative data revealed the concerns of the local youth and parents and desired programs in the new center. The outcomes will be assessed for the primary needs of local elementary age youth and caregivers such as sports, STEAM programs, social emotional learning, and mentors. At impact day, the data will be complete for West Communities YMCA with a draft of pilot programming; the community needs assessment and research will still be ongoing for the Rauner location.

350. Violi, Federica

Understanding the Role of the Conserved Kinase PIG-1/MELK in Tubulogenesis

Undergraduate

Presentation Type – Impact Poster/Impact on Self/Career Development

Biological tube formation, or tubulogenesis, is a conserved process critical for the formation and function of most organs. We use the C. elegans (nematode worm) excretory canal (ExCa), a single-cell tube, to discover and study new conserved regulators of tubulogenesis. Kinases are central regulators of diverse signaling pathways and cell biological processes. The C. elegans genome encodes ~500 protein kinases, of which 248 are conserved with humans. In a previous genetic
screen from our lab, focused on these conserved kinases, seven new kinase regulators of ExCa tubulogenesis were found. The main goal of this project is to define the role of PIG-1, one of these seven new kinases. The human homolog of PIG-1 is called MELK, and its role is not well understood, although high MELK expression is correlated with aggressiveness and poor prognosis for several types of cancer. One possible target of PIG-1 is the protein EXC-6; a worm homolog of the human protein INF2, which is mutated in congenital kidney disease and Charcot-Marie-Tooth neuropathy. The ExCa phenotypes seen in exc-6 mutants are almost identical to those seen in pig-1 mutants, leading us to hypothesize that exc-6 and pig-1 function in the same pathway. To test this hypothesis we have mapped a transgene expressing fluorescently-tagged EXC-6 (mCherry::EXC-6) and are crossing this construct into an pig-1 null (0) background to . We will analyze the effects that loss of pig-1 has on mCherry::EXC-6 localization using confocal microscopy. We have also mapped the genomic location of several other transgenes expressing fluorescent proteins that mark different sub-cellular compartments (e.g. Golgi, ER and Mitochondria) and we will cross these into pig-1(0) and exc-6(0) to further analyze the common, or different, effects that loss of these proteins have on cellular architecture.

351. Violi, Federica

Increase Mental Health Awareness Among College Students

Undergraduate

Presentation Type – Impact Oral Presentation/Impact on Community/Leadership and Involvement

Our project aims to promote awareness of mental health and disability and increase campus resources for students and faculty at the University of Illinois at Chicago. Furthermore, we are catalyzing the discussion of mental health to result in actionable system change. We are creating an environment supportive of the mental health of its community at UIC through a series of workshops, trainings and resources. We are creating open workshops related to mental health topics like depression and anxiety, commonly faced by students. To enhance the opportunities being offered, conversations surrounding mental health will be facilitated during meetings to connect peers with one another, create a sense of belonging and community at UIC, and come up with solutions to these issues. The positive impact expected will represent the contributions to the conversation by students and faculty and the increase in participation throughout the semester. Students and faculty have had the opportunity to participate in trainings related to mental health. Free mental health first aid trainings certify participants in understanding and supporting the symptoms of mental health conditions. Five
trainings have been made available to the UIC community from February to May with the goal of certifying 200 people. Participants in this training series can eventually become certified instructors in this curriculum and offer the trainings throughout campus themselves, creating a trickle-down-effect. Students have been able to recognize the impact of community partnership through trainings and workshops which has and will increase awareness and resources. We are also creating a prototype of an app targeting improvement of the wellbeing and mental health of UIC students. The mobile application is be a community building strategy for students who share similar experiences with mental health and offer resources for stress relief, time management and organization, and mindfulness.