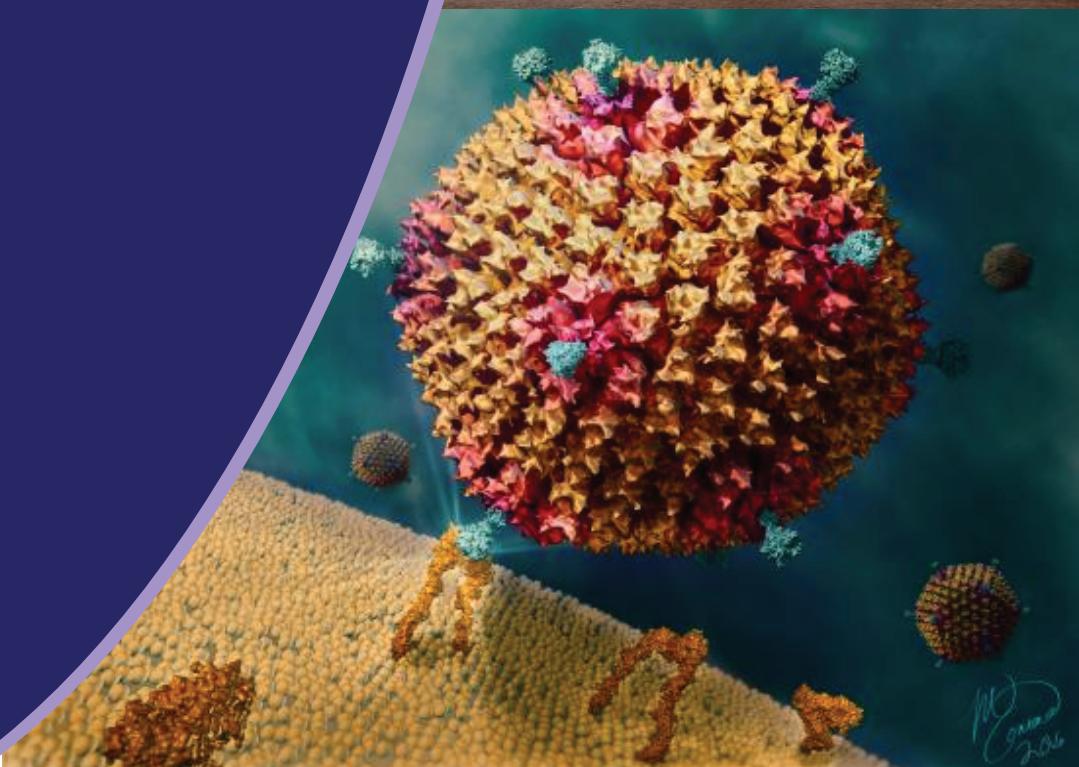
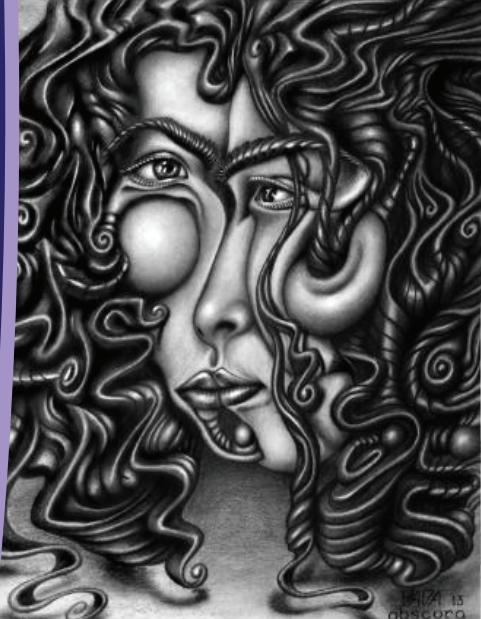


2017 UIC

UIC | STUDENT RESEARCH FORUM & IMPACT DAY

Undergraduate • Graduate • Professional

April 3rd, 2017
1:00 PM - 5:00 PM
UIC Forum
725 West Roosevelt Road
Chicago, IL 60608





Undergraduate • Graduate • Professional

**STUDENT RESEARCH FORUM
&
IMPACT DAY**

APRIL 3, 2017

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
3:30 to 4:30 pm	Reception and Keynote
4:30 pm	Awards Presented

Acknowledgements

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Oncolytic Adenovirus, Melanie Conrad, Biomedical Visualization

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Student Research Forum

Poster Presentations

1. Abdul Dayem, Tawfik and Iriarte-Diaz, Jose

Dental Occlusal Topography in Primates

Undergraduate - Biological Sciences

Hypothesis: The molar morphology in primates is correlated to feeding behavior, regardless of phylogenetic group. Objective: To evaluate the differences in molar occlusal surface morphology between taxonomic and dietary groups in primates. Methods: Occlusal molar morphology from a diverse group of primates was obtained from freely-available CT repositories. For each segmented molar, a series of topographical parameters such as surface area, the relief index (RFI), Dirichlet Normal energy (DNE), and the orientation patch count (OPCR) were calculated. Statistical analyses were performed for each variable to assess the effect of diet and taxonomy. Results: There was significant amount of variation in the entire variable between the groups. DNE is the best predictor of the dietary category, but with substantial differences between taxonomic groups. Overall, no single variable is fully effective to characterize feeding behavior, but using a combination of topographical parameters it is possible to provide an adequate prediction of the dietary habits in primates. Conclusions: Tooth occlusal surface topography is highly correlated to diet but it is also confounded by taxonomic effects. A more widespread analysis including more taxa and dietary categories are needed to better understand the relationship between tooth form and function in primates.

2. Adil, Abdullah; Gutgesell, Lauren M; Ratia, Kiira; Tonetti, Debra A and Thatcher, Gregory RJ

Combination Therapy Targeting Treatment-Resistant, Hormone-Responsive Breast Cancer

Undergraduate - Chemistry

Breast cancer affects 1 in 8 women throughout their lifetime and is the second leading cause of cancer-related death in women in the United States. Approximately 70% of all breast cancer tumors express the hormone receptor, estrogen receptor α , (ER α) which, in cancer, is activated by estrogens binding to ER α , initiating a proliferative signaling cascade, leading to aberrant cell growth. The standard of care for ER-positive (ER+) breast cancer in premenopausal women, tamoxifen, can prevent estrogens from binding to ER α by acting as a selective ER modulator, and thereby inhibiting growth of the tumor. Unfortunately, up to 50% of tumors are initially refractory or acquire resistance to tamoxifen within five years of treatment. Currently, resistant tumors are treated with more aggressive treatments, such as cytotoxic chemotherapy, which stresses the need for an alternative treatment.

In this project, the use of novel adjuvant treatments through combination therapy has been explored in an attempt to circumvent or overcome drug-resistance. Following validation

of a high throughput screening (HTS) campaign targeting tamoxifen-resistance, hits are analyzed and characterized for use in combination therapy. In vitro models of tamoxifen sensitivity and clinically acquired tamoxifen resistance are used to select for compounds with selectivity against resistance. These cell lines maintain ER expression, but utilize other growth signaling pathways for proliferation. Due to the fact that ER expression remains, ER ligands such as selective ER degraders (SERDs) are still effective in tamoxifen-resistant tumors. Using these models, combination therapy can be optimized with effective hits and SERDs.

3. Ahmed, Maleeha

Collection of Interface Frameworks for the WEVOTE Method

Undergraduate - Computer Science

Microbiome studies have been shown to be essential in understanding the interactions between the host genome and the body's microbial ecosystem. WEVOTE (WEighted VOTing Taxonomic idEntification) is a recently developed software that classifies the microbial sequence reads. WEVOTE outperforms all the other existing metagenomics classification methods in terms of precision and sensitivity. However, WEVOTE requires being run on a machine with a very large memory. Additionally, the current WEVOTE implementation only supports UNIX operating systems and can be executed using command line which makes researchers with limited computer skills not able to use WEVOTE. To overcome these obstacles, we propose two different interface types for the WEVOTE package: a) Web Server, and b) Cloud Computing snapshot. The implemented Web Server will make WEVOTE accessible via a web browser. The web server will be hosted on the UIC Extreme supercomputer. While the web server is a very feasible option, it suffers from the scalability issue as the UIC Extreme is only available to UIC personnel and cannot be used by any other non-affiliated member. To make WEVOTE accessible to anyone, a cloud computing package will be developed where the users can allocate computing resources on a pay-as-you-go basis. The IP address is used to manipulate a computer in the "cloud." It can be used to implement WEVOTE and provide the user with unlimited access. In summary, Web Server and Cloud Computing have positives and negatives that make it favorable yet unfavorable to implement WEVOTE. The goal of using these two methods is to maximize the efficiency and accessibility of WEVOTE.

4. Ahmed, Masera and Bottoms, Bette L.

Proposing a 20-Year Comparison of Clinicians' Experiences with and Attitudes Toward Repressed Memories

Undergraduate - Psychology

During the 1980-90s, many claimed to have recovered formerly repressed memories of child sexual abuse. These memories sometimes surfaced in therapy, after victims searched

for answers to common problems like depression. Despite the lack of scientific evidence for repression, many clinicians believed and encouraged their clients' claims. Some of the memories might have been true, some were surely not. If not true, where did these "false memories" come from? Could some have been suggested to the victims by therapists, who might have used suggestive techniques and held unscientific theories about the way memory works? Media and scientific coverage of repression has dropped considerably over the last two decades. Have claims themselves dropped as well? Nationally, have therapists' techniques and beliefs changed over the last 20 to 25 years? My project is writing a full grant proposal to the National Science Foundation to fund a longitudinal study of therapists' attitudes, techniques, and experiences with repressed memories now and, by comparison, two decades ago. Specifically, I propose a follow-up survey to a survey done in 1995 by Professor Bottoms and her colleagues. In 1995, they found that many therapists (about 47% of the sample) had encountered cases, and about 75% of the therapists believed in their clients' repression. A minority endorsed unscientific beliefs about therapy, which was correlated with seeing higher numbers of cases in their practices. The purpose of my work is to write a detailed proposal to examine the beliefs and practices of current therapists regarding repression and compare to the sample from 1995. I hypothesize that fewer therapists will believe in the validity of repressed memories and encounter these cases in their practices today as compared to two decades ago, probably because of advancements in the science and practice of psychology.

5. Aktas, Ozge Nur; Turturice, Benjamin A.; Ozturk, Ayse B.; Kizilkan-Uslu, Nuray; Sackesen, Cansin; Perkins, David L. and Finn, Patricia W.

Influence of the Microbiome on IgE and Non-IgE Mediated Food Allergies

Graduate/Professional - Medicine

Influence of the Microbiome on IgE and Non-IgE Mediated Food Allergies

Background: The prevalence of food allergies in children has been increasing in last decade. IgE mediated food allergy (characterized by increased serum levels of food specific Ig-E, gastrointestinal symptoms, and anaphylaxis as a most severe reaction) is more common, yet non-IgE mediated food allergy (characterized mostly by gastrointestinal symptoms) is increasingly being diagnosed as early as first week of life. Recent studies show changes in gut microbiota with food allergies. Whether gut microbiota may differ between IgE and non-IgE mediated food allergies has not been determined. **Hypothesis:** IgE mediated food allergy differs in microbial composition from non-IgE mediated food allergy. **Methods:** Stool samples are collected from a pediatric population (age 1 month to 2 years). The subjects are healthy or diagnosed with allergic gastrointestinal disease by a physician. DNA was isolated from healthy (n=4), non-IgE mediated food allergy (n=7) and IgE mediated food allergy (n=5) children. 16s rRNA qPCR was used to assess the quantity of bacterial DNA. Whole genome shotgun sequencing was applied to identify the composition of microbial DNA. Samples were sequenced to an average depth of 3.1 ± 0.8 million paired end reads and 0.9 ± 0.2 gigabase pairs. **Results:** Initial comparison of bacterial abundance between food allergy subjects and controls revealed similarity between healthy and food allergy children. Alpha

diversity did not differ between groups. 3 distinct clusters of infant gut microbiome were demonstrated. Distribution of phyla and species differed between groups and clusters. Although major phyla found in both groups and clusters were similar, species level differences were shown in groups and clusters. Conclusion: Bacterial abundance is similar between food allergy and healthy subjects. In depth analysis of whole genome sequencing to reveal differences between IgE vs non-IgE mediated food allergy children is demonstrated.

6. Alcantara, Paola

Voices of Latino families and Special Education

Undergraduate - Education

The purpose of my capstone was to create awareness in the educational community, specifically about the latino community on their perceptions and/or beliefs of the special education their diverse learner child is receiving. I interviewed four different sets of Latino families (3 Mexican, 1 Ecuadorian) on their perceptions of the education their child is currently in and the parent/guardians relationship with the diverse learner teachers. I also interviewed 3 diverse learner teachers on how they feel about the special education program at their school and their relationship with the parents/guardians. These interviews were done at the school I am currently student teaching at since September and no names were used and I explained the purpose to both parents and teachers. The school is a dual-language school meaning that some subjects are taught in Spanish and some in English in order to create biliteracy and strengthen bilingualism. My goal was to bring to light voices of latino families on a type of education that is always controversial, but so highly needed and important. I plan to write my paper and poster analyzing the data I gathered.

7. Allababidi, Nur; Collins, Nicole; Van Eldik, Linda; Tai, Leon and Ladu, Mary Jo

A Novel Hypothesis for Alzheimer's Disease Developed in a Mouse Model is validated in Human Brain

Undergraduate - Anatomy and Cell Biology

Alzheimer's disease (AD) is the most common form of dementia, representing a significant social and financial burden. The greatest genetic risk factor for AD is the APOE4 allele of apolipoprotein E (apoE), which increases risk up to 15-fold compared to the more common APOE3 allele. Amyloid-beta levels, both deposited as amyloid and soluble species as oligomeric amyloid-beta ($\text{oA}\beta$) and amyloid-beta42 ($\text{A}\beta42$), are higher with APOE4 than APOE3, evidence that apoE isoforms differentially modulate the aggregation and clearance of amyloid-beta. We have developed the mechanistic hypothesis that AD pathology and APOE4 cause a reduction in apoE lipidation, resulting in inefficient clearance of soluble amyloid-beta, synaptic loss, memory/cognitive deficits, and dementia. Using human brain samples of control and AD with genotypes APOE3/3,

APOE3/4, or APOE4/4 from the University of Kentucky, we demonstrated that lipoprotein-associated apoE is significantly lower in AD patients with the APOE4/4 genotype vs. APOE3/3 AD patients and all genotypes in the control cohort. Soluble A β levels are higher in the AD cohort compared to the control cohort, and are highest in AD patients with an APOE4/4 genotype. Finally, apoE/ amyloid-beta complex levels are higher in both control and AD subjects with APOE3/3 than complex levels in both control and AD subjects with APOE4/4. These results are consistent with the hypothesis that APOE4 causes a reduction in apoE lipidation and apoE/ amyloid-beta complex, resulting in inefficient clearance of soluble amyloid-beta, synaptic loss, and dementia. Together, these results suggest apoE lipidation as a potential therapeutic target for APOE4-induced AD risk.

8. Allen, Margaret G. ; Kabir, Minoo and Ozevin, Didem

Next Generation Pipelines: Utilizing Acoustic Metamaterial for Structural Health Monitoring

Undergraduate - Civil and Materials Engineering

Infrastructure both old and new must be monitored for changes to its physical structure; often, damage to bridges and pipelines develops imperceptibly to the human eye as the structure ages until an abrupt failure occurs. Structural-health monitoring (SHM) methods exist to prevent these situations. One passive method is Acoustic Emission (AE) where sensors are attached to a structure and measure the acoustic elastic waves present; when a crack begins to form in a structure, its energy disperses as elastic waves which propagate through the material. While AE can lead to early damage detection, current limitations come from signal decay due to wave attenuation over long distances, meaning more sensors must be placed around the structure. Acoustic metamaterial offers an improvement to AE methods. Metamaterials are materials engineered in purposeful ways to enhance certain properties. Acoustic metamaterials make use of a composite structure of periodic units which mathematically act as phononic crystals (PC). PCs block particular frequencies of propagating waves based on their material and geometric design. Additionally, a waveguide can be included within the PC which can redirect and strengthen the blocked frequency within a predetermined path. The application of this technology in SHM would allow for a newly installed structure to have fewer permanent sensors “tuned” for both its usual frequencies and the PC bandgap. When cracks form, the waves of wide-band frequencies released will pass through the integrated PC structure; a sensor positioned at the PC waveguide will measure an increase in energy, alerting engineers to the damage. This research investigated optimal material and geometry of PCs for desired frequency ranges numerically; the results were then experimentally corroborated on both flat plates and circular pipes, structurally simulating acoustic metamaterial on bridges and pipelines, respectively.

9. Altaher, Hadeel

Women's Motivations to Wear Makeup and It's Effects on Self-Esteem

Undergraduate - Psychology

Cosmetics play an impactful role in today's society. With the worldwide reach of social media, women everywhere are exposed to images of what seems to be a new standard of beauty: a full face of makeup. A two-part research study was conducted to better understand this topic. The first study's purpose was to understand women's motivations to wear or not wear makeup. 258 women ages 18-65 were recruited in person and through social media and text messaging to participate in a questionnaire. The results showed that the majority (approximately 75%) of women who do not wear makeup prefer their natural selves over their made-up selves or do not wear it because they do not have time to put it on. The majority (approximately 80%) of women who do wear makeup do so because they felt better about themselves and more comfortable with makeup on, but they did not feel societal pressure to wear it. They also reported enjoying the process of putting makeup on. The second part was a scenario-based experiment aimed towards finding whether there is a relationship between makeup and self-esteem. 108 female participants ages 18-62 were assigned to two different groups: makeup and no makeup. Participants were presented with a scenario in which they were either wearing makeup or not and asked to complete the State Self-Esteem Scale Questionnaire. I hypothesized that women in the makeup group would have higher self-esteem than those in the no makeup group. The results of the study showed no significant relationship between the amount of makeup worn and self-esteem.

10. Amaravadi, Sankhya; Bottoms, Bette; Burke, Kelly and Jones, Tayler

Jurors' Perceptions of Animal Abuse

Undergraduate - Psychology

Animal abuse is so linked to both domestic violence and child abuse that intentional cruelty towards animals is considered by social services, police, and veterinary professionals as a potential indicator of domestic violence. In the past decade, there has been growing concern with animal welfare in the United States, which has led to an increase in laws aimed at punishing perpetrators of animal abuse, due in part to the link between animal and child abuse and domestic violence. The burden of prosecuting animal abuse cases falls to courts and the legal system. However, with no rigorous scientific studies, neither prosecutors nor defense attorneys have anything more than intuition to guide them as they empanel juries and prepare cases for trial. Studying jurors' reactions to animal abuse is therefore practically important and needed in both the psychological and legal fields. The purpose of the current study is to provide insight into how jurors approach animal abuse cases, and the factors that influence their perceptions, attitudes, and judgments. In this study, I examine whether mock jurors' gender and their identification with gender roles influence their judgments and perceptions of guilt when presented with cases of animal abuse (a man beating a cat). I hypothesize that, compared

to men mock jurors, women will be more likely to want to convict the perpetrator, and to consider the act more morally wrong. This will parallel findings in research on jurors' perceptions of child abuse, where there are consistent differences between men and women.

11. Anikamadu, Ifunanya

Redefining Black Activism?

Undergraduate - Political Science

For years, when discussing movement politics, or specifically Black movement politics, the Civil Rights Movement (1954-1968) is always presented and highlighted in the conversation. But that is also where the conversation stops. There is a new movement rising called Black Lives Matter which is a prominent and popular subject in news media, social media, and in everyday conversation, but it has still not been able to hold a place in history to be discussed alongside the Civil Rights movement in the academic scene. Why is that? The Civil Rights Movement (CRM) (1954-1968) encompassed social movements in the United States whose goals were to end racial segregation and discrimination against African Americans and to secure legal recognition and federal protection of citizenship rights outlined in the Constitution. The Civil Rights Movement was a response to the post-Reconstruction regime that practiced racial segregation, disenfranchisement, exploitation and violence against African Americans. African Americans rejected this regime with resist and sought better opportunities through lawsuits, new organizations, political redress and labor organizing. The Black Lives Matter Movement (BLM) campaigns against violence and systematic racism toward African Americans. BLM regularly protests police killings of African Americans and also broader issues of racial profiling, police brutality, and racial inequality in the United States Criminal Justice System. The Black Lives Matter Movement was originally a hashtag on social media as a response to the acquittal of George Zimmerman in the shooting and death of Trayvon Martin, an African American teen, in 2013. The movement became nationally recognized in 2014 for its street demonstrations following the deaths of Michael Brown, resulting in protests and unrest in Ferguson, Missouri, and Eric Garner in New York City. Showcasing the progression of black movement politics through the compare and contrast of The Civil Rights Movement and The Black Lives Matter Movement, The Black Lives Matter Movement is reshaping and redefining black movement politics and black activism.

12. Anninos, Evangelia-Maria

Venus in Painting: The symbolisms of Venus from Antiquity to the 19th century

Undergraduate - Art History & Classical Studies

The Roman goddess of Classical antiquity Venus, and her equivalent Greek goddess Aphrodite, has been a source of inspiration in painting for hundreds of years. The earliest

depictions of the goddess appeared during Classical antiquity. Then, the figure of Venus was rediscovered by the Renaissance artists of the 15th century. Usually associated with love and beauty, Venus has been a prevalent figure in painting since the Renaissance. My research project will examine several different symbolisms associated with the representation of the goddess. Paintings of Venus would have served as religious imagery through Classical antiquity, but when she was rediscovered by Renaissance artists in the 15th century, she became a symbol for a range beliefs, ideas and institutions, coming to personify peace, love, nobility, family, marriage, and lust. As an idealized nude, she stands for erotic imagery. My sources include museum and exhibition catalogs, academic journals and books. Through a selection of paintings drawn from Classical antiquity to the 19th century, I intend to study in depth a figure that first emerged in antiquity and has been predominant in visual arts since the 15th century.

13. Aranda, Lorenzo

How Professional Wrestling Predicted The Results of The 2016 Election

Undergraduate - Honors

This article seeks to explain the results of the 2016 election through a combination of two lenses. The first being the Hegelian Dialect created by German Philosopher Georg Wilhelm Friedrich Hegel. The second being through the lens of professional wrestling and their use of Pathos and Ethos. It is through this use of timing and Donald Trump's use of professional wrestling techniques that he was able to win the 2016 election.

14. Arban, Crissel Marie

The Impact of Ageism and Enculturation on Young Adult Filipino American Preferences for Elder Care

Undergraduate - Honors

Addressing the needs of an increasingly diverse aging population requires attention to group-specific cultural factors that influence eldercare as well as differences in these factors across generations. Existing research suggests that modernization may lead to changes in traditional cultural values that benefit elders. This project examines how ageist beliefs & enculturation (adherence to traditional cultural values) in Filipino American young adults relate to their preferences and opinions regarding elder care and living arrangements. A total of 163 young adults of Filipino descent living in the Chicago metropolitan area completed a one-time online survey. This survey included questions about their degrees of enculturation, beliefs about aging, preferences for elder living arrangements, and their willingness to provide various types of assistance for their mother and father if their parent could no longer live independently. Differences in gender were found when studying relative levels of ageism based on an Ageism Consumption subscale and preferences for their parent's living arrangements. Although most males and females reported similar answers in terms of willingness to provide 5 different types of assistance,

the data suggests that females may be more likely to provide care and housing for their elder relatives in the future. Through modernization, higher levels of ageism along with lower levels of enculturation could lead to problems with eldercare since people exhibiting those trends may be unwilling to live with or interact with the elders in their household.

15. Awadallah, Tesneim

Dental Hygiene and Eating Habits of UIC Undergraduate Students

Undergraduate - Biological Sciences

Proper dental hygiene is important for preventing diseases and maintaining proper oral health. Establishing a good oral health care routine will prevent bad breath, tooth decay and gum disease. An unfortunate problem that occurs with a lack of oral hygiene is that there is an increased risk of acquiring serious health issues, such as hyperlipidemia, stroke, heart attack, etc. The purpose of the study was to identify if the eating and smoking habits of students was linked to proper daily dental hygiene. Twenty undergraduate students ranging from the ages of 18-22, attending the University of Illinois at Chicago, were asked a series of questions via an online survey. I hypothesized those students who ate unhealthier foods will have worse dental hygiene than students who eat less unhealthy food. The amount of healthy and unhealthy food ate per day was recorded along with smoking habits. The number of times per day students brushed and flossed their teeth was recorded along with visits to the dentist on average per year. 8 out of 20 students that ate more unhealthy food were found to have an improper dental care routine, as compared to students who ate less unhealthy food had proper oral health. Those 8 students brushed their teeth almost never to only once a day, along with flossing less than once a week.

16. Ayegbusi, Olubukola

Genetic Deletion of JNK3 Improves the Pathological Features of Huntington's disease in R6/2 Mice

Undergraduate - Anatomy and Cell Biology

Huntington's Disease (HD) is a fatal, autosomal-dominant neurological disorder that causes a progressive axonal degeneration and eventual neuronal death. Recent studies have indicated that cJun N-terminal kinase 3 (JNK3), a specific protein kinase isoform, plays an important role in the inhibition of fast axonal transport (FAT) in HD. Five mice per group (wild type, R6/2, R6/2-JNK3 -/-) were evaluated in this study starting at age P45. After the genetic deletion of JNK3 in R6/2 mice, we observed an increased survival rate and improvement of locomotor, behavioral, and neurological deficits. In nesting performance assays, the onset of deficits was delayed in the R6/2-JNK3 -/- mice. The latency to fall from an accelerating rod (Rotorod test) increased and the clasping score was dramatically reduced at the symptomatic stage. The mean survival rate was also significantly extended in the R6/2-JNK3 -/- mice. Collectively, the data in this study

shows a critical role of JNK3 in HD and could facilitate the development of therapeutic strategies aimed to slow the degeneration of brain axons in individuals with this disease.

17. Ayoub, Ameer

How America Got Worked by a Club Comic Hack

Undergraduate - Political Science

The role of comedians throughout history has often been difficult to define. From the early days of court jesters to the dirty joke philosophers we see today, comedy has had the most longevity of any art form. All styles of comedy exist to exchange ideas, and hopefully get laughs, while onstage. Through the use of humor in their speech, comedians are able to both question the established norms of society and challenge those norms in often radical ways. The power of comedy, while historically confined to nightclubs and late night television, was on full display throughout much of the 2016 United States election. Indeed, when investigating the election of the comedic phenomenon known as Donald Trump, one cannot ignore the influence of humor in his campaign. When analyzing the linguistic patterns of a typical Trump speech, he seems to behave more like a standup comedian than any politician in recent memory. The man who openly mocked every other candidate in his path found himself at the top of the Republican food chain thanks in no small part to his ability to insult and belittle those against him. His blatant disregard for any sort of political correctness, much like a comedian, made him irresistible to many American voters. By behaving in a manner more suited to a club comic hack than President of the United States, Donald J. Trump was able to secure the highest office in the most powerful country in all of human history. In many ways, the rise of Donald Trump to leader of the free world is so absurd, that only comedy can explain it.

18. Ayrempour, Sharzad; Coumbe-Lilley, John E.; Miossi, Lindsey; Erickson, Lauren; Choong, Abi and Angwarawong, Chanya

Preliminary Findings Comparing Temporal Phased Sport Psychology Programs for Team Sports

Undergraduate - Kinesiology and Nutrition

The purpose of the first investigation was to learn how coaches used a systematic approach to the psychological preparation of teams. The theoretical model of periodization (Bompa, 1999) and psychological skills training program (PST) for teams (Bacon, 1989) were the frameworks used to approach the study. The conclusions from this study drawn from the results of an Institutional Review Board (IRB) approved research protocol of 10 semi-structured coded interviews from head coaches of team sports competing in high school and college environments. Since 2003, the first author has worked at several national, world, and Olympic events and worked with teams ranging from one to four year periods utilizing the lessons learned from the initial

investigation. During the same period several studies have been conducted concerning the specific systematic temporal approach to PST delivery. The current IRB approved study replicated the semi-structured interview protocol of the earlier investigation using convenience and snowball subject sampling recruitment approaches. (N=10) College level coaches were interviewed. Analysis used thematic content analysis methodology (Boyatzis, 1998 & Creswell, 2012). Preliminary findings from the second study show that while there is a decrease in the amount of parts a season is broken up into, there is also an increase in identified primary skills for each part of the season. The results require further analysis to indicate second and third tier skills while increasing the geographic scope of the sample to be able to create a testable model framework.

19. Babu, Meghana and Jayaraman, Sundararajan

Acidified drinking water influences gut microbial composition without impacting the incidence of Type 1 diabetes in NOD mice

Undergraduate - Microbiology & Immunology

Provision of acidified drinking water has been reported to either reduce (Wolf et al. J Histochem. Cytochem. 2014; 62:237-250) or enhance (Sofi et al. Diabetes 2014; 63:632-644) the incidence of type 1 diabetes (T1D) in NOD mice. In contrast, we observed that both the incidence and tempo of T1D remained unaltered when female NOD mice purchased from the Jackson Laboratory were maintained on acidified drinking water in our facility. Amplification of bacterial DNA derived from mice using qPCR unraveled reduced proportion of the butyrate producing Akkermansia spp without modifying the representation of the segmented filamentous bacteria. Interestingly, acid water consumption enhanced the occurrence of Lactobacillaceae spp. The frequencies of twelve other microbial groups were not altered by the change in the pH of the drinking water. Thus, whereas administration of acidic drinking water could differentially alter the representation of certain gut microbial taxa, it did not ameliorate or exaggerate T1D. However, other maneuvers capable of manipulating the gut microbial composition may hold promise for correcting dysbiosis in an autoimmune environment.

20. Bader, Noor

The Relationship Between Resilience and Burnout Rate in the Intensive Care Unit (ICU)

Undergraduate - Nursing

Burnout is prevalent in the intensive care unit due to work-related stressors, in which resilience is an important trait to have in order to prevent burnout syndrome. Resilience is a psychological characteristic that enables one to thrive after being exposed to a traumatic event (Mealer, 2012). The purpose of the research question was to determine if there was a relationship between resilience and burnout rate in nurses in intensive care units.

Articles were retrieved via EBSCOhost and CINAHL, accessed through the University of Illinois at Chicago's online library databases. Articles that were chosen were relevant to the topic of interest and were published within the last five years. In addition, I have interviewed nurses from a Medical Intensive Care Unit in a University hospital to determine what they believe about burnout and their coping mechanisms that make them resilient or not. Results indicated resilience is an important characteristic in critical-care settings in order to cope with work-related stressors and prevent burnout syndrome. Research has also supported the feasibility and acceptability of resilience training in ICU nurses. High resilience indicated a lower prevalence of anxiety, depression, and PTSD, in which resilience training can help mitigate development of common maladaptive psychological symptoms. Despite limitations stated, resilience training is feasible and acceptable for nurses working in high-intensity settings to prevent burnout syndrome. Work-related stressors can heavily impact nurse's well-being in and out of the unit, thus causing psychological symptoms such as anxiety, depression, and PTSD. Since resilience is a trait that can be learned, preventative programs or interventions can aid in fewer distress symptoms, increase in job satisfaction, and decrease the high turnover rate of nurses in the ICU. In conclusion, there is a relationship between resiliency and burnout, thus warranting the need for resilience training in ICU nurses.

21. Balasubramani, Booma Sowkarthiga and Cruz, Isabel F.

Towards Semantic Geospatial Data Integration and Uncertainty Modeling for Underground Infrastructure

Graduate/Professional - Computer Science

The emerging area of Urban Informatics has opened up numerous opportunities for the exploration and understanding of urban infrastructure systems by enabling data-driven analysis and informed decision making. The advances in information, storage and sensing technologies have accelerated the availability of tremendous volume of public accessible data over the Internet. To make better use of such data and to identify the correlation between different factors affecting the urban settings, integration of geospatial data becomes necessary. Data integration is the problem of combining data residing at different sources, and providing the user with a unified view of these data. However, the availability of data in itself is not sufficient to bring the concept of data integration to its full potential. Primary reasons are that data come from disparate sources and are fundamentally heterogeneous. In the process of designing an intelligent data integration system, one has to address the problems of heterogeneity and uncertainty that comes with the data and multiple techniques involved throughout the process. Geospatial data integration involves combining two or more geospatial datasets to facilitate analysis, reasoning, querying, and data visualization. Some of the prominent challenges in the integration of geospatial data includes differences in scales, data formats, and uncertainty. My research aims at developing a semantic data integration framework for underground infrastructure, that addresses several types of heterogeneities in data. In particular, I envision the realization of a framework that can handle: (i) a wide variety of standardized (Example: Shapefile, GML, KML) and non-standardized (Example: Flat file, HTML

table) data formats; (ii) multiple spatial and temporal resolutions contributed by the nature of data and the data acquisition methods; and (iii) differences in vocabularies and schemas due to the differences in data model between organizations. My research also focuses on modeling and quantifying uncertainty precisely, with special emphasis on geospatial data integration.

22. Barodia, Vyoma and Dubois, David

Mediation Analysis between Mentoring Effects on Adult Outcomes

Undergraduate - Biology and Psychology

Background: Mentoring programs for youth nationwide have shown effectiveness for short-term improvements in outcomes, such as academic achievement and risky behavior. Understanding of the effects that mentoring may have more long-term on adult outcomes has received little rigorous study. Objective: This study investigated the effects of mentoring received through the Big Brothers Big Sisters of America (BBBSA) community-based (CB) program on educational attainment as well as whether any such effects mediated benefits for those mentored in the areas of delinquency/crime and substance use. Method: 250 of the 1,136 participants from a randomized control trial of the BBBSA CB program conducted in the early 1990s were surveyed approximately 20 years later. Measures included self-reported grades in middle school and high school and educational attainment, juvenile and adult arrests, and lifetime use of marijuana and other illegal substances. Participants who reported having had a Big Brother or Big Sister for at least one year in the program were considered to have been mentored. The mentor's reported fulfillment of roles with relevance to academic success (e.g., helping with school work) was also assessed. Multi-variable regression analyses were conducted to address study aims. Results: Receipt of mentoring was a significant predictor of educational attainment. Within the category of educational attainment when 3 academic outcomes were measured, it was observed that educational attainment wasn't a direct mediator between mentoring and other adult outcomes. However, mentoring was not associated with the other adult outcomes. Conclusion: A community-based mentoring program showed evidence of a favorable influence on illegal drug use but not on other measures of adult outcomes. Future research should consider how to improve mentoring programs, such as extending the length of the relationship between mentor and mentee and providing more emotional and moral support towards the youth.

23. Bazi, Emily; Dai, Jingbo and Zhou, Guofei.

Regulatory Role of ENO1 in the Proliferation and Survival of A549

Undergraduate - Pediatrics

Lung cancer is the leading cause of cancer-related deaths in the world with non-small cell lung cancer (NSCLC) making up about 85% of all lung cancer cases. A549 cells are adenocarcinomic human alveolar basal epithelial cells and are widely used for both basic

research and drug discovery in NSCLC. Metabolic reprogramming plays an important role in the pathophysiology of cancer. This phenomenon was called the Warburg effect which exhibit decreased Oxidative phosphorylation (OXPHOS) paired with increased glycolic rates. The molecular and biochemical changes driving this metabolic shift in cancer are incompletely understood but several important regulatory pathways that contribute to it have been identified. Hypoxia-inducible factor (HIF) 1 is a prolific transcriptional regulator and affects the expression of many genes related to carbohydrate metabolism including glucose transporters and glycolytic enzymes. Among the regulatory target of HIF1, Enolase (ENO) 1 is a metalloenzyme that catalyzes the dehydration of 2-phospho-D-glycerate (2-PG) to phosphoenolpyruvate (PEP) in the glycolytic pathway. My study focused on the role of ENO1 in the hypoxia-induced metabolic reprogramming in A549. I found that hypoxia significantly induced the expression level of ENO1 in A549. By transfection of lentivirus containing short hairpin RNAs (shRNAs) against ENO1, I silenced ENO1 in A549 and measured the cell proliferation, cell viability, and cell death level in normoxic conditions. Using BrdU assay, I discovered that silencing of ENO1 has no significant effect on cell proliferation level in normoxic condition but reduced the proliferating cell nuclear antigen (PCNA) level in hypoxic condition. Silencing of ENO1 also elevated the cell death level while reduced the viability of A549. These results indicated that ENO1 contributes to cell proliferation and survival in A549 and can be considered as a therapeutic target of NSCLC.

24. Berhane, Selomie

Health Policies That Improve Birth Equity and Reduce Infant Mortality Among Underserved African-American Women

Undergraduate - Institute for Policy & Civic Engagement

Infant mortality is a major indicator of the health status of a population. Studies show the burden of infant mortality is distributed unevenly across the United States. The highest infant mortality rates are recorded in African American populations with low socioeconomic status. The infant mortality rate among African Americans is 2.4 times higher than that of non-Hispanic White infants, primarily due to preterm birth and birth related complications. The disparity is also correlated with several factors that include socioeconomic status, birth weight, and lack of prenatal care. Scholarly and peer-reviewed articles were studied in addition to documentaries and informational interviews for the purpose of this review of literature. Subsequently, findings of this literature review will provide background information on disparities in infant mortality based on race. Current best practices and policy recommendations on measures that may be taken in the future to mitigate infant mortality in urban African-American women with low socioeconomic status will be explored in this study.

25. Besser, Henry and Carrier, Branden

Brownian Motion on Manifolds

Undergraduate - Mathematics, Statistics, and Computer Science

We consider the problem of simulating Brownian motion on Riemannian manifolds to examine Birkhoff's Ergodic Theorem. The Wiener process mathematically describes Brownian motion as a continuous-time stochastic process, and has connections to many fields of research such as gradients in neural networks for optimization of deep learning algorithms. Albeit the multitude of algorithms available for realizations of the Wiener process in n-dimensional Euclidean spaces that can scale to large n, these methods are not directly suited for simulating a Markov process with continuous sample paths (i.e. Brownian motion as a diffusion process) on more general Riemannian manifolds. Using techniques from differential geometry, we implement a method that projects each Brownian step to a point on the manifold, $M \subset \mathbb{R}^n$. The resulting algorithm is scalable, and we demonstrate a concrete example of this method by projecting Brownian motion in \mathbb{R}^2 to S^2 , a 2-sphere manifold embedded in \mathbb{R}^3 . All points in S^2 have a unique tangent space (of dimensionality 2) where the steps are sampled from a Gaussian distribution. In accordance to Birkhoff's Ergodic Theorem, after a long time (large sample size and small steps), the system evolves to where it has no memory of its initial state. All parts of the manifold are visited without any systematic period. Thus, we are able to show the time-average of the Brownian motion trajectory equals the space-average almost everywhere (i.e. ergodic), and the probability of finding all initial points on the manifold are expected to be the same (i.e. uniformly distributed). Finally, we begin to expand upon the intuitions gained from the observed data--including generalizing our methods to more complicated structures and developing an algorithm that computes the probability density estimate of Brownian motion on Riemannian manifolds. The latter is inspired by modern techniques arising in machine learning.

26. Betancur Giraldo, Tatiana

Response to Brain Injury in the Hypoxia-tolerant Naked-Mole Rat.

Undergraduate - Neurobiology

Hypoxia refers to a deficiency in the amount of oxygen reaching tissues. In turn, limited oxygen supply initiates a cascade of mechanisms that may result in irreversible brain damage by causing apoptosis (cell-death). This cascade of mechanisms is mediated largely by N-methyl-D-aspartate receptors (NMDARs). Depending on their rate of expression, these receptors can drive neurons toward neuroprotective or toxic pathways during hypoxic events. Interestingly, previous research has shown that, unlike other mammals, naked mole-rats thrive in hypoxic environments without suffering substantial detrimental effects. It appears that evolution has equipped naked mole-rats with neuroprotective features within their NMDARs, which have allowed these rodents to preserve their brain function despite living underground where little oxygen is available.

However, it is not known whether similar neuroprotective mechanisms exist during excitotoxicity. Excitotoxicity is a pathological process during which high quantities of the excitatory neurotransmitter glutamate cause over excitation of the NMDAR; this over excitation results in cellular damage and eventual cell death. The overall goal of this project was to apply excitotoxic stimulation to the brain to test an *in vivo* naked mole rat stroke model. This research project uses chronic hypoxic-tolerant animals (naked mole rats) as a model to illuminate the mechanisms of the neuroprotective pathway of NMDARs during excitotoxicity. Specifically, after directly injecting NMDA (A water-soluble synthetic substance that mimics the action of the excitatory neurotransmitter glutamate) into the hippocampus of both mice (strain C-57) and naked mole-rats (*Heterocephalus glaber*) the amount of apoptotic tissue was quantified using standard imaging techniques. The data resulting from this project suggested neuroprotection in naked mole rats under excitotoxicity processes (P value <0.0001). Additionally, further studies in this area that could subsequently be used to better characterize the key modulators of NMDARs: Protein kinases and the C-terminal domains phosphorylation sites of NMDAR sub-units. This study has the potential to greatly contribute to ongoing research on the NMDAR, as well as help devise treatments that can lessens or reverse brain damage due to hypoxic events, such as, ischemic stroke, Huntington's and Alzheimer's. Key words: Naked mole rat, N-methyl-D-aspartate receptor, C-terminal domain, protein kinase.

27. Bhupanipad Sunkesula, Finney

The Role of Social Support in Childhood as a Buffer of the Long-Term Effects of Childhood Stressors

Undergraduate - Psychology

The stress-buffering hypothesis suggests that social support experienced by youth theoretically should help them to cope successfully with stressors, such as parental divorce, death of a parent, and abuse. Findings in this area are inconclusive, however, especially with respect to the contributions of support received from different sources (i.e., peers, parents, other supportive adults) and buffering of long-term outcomes during adulthood. This study used secondary analysis of data from a larger study to investigate whether the role of support given in childhood through mentors, parents, and peers was effective in buffering effects of various stressors experienced during childhood on outcomes in adulthood. 250 of 1,136 participants in a randomized control trial of the Big Brothers Big Sisters community-based mentoring program conducted in the early 1990s were surveyed approximately 20 years later. Childhood stress was assessed as the number of possible stressors that each participant had experienced as of the baseline assessment of the original study. Adult survey measures included current levels of depressive symptoms, sociability, grit, and perceived stress. Multi-variable regression analyses were conducted to address study aims. Results generally indicated a lack of significant association between childhood stressors and adult outcomes. With respect to social support, having a BBBS mentor showed evidence of being associated with higher levels of sociability and grit and lower levels of perceived stress. No other associations were evident between

social support and adult outcomes either directly or in interaction with number of childhood stressors. Through this current study, the long-term effects of childhood stressors were examined. Certain stressors had more of an impact on adult outcomes than others. In examining social support, participants whom were mentored had significant effects on several adult psychological outcomes. Future research should include other psychological measures including anxiety, anger, and empathy.

28. Bicknell, Scott; Nageeb Hasan; Andrew Bertagna and David A. Reed.

Ng2 Internalization Is Elevated In Articular Chondrocytes During Late Stage Degenerative Joint Disease In The Tmj
Undergraduate - Oral Biology

Hypothesis: The induction of degenerative joint disease (DJD) in the TMJ will be associated with changes in NG2-type VI collagen colocalization and elevated internalized NG2. Objective: Cell-matrix interactions are critical regulators of TMJ homeostasis in both health and disease. In the pericellular space of articular chondrocytes, the primary matrix component is type VI collagen. These cells interact with this matrix through a transmembrane proteoglycan, Nerve/glial antigen 2 (NG2). The ectodomain of NG2 has a cleavage site that is hypothesized to be an activator intracellular domain (ICD) internalization. Internalization activates a PDZ binding motif on the ICD, potentially affecting transcriptional activity. The study seeks to evaluate how NG2-type VI collagen interactions change and if internalized NG2 is elevated during the progression of TMJ DJD. Methods: DJD was induced in male c57BL/6 mice using unilateral partial discectomy. NG2 and type VI collagen were immunofluorescently labeled and imaged using confocal microscopy. Cytosolic levels of NG2 was quantified using the analyze particles plugin in ImageJ, with a thresholding value of 30 and a minimum particle size of 5 (pixel²). Membrane colocalization of NG2 and type VI collagen was quantified using the WCIF_ImageJ plugin (Toronto Western Research Institute, Canada) and with Duolink Proximity Ligation Assay (Sigma Aldrich). Particle number and colocalization coefficients were statistically compared using t-test two sample assuming unequal variances. Results: In non-surgical controls, NG2-collagen VI colocalization occurred in articular, prechondroblastic and chondroblastic cells. In hypertrophic cells, NG2 was restricted to the cytosol with no pericellular colocalization (n = 3). In mice with DJD, articular cells were associated with decreased colocalization at 4 weeks (0.39-0.24, p < 0.05, df=33), 8 weeks (0.39-0.28, p < 0.05, df=29), and 12 weeks (0.39-0.28, p < 0.05, df=13). Internalized NG2 did not increase at 4 weeks post-operative, but did significantly increase in articular and hypertrophic cells at 8 weeks post-operatively (3-41.7, p < 0.05; df=4). NG2 internalization was significantly lower at 12 weeks post-operatively in all cells (3-0.3, p < 0.05; df=4). Conclusions: NG2-type VI collagen colocalization decreases following the induction of TMJ DJD, and NG2 internalization increases at 8 weeks post-operatively. These data support the hypothesis that protease mediated cleavage of the NG2 ectodomain activates NG2 internalization, potentially affecting transcription activity through a PDZ dependent pathway.

29. Bondoc, Jasper Marc; Wolf, Nina M and Movahedzadeh, Farahnaz

Rv0100: An essential acyl carrier protein of *Mycobacterium tuberculosis*

Undergraduate - Institute for Tuberculosis Research

Finding a novel drug for treatment of *Mycobacterium tuberculosis* (Mt), the etiological agent of tuberculosis (TB) infection is a great concern due to the increasingly resistant strains. In 2014, the World Health Organization reported that 1.5 million deaths occur annually as a result of TB. Rv0100 has been shown to be an essential gene and a current target at the UIC Institute for Tuberculosis Research. Rv0100 is predicted to be an acyl carrier protein (ACP), important in fatty acid biosynthesis. It has previously been shown through microarray experiments to be significantly upregulated in a latency model of Mt, unlike other identified ACPS in TB. Expression and purification protocols using a non-pathogenic mycobacteria, *M. smegmatis*, has successfully yielded pure protein. The effort to perform high throughput screening for crystallography of this essential gene is in progress. This would help us to capture the protein as an apo-structure and in complex with its binding partner in the future to resolve the structure of this essential gene of *M. tuberculosis*. Targeting this gene for structure-based drug design could result in a lead candidate in the drug discovery effort against TB.

30. Bono, Emma; Wirtshafter, David and Arthurs, Joseph

A Methodological Study of the Viral Vector AAV-hSyn-EGFP as a Neuronal Tracer

Undergraduate - Neuroscience

Viral vectors are a powerful tool for delivering exogenous genetic material into mammalian cells; Some of its' uses include chemogenetics, optogenetics, and neuronal tracing. Before moving onto full-scale experiments with viral vectors, it is crucial to determine if the virus can successfully transfect the cell bodies of interest, and determine whether suitable levels of expression are obtained with the viral titer in question. This study investigated the effectiveness of transfecting cells in the medial amygdala in male Sprague-Dawley rats with an adeno-associated virus, AAV-hSyn-EGFP. The virus was infused into targets of interest using stereotaxic techniques and animals recovered for three weeks prior to perfusion under deep anesthesia and extraction of the brains. The brains were sliced coronally, stained with a DAPI solution, and examined under a light microscope. This study additionally aimed at determining if viral vectors can be used for neuronal tracing. Neuronal tracing is important to determine projections to and from different areas of the brain to identify functions and connections between brain structures. This study will examine if the terminal fields of the medial amygdala can be visualized with EGFP (Enhanced Green Fluorescent Protein) as a tracer. Since native EGFP fluorescence was insufficiently intense for this purpose, this study additionally implemented immunohistochemical techniques in attempt to increase the visualization of the incorporation of EGFP after brain slices have already been mounted. This study

demonstrates that it is possible to transfect the cell bodies within the medial amygdala with this viral vector, however this method does not appear suitable for long-range tracing of the axons and visualization within terminal fields.

31. Bonynge, Brett

How do National Guard members perceive higher education, educational benefits, and their financial obligations?

Undergraduate - Biological Sciences

Members of the Illinois Air National Guard receive multiple options for assistance in paying for education. They can receive the Illinois National Guard Grant, which waives tuition and fees for all eligible members at any public school within the state of Illinois or tuition assistance for private schools. To assist with any other expenses, members may also receive the Montgomery GI Bill or the Post 9/11 GI Bill, which provide monthly stipends while the member is in school. Despite these benefits, many members still do not utilize these benefits to pursue higher education. This study was conducted at the University of Illinois at Chicago to delve into the perceptions military members have about higher education and any financial obligations they may face while pursuing a degree. The study consisted of 5 individual interviews of members of the Peoria Air National Guard for qualitative analysis of any trends among the answers given. The American Council of Education (ACE) mentions seven risk factors that lead to a loss in higher education retention. Among these risk factors include late enrollment, dependents, financial independence, and a lack of fitting in. However, of the studies conducted on higher education retention among military members, little studies have been done on the financial aspects many members face. Of the five people interviewed for this study, two have stopped pursuing education due to financial obligations and full time employment. The remaining 3 members either had a kicker, and thus received more money each month, or tended to have less obligations (no rent, no car payment, no food expenses, etc.).

32. Brahmbhatt, Janki

The Milkomedra Merger

Undergraduate - Physics

The Andromeda and Milky Way galaxies are going to collide in about 4 billion years, and the two originally spiral shaped galaxies are going to distort into a single elliptical galaxy. The purpose of this project is to create a 3-D model of the Milkomedra merger using and modifying a galaxy merger code available on the Astrophysics Source Code Library. This code uses a restricted 3-body approach to model the morphology of actual interacting galaxies. The data will be displayed at UIC's Electronic Visualization Laboratory at CAVE2 where viewers will be able to see a galaxy merger in 3D from different perspectives.

33. Bravo, Anisa and Nelson, Richard

Aspirin as Adjuvant Therapy for Colorectal Cancer: A Systematic Review

Undergraduate - Epidemiology and Biostatistics

Background: Aspirin (acetylsalicylic acid) has been shown by many studies to reduce mortality from colorectal cancer (CRC) when taken following diagnosis. Exact mechanisms of aspirin's effect on tumor suppression are uncertain but are likely related to COX-2 inhibition. This systematic review was performed to review all available studies investigating the association between daily aspirin consumption and reduced mortality due to CRC. Methods: An electronic literature search was performed of published literature on PubMed, Embase, and Cochrane databases, as well as ClinicalTrials.gov. Relevant studies were identified by two investigators using predetermined eligibility criteria. Data were extracted from 11 eligible studies and meta-analysis was performed using HEpiMA to determine overall relative risk and data heterogeneity in aggregate. Results: Meta-analysis of eleven studies demonstrated that aspirin use in CRC patients post-diagnosis was associated with reduction in risk of mortality, with a pooled relative risk of 0.77 (Confidence Interval 95%, 0.69-0.85). A random effects model was used. Data presents little heterogeneity ($P < .05$), with low τ^2 , R_i and CVB values that demonstrate low between-study difference. Conclusions: Taken together, current scientific literature demonstrates that aspirin used as adjuvant therapy for CRC is protective against mortality. While limitations of this analysis include variation in follow up times, dosage, and ratios used, low heterogeneity suggests consonance in current literature. More randomized trials would be needed to confirm these results.

34. Buti, Aditi; Malone, Margaret and Whelan, Christopher

The Relationship Between Coral Reef Quality and Fish Species Diversity

Undergraduate - Biological Sciences

Coral reef ecosystems are currently facing critical declines worldwide. The quality of a reef is often determined by the amount of coral cover. A high quality reef can be defined by a high amount of coral coverage, whereas a degraded reef will have a low amount of coral cover. Corals contribute to habitat structure and the energy in reef systems. They facilitate the existence of many types of fish species. Therefore, the quality of the reef affects both species composition and the abundance of fish inhabitants of different reefs. The patch reefs of Kane'ohe Bay, Oahu, Hawai'i, range from near pristine (100% coral cover) to degraded (near 50% algal cover). I hypothesize that there will be a difference in fish species richness and abundance between degraded and high quality reefs. Species richness, or the number of fish species, and the abundance of individuals within species will be greater on higher quality reefs compared to lower quality reefs. Additionally, species diversity, which takes diversity and abundance into account, will be greater on the

higher quality reefs compared to the lower quality reefs. I analyzed underwater GoPro videos collected in Summer 2016. GoPro cameras were deployed at experimental food patches as part of a larger study on coral reef fish behavior. I quantified the number of species, and the number of individual fish of each species in a designated time sequence. T-tests were used to compare mean species richness and the mean fish abundance on both high quality and low quality reefs. Species diversity in the two types of reefs will be compared via the Simpson's Diversity Index. The results from this research will be used as part of a larger study addressing behavioral responses to habitat degradation. My video findings will be validated with fish community data collected across each reef.

35. Cabel, Gervacio

Digital Format vs. Paper Format in Chemistry Learning - A Validation Study

Undergraduate – Chemistry

As students become more electronically involved with the progressing technological era of education, it is important to observe whether utilizing electronic tools such as computers and eBooks has an effect on learning. This study has the goal of determining whether there is a significant effect of paper or digital tests when dealing with spatial visualization and mental rotation. To accomplish this, human participants will be recruited and partake in a series of timed paper and digital tests. The two tests being analyzed are the Guay Test and the Mental Rotation Test. Although spatial ability tests such as the Mental Rotation test and the Guay test have been well established to measure spatial ability, differences between digital and paper formats of these two tests have not been validated. Thus, the aim of this project is mainly a validation study, in which the proposed hypothesis is that there is no significant difference in the averages of scores between paper tests and digital tests. To statistically support this hypothesis, projected results would include p-values higher than 0.05 when analyzing data between the paper format and the digital format of each specific test. The participants took two tests that were identical in their paper format and digital format. There was another mock test in the digital format added to prevent test-retest effects. The orders of the tests taken were randomized. The results of this study can benefit chemistry education since if the proposed hypothesis is proven wrong and there is a significantly better average of scores within paper or digital formats, then the way chemical diagrams are shown or taught can be modified accordingly to better help learning in chemistry.

36. Cantoral, Jackelyn; Reyes, Karina; Yanez, Betina and Buitrago, Diana

Understanding Adherence to Oral Anti-Cancer Medications among Latina Breast Cancer Survivors

Undergraduate - Kinesiology and Nutrition

Cancer is the leading cause of death among Latinas/Hispanics living in the U.S. and among Latinas, breast cancer is the most commonly diagnosed type of cancer. The aim of this study was to identify factors associated with non-adherence to endocrine therapy (ET) which is an oral, anti-cancer medication that prevents recurrence of cancer among women who have completed active treatment for breast cancer. We conducted a mixed-methods, observational study to investigate factors related to non-adherence to ET. We recruited 91 English and Spanish-speaking Latina breast cancer survivors from the Chicago Metropolitan area (>90% accrual rate) who were diagnosed with hormone-receptor positive non-metastatic breast cancer. Phase 1 (n=31) involved documenting qualitative themes of non-adherence, whereas Phase 2 (n=60) focused on identifying factors associated with non-adherence among Latinas. When stratified by adherent versus non-adherent, non-adherent participants were more likely to discuss lack of knowledge or inaccurate knowledge regarding how to take ET (83% vs. 47%), lack of knowledge or inaccurate knowledge regarding the purpose of ET (75% vs. 32%), and having low self-efficacy (83% vs. 37%). Adherent participants were more likely to discuss managing side effects of ET (95% vs. 67%), using a reminder system (e.g., setting a daily alarm) to take medications (68% vs. 50%), and perceived benefits of taking ET (26% vs. 17%). In the second phase of the study we collected quantitative data on factors related to non-adherence. Although this study was initially powered to find large effect sizes, t-tests revealed key differences between adherent and non-adherent women on measures of self-efficacy ($p<.05$; $d = .63$), experiencing ET side effects ($p<.10$; $d = .50$), and perceived need for ET ($p<.05$; $d = .89$) such that adherent women reported greater self-efficacy and greater perceived need for ET but fewer side effects of ET compared to non-adherent women.

37. Casaclang, Arielle; Leme-Kraus, Ariene and Bedran-Russo, Anakarina

Long-Term Bioadhesive Properties Of Proanthocyanidins Enriched Fractions To Dentin

Undergraduate - Kinesiology and Nutrition

Grape seed extract (GSE) contains oligomeric proanthocyanidins (OPACs) that have been studied due to their ability to biomodify dentin through interactions with collagen cross-linking in the dentin matrix. The dentin matrix is important when considering the interface made with composite resin during the restoration procedure of a tooth. This study compared how different treatments with GSE affected the bond strength of dentin-resin interface over time. Methods: Extracted human molars (IRB #2011-0312) were selected (n=7 per group), enamel removed and flat coronal dentin was exposed. OPACs were prepared from a grape seed extract (GSE) after solvent separation followed by chromatography partitioning, resulting in 3 experimental fractions: upper-phase GSE (GSE-UP), galloylated dimers, and non-galloylated dimers. Fractions were prepared as treatment primers at 15% concentration in 20mn HEPES. An experimental methacrylate resin blend was used to bond resin composite to the dentin. Dentin surfaces were etched with 35% phosphoric acid, rinsed and treated for 1 minute with one of the experimental primers. Primer was rinsed and dental adhesive immediately applied, light cured and a

resin composite was incrementally placed. After being stored in distilled water, the teeth were cut into beams (0.8×0.8 mm) and tested on a microtensile tester after 24 hours and after being stored in simulated body fluid for up to 24 months. Data was calculated and expressed in MPa. Results: The bond strength values did not change much for galloylated dimers (35.11 ± 10.77 ; 33.72 ± 6.17 ; 31.42 ± 7.41 MPa) after 24 hours, 12 months, and 24 months respectively. Comparatively, bond strength GSE-UP decreased over time (53.42 ± 8.41 ; 48.00 ± 9.26 ; 43.37 ± 7.72 MPa) while non-galloylated dimers experienced a steady state for 12 months (42.13 ± 19.10 ; 41.43 ± 12.56 MPa) before decreasing in bond strength after 24 months (36.69 ± 9.87 MPa). Conclusion: Treatment with galloylated dimers exhibited the most stability over the longest time compared to GSE-UP and non-galloylated dimers.

38. Ceppi, Enrique; Holmes, Olivia and Bonam, Courtney

Socioeconomic threat and the perception of multiple ambiguous others

Undergraduate – Psychology

Race is one of the most important social factors in the United States. With a changing racial landscape (driven in part by a growing Multiracial population not easily divided into existing racial categories) and increasing socioeconomic unrest regarding racial groups and populations, it is important to understand the dynamics of perception of racial ambiguity. This study evaluated how White Americans establish racial ingroup and outgroup boundaries, especially in the presence of a socioeconomic threat to their presence at the apex of the established American racial hierarchy. White participants were presented with vignettes documenting either a rise in Black socioeconomic affluence (threat condition) or no change in Black affluence (non-threat condition). Participants were then shown a matrix of Black/White Biracial faces and identified the percentage of faces they perceived to be White (ingroup). In addition, participants' Social Dominance Orientation (SDO), a measure of their support for intergroup inequality, was evaluated. Data analysis found that participants in the threat condition perceived more faces as White than participants in the non-threat condition, but only for individuals high in SDO. The implications of these results and recommendations for future research are discussed.

39. Chang, James

The Effects Of Climate Change on Carbon Storage in Soils in Alaskan Tundra

Undergraduate - Biological Sciences

The term soil organic carbon (SOC) refers to the carbon component of organic matter contained within soil. In the Northern hemisphere, soils contain nearly twice the amount of carbon than that of the atmosphere. Through the processes of decomposition and cellular respiration, which produce CO₂, microorganisms within these soils play an essential role in regulating how much carbon is released into the atmosphere. With

climate change becoming a very real threat in Arctic ecosystems, the questions we aim to answer in this paper are 1) how are these microbes and their ability to decompose organic matter being affected by climate change, and 2) what effect does climate change have on carbon storage in this ecosystem? We took soil samples from a long-term experimental snow depth manipulation site near Toolik Field Station in Northern Alaska. Utilizing a snow fence designed to mimic the effects of increased winter precipitation due to climate change, soil cores were collected from three different treatment zones with varying degrees of snow accumulation. This snow depth manipulation also caused the soils to have varying temperatures due to the different amounts of snow accumulation. The deeper the snow on top of the soil, the more insulated the soil will be from the cold external environment. Each soil core was then cut into 1 cm segments and ground into a very fine powder. This powder was then examined using an elemental analyzer to determine how much carbon and nitrogen is contained within the soils.

40. Chau, Vivian; Foucher, Kharma C and Longworth, Jessica A

Relationship between Walking Speeds, Modality, and Oxygen Consumption

Undergraduate - Kinesiology and Nutrition

Introduction: Treadmill walking facilitates optimal metabolic data, while overground walking facilitates “natural” mechanical data. An effective method for collecting overground walking mechanics representative of the corresponding metabolic data would improve the validity of study results that are based on the interaction between the mechanical and metabolic systems. This pilot study contributes to the long-term goal of developing an optimal protocol to obtain both mechanical and metabolic gait data that are collected under the most appropriate testing conditions. The aim of this study was to determine differences in walking speeds between three different laboratory testing conditions. We hypothesized that mean walking speed would differ between each condition. Methods: Data were collected for ten adults (3 females, 23 ± 4 yr, 1.7 ± 0.1 m, 74 ± 7 kg, 25.7 ± 2.7 kg/m²). Walking speed and oxygen consumption (VO_2) were measured during three conditions: (1) overground walking at a self-selected speed (OGSSS), (2) treadmill walking at a self-selected speed (TMSSS), and (3) overground walking at a speed that elicited an equivalent VO_2 as that which was achieved on the treadmill (VO_2M). A one-way repeated measures ANOVA will be conducted to compare walking speeds between testing conditions (OGSSS, TMSSS, and VO_2M). Results: We predict that VO_2M walking speed will be less than treadmill walking speed and greater than overground walking speed. Conclusion: If walking speeds are different among testing conditions, the next step will be to determine if the corresponding kinematic and kinetic measures (e.g., joint angles and moments) also differ among testing conditions. This would further the need for a prescribed walking speed performed on a particular modality and dependent on the question asked.

41. Chaudhry, Mary; Vallalar, Bharathi and Meyer-Dombard, D'Arcy

Taxonomic Diversity in Deep Biosphere Ecosystems

Undergraduate - Environmental and Earth Sciences

It has only been realized very recently that the deep subsurface biosphere can support life. In fact, it has been discovered that the subsurface biosphere supports as much biomass, and possibly more, as the surface biosphere. The subsurface biosphere is a largely unexplored region, and because of this, the impact it has on global biogeochemical cycling is unknown. This ongoing research project explores the taxonomic diversity in subsurface ecosystems in “serpentinizing” fluids from the Philippines. These fluids come to the surface as springs, and support both Bacterial and Archaeal organisms both in the fluids, and in sediments collected in surface pools. The project is cataloguing the taxonomic diversity at these specific sites, through the use of DNA extraction and high-throughput 16S rRNA sequencing, as part of a larger project to determine if there are ‘core’ taxa that exist in similar sites worldwide. The next goal will be to determine if these ‘core’ taxa also represent a core of metabolic diversity, and whether these consist of generalist or specialist organisms. The data show the composition of the bacterial community, the taxonomic diversity of individual springs, and the ‘Beta’ diversity between springs. In addition, results will be used to compare the impact of heavy precipitation during the wet season on the taxonomic diversity.

42. Chen, Linshan

Capsim: A Business Simulation of Learning to Outperform Your Competitors with Equal Starting Points

Undergraduate – Accounting

Capsim is a business simulation that has six companies to compete in the same sensor industry with equal starting points. There are five segments in the industry that represents the potential customers with different weighted preferences, such as ideal position, price, age, and reliability. Each year, the number of customers in different segments can either be growing or decreasing, which could be resulted from a recession or recovery of the system, and customers are demanding higher performance and lower size sensors at different rates. The competitions are evaluated based on four categories: financial, internal business process, customer, and learning and growth. In this discussion, I will explain how my company, Chester, achieves top performance and how the strategy evolves from overall cost leadership strategy to the combination of cost leadership, differentiation, and life cycle strategy; I will also provide SWOT analysis, describe how to conduct a spreadsheet that keeps tract of other companies’ historical decisions and industry-wide trends, and explain how Chester executes the strategy by integrating six departments: R&D, Marketing, Production, Finance, Human Resources, and TQM (total quality management). As the CEO, my role is to oversee the six departments’ operations as a whole and to ensure that the decisions follow the strategy; the trustiness among the group

members and iterative processes allow the company to react to the market quickly and profitably.

43. Chen, Xin; Indacochea, J Ernesto and Ebert, William.

A U-Bearing Composite Waste Form for Electrochemical Processing Wastes

Graduate/Professional - Civil and Materials Engineering

Metallic/ceramic composite waste forms are being developed for combined metallic and oxide waste streams generated during electrochemical refining of used nuclear fuel. Composites were made for corrosion testing by reacting HT9 steel to represent fuel cladding, Zr and Mo to simulate metallic fuel waste, and a mixture of ZrO₂, Nd₂O₃, and UO₂ to represent oxide wastes. The Nd₂O₃ and some of the uranium reacted with Zr to form zirconates and the remaining uranium was reduced and incorporated in Fe-Zr-U intermetallics. Two Fe-Cr-Mo intermetallics also formed, which are expected to host Tc. The results of microstructure characterizations of the intermetallic and ceramic phases that were generated and tests conducted to evaluate their corrosion behaviors will be presented. Test results suggest composite waste forms will provide flexibility for immobilizing complex waste streams by accommodating both metallic and oxidized waste streams in durable host phases while lowering waste form production and disposal costs.

44. Cheng, Tiffany

Friend or Foe? Media Framing of a Political Protest: The Sunflower Movement

Undergraduate – Communications

The Sunflower Movement was a student led protest in Taiwan that protested the cross-strait service trade agreement (CSSTA), a trade agreement that aimed to expand trade in services between Taiwan and the People's Republic of China. This study will examine the portrayal of the Sunflower Movement in the two major English-language newspapers in Taiwan, The China Post and Taiwan News, by performing a framing analysis on articles pertaining to the protest. The concept of framing refers to how the media presents information to the public by emphasizing certain events, directing attention away from other events, and utilizing certain keywords and phrases. Since an audience may lack knowledge about current events and depends on the media to stay informed, framing can influence individuals to think about phenomena, like the Sunflower Movement, in a particular way. To analyze the way in which The China Post and Taiwan News framed the Sunflower Movement and shaped public opinion, 64 articles published by Taiwan News and 47 articles published by The China Post were coded utilizing a similar coding structure deployed for framing analyses of other political movements. The collected articles were all published between March 4, 2014 and April 24, 2014 – an interval limited to two weeks prior to the protest and two weeks after the end of the protest. Ultimately, my findings will provide a better understanding of Taiwan's political climate, the division

among Taiwanese society, and its people's stances towards increasing economic ties with China.

45. Chiu, Ryan; Henderson, Shaina and Chirinko, Robert

Expectations of a Federal Bailout within the Puerto Rican General Obligation Bond Market During the Puerto Rican Debt Crisis

Undergraduate - Political Science

In 2016, the government of Puerto Rico defaulted on \$2 billion worth of liability to its creditors, leading the federal government to intervene and enable the commonwealth to restructure its then \$72 billion of accumulated outstanding debt. Utilizing the risk premium between uninsured and insured issues of Puerto Rican general obligation bonds as a proxy for investor sentiment, it is apparent that there is insufficient evidence to suggest that the bond market reflected shifting concerns about the worsening nature of the Puerto Rican economy from 2000 to 2014. Rather, it is likely that the prevailing market sentiment during this time frame was such that investors were expecting an eventual bailout by the United States government.

46. Chouhdry, Hira; Fogel, Jessica; Pezley, Lacey; Dowty, Shannon and Maki, Pauline

The Effects of Pregnancy Intention on Perinatal Depression

Undergraduate – Neuroscience

Unplanned pregnancies are associated with both prematurity and cognitive and behavioral deficits in the baby, as well as mental health issues among the mother. Despite research showing that 10-20% of new mothers develop postpartum depression, limited research has been conducted on depression in context of pregnancy intention. Most studies are based on predominantly Caucasian populations and thus have restricted generalizability. Furthermore, previous results have been mixed. Some studies have found a statistically significant association between pregnancy intention and depression, while others have not. The purpose of the present study was to investigate the relationship between pregnancy intention and perinatal depression in an ethnically diverse population. Participants included 92 expecting mothers receiving perinatal care at the University of Illinois Hospital and Health Sciences System. Depression was measured using the Patient Health Questionnaire-9 (PHQ-9) score extracted from electronic medical records. Pregnancy intention was assessed from a self-report questionnaire on Women's Health and Mood Screening Form. A univariate repeated measures ANOVA was conducted to determine group differences. Results showed significant group differences based on self-reported pregnancy intention, $F(4, 87) = 3.45$, $p = 0.012$. Post-hoc comparisons indicated a significant difference in PHQ-9 scores between women who "did not want to be pregnant" ($M=10.11$, $SD= 5.93$) and those who either reported they "wanted to be pregnancy sooner" ($M=4.10$, $SD= 2.15$), "wanted to be pregnant later" ($M= 5.03$, $SD=$

4.65) and “wanted to be pregnant then” ($M=5.06$, $SD=4.88$). These findings suggest that identifying women who did not want to be pregnant needs to be a priority when screening for perinatal depression. Assessing both pregnancy intention and depression early in pregnancy will allow women to receive treatment soon and help ensure better mental health outcomes for both themselves and their baby.

47. Condren, Alanna and Sanchez, Laura

Pseudomonas Aeruginosa Shifts its Specialized Metabolism in Response to Biofilm Inhibitors

Graduate/Professional - Medicinal Chemistry & Pharmacognosy

In order to communicate, bacteria release a series of specified molecules to produce a cumulative response and this process is referred to as quorum sensing. Understanding how bacteria communicate and deciphering the language they use can give insight into how bacteria regulate host-pathogen interactions. We hypothesize that the order, concentration, and time that bacteria begin to release small molecules could be factors used to optimize communication which leads to increased fitness and virulence.

Pseudomonas aeruginosa proceeds through a biofilm life cycle during colonization in a host, and biofilms are a contributory factor to the persistence and antibiotic resistance of up to 80% of microbial infections in the human body. Therefore, identifying and monitoring the small molecules produced when bacteria initiate and degrade a biofilm state can provide a better understanding of the language used by pathogenic bacteria to maintain infection *in vivo*. In order to simplify the complexity of deciphering the language of small molecules we begin with a species whose metabolites have been well characterized such as *P. aeruginosa*. Using *P. aeruginosa* as a model system, we tested our hypothesis using matrix assisted laser desorption ionization time of flight (MALDI-TOF) imaging mass spectrometry (IMS) to identify the small molecules involved in biofilm formation and degradation in *P. aeruginosa*. We found that four families of known metabolites were altered in the presence of a biofilm inhibitors and 21 previously undescribed metabolites were either upregulated or downregulated due to exposure of our biofilm inhibitors.

48. Contreras, Mario

Visualization and Tracking of G β in Mating Yeast

Undergraduate - Biological Sciences

Chemotropism (chemical gradient-induced growth) and chemotaxis (chemical gradient-induced movement) are fundamental phenomena found in most organisms. Examples of these processes are found in axon growth cone guidance, cancer metastasis, and angiogenesis. Both processes involve signal transduction mechanisms that allow cells to interpret external chemical gradients and grow or move in the appropriate direction. The

intracellular signaling components involved in these processes are well known and highly conserved across species, but how they interact to establish directional growth and movement is not well understood. The budding yeast, *Saccharomyces cerevisiae*, is a useful model organism to study chemotropism. Yeast cells need to determine where their mating partner is located. They do this by sensing the concentration gradient of mating pheromone via a G protein coupled receptor and its cognate G protein, but exactly how this is accomplished is unknown. David Stone's lab at University of Illinois - Chicago is trying to unravel this mystery. Our lab has proposed a model that explains how mating yeast cells establish a chemotropic growth site in response to a shallow gradient of mating pheromone. This presentation describes the tagging of the G β subunit of the mating-specific G protein with GFP to create an intracellular reporter. Our current model suggests that both the G protein and its receptor track along the cell membrane towards the highest concentration of pheromone, thus orienting the cell's growth towards its nearest potential mating partner. We will test this hypothesis by visualizing the movement of the GFP-G β reporter in mating cells.

49. Cook, Alyssa; Zarate, Estefania and Cologna, Stephanie M.

Mass Spectrometry-based Discovery Lipidomics in Neurodegenerative Diseases

Undergraduate - Chemistry

Mass spectrometry (MS) is a powerful technique for discovery and targeted analysis of biomolecules including proteins, lipids and metabolites. In this study, we focused on developing and optimizing lipid extraction methods to perform downstream mass spectrometry analysis of cell and tissue lysates. Initial methods were developed using mammalian cells in which lipid extraction techniques were verified by matrix-assisted laser desorption/ionization (MALDI) MS. Next we optimized the extraction of lipids from brain tissues in a mouse model of Niemann-Pick Disease, type C1 (NPC1). NPC1 is a genetic, fatal, neurodegenerative disorder that results in accumulation of lipids in lysosomes. Our current work is focused on integrating our methods for lipid isolation with online discovery-based lipidomics using chromatography and electrospray ionization (ESI) mass spectrometry. The overarching goal of this work is to provide a platform to identify lipid biomarkers in NPC1.

50. Dela Cruz, Caila Samantha

The Works of Liliane Atlan: Re-Thinking the Way We Think About and Teach the Holocaust

Undergraduate - French & Francophone Studies

This research takes on the questions of why we must change the way we think about and teach the Holocaust, and how to go about doing so. In order to answer these questions, we have turned to the works of Liliane Atlan, focusing in particular on her plays *Un Opéra*

pour Terezin and Monsieur Fugue, ou le mal de terre. Being Jewish, Atlan and her family went into hiding during WWII, and after the war her parents adopted a concentration camp survivor. These experiences had a strong effect on Atlan, so she began to focus her work on Holocaust experience. Since then, Atlan has developed a unique perspective on it that manifests itself in tremendously innovative ways through her writing. Though she is not very famous, we have found that her work holds techniques that can be applied pedagogically and enhance Holocaust education. Some examples of these techniques from Un Opéra pour Terezin are the use of contrast between distance and intimacy which ultimately leads into an intense emphasis on unity, connecting communities across the world and across time, as well as creating a connection between imagination or mental images and physical senses. At the same time, however, we see a tension that forms because Atlan maintains the crucial element of the diversity of Holocaust experience as well. Furthermore, Atlan explores the importance of questioning, use of art, and the necessity of flexibility.

51. Deshpande, Rucha; Singleton, Chelsea; Fouche, Sydney; Odoms-Young, Angela; Chatman, Corey and Spreen, Connie

Fruit and Vegetable Consumption among Low-income Farmers Market Incentive Program Users in Illinois

Undergraduate - Human Nutrition

Background: In recent years, an increasing number of farmers markets have opened in or near low-income communities across the US. Farmers markets provide an opportunity for low-income families to have access to fresh fruits and vegetables (FVs). In Illinois, the LINK Up Illinois farmers market incentive program provides a monetary incentive to Supplemental Nutrition Assistance Program (SNAP) participants so they can increase the amount of fresh FVs they purchase at a farmers market. This research project's aim was to evaluate F&V consumption and LINK Up Illinois program satisfaction among SNAP participants in Illinois.

Methods: In 2016, 140 SNAP participants completed a survey at six different farmers markets in Illinois. The survey was issued at farmers markets in Chicago, Aurora, Northbrook, Springfield, Woodstock, and Urbana, IL. Data collected from the survey included frequency of fresh FV consumption, demographics, attitudes towards FV consumption, and satisfaction with the LINK Up Illinois program.

Descriptive statistics (i.e. means and frequencies) were calculated for all variables of interest. **Results:** About 77% of our survey participants did not meet the required consumption for vegetables in the month prior to completing the survey. Furthermore, about 78% of our survey participants did not consume the required amount of fruits in the prior month. Over 95% of survey participants agreed that the LINK Up Illinois program is important and has positively affected their FV intake. Approximately 30% stated that the LINK Up Illinois match limit was a key reason why they do not utilize the incentive program more often. **Conclusion:** FV consumption among SNAP participants who utilize the LINK Up Illinois incentive program was low. There needs to be more research on why some low-income individuals and families in Illinois continue to not consume enough fruits and vegetables.

52. Deshpande, Sarita; Alam, Minhaj and Yao, Xincheng

Quantitative Analysis of Sickle Cell Retinopathy in Optical Coherence Tomography Angiography

Undergraduate - Bioengineering

Optical coherence tomography angiography (OCTA) is a non-invasive imaging modality characterized by high resolution for three-dimensional visualization of retinal vasculature. OCTA overcomes some limitations associated with traditional angiography techniques, such as fluorescein angiography and indocyanine green angiography. This study aims to evaluate the progression of sickle cell retinopathy (SCR), a genetic condition that is characterized by blood flow occlusion in peripheral retinal vasculature, with OCTA. Image segmentation and processing of OCTA images for SCR patients and control patients was conducted using Matlab. Six parameters, including blood vessel tortuosity, vessel diameter, vessel perimeter index, area of foveal avascular zone, contour irregularity, and parafoveal avascular density, were quantitatively determined. These six feature vectors allowed for automated OCTA classification of SCR. In comparison to retinal thickness analysis, OCTA classification provides improved sensitivity for SCR detection.

53. Deutsch, Elizabeth

Effectiveness of Various Psychological Interventions When Working with Adolescents

Undergraduate – Psychology

Behavioral Disorders are the most frequent clinical referrals in adolescents. It is often hard for parents and therapists to distinguish between normal child misbehavior and a disordered behavior. However, disordered behavior can be characterized by many red flags, including high-intensity property destruction, deceit, stealing, and abuse to people and animals. In one behavioral disorder, Conduct Disorder (CD), the person affected shows repetitive behaviors that indicate a complete disregard for social norms and the rights of others. This can cause future psychiatric and social problems, like isolation. If left untreated, CD can lead to serious and even criminal-like behaviors later in life. The current study proposes the need for a solely-systemic based treatment that places a heavy emphasis on the role of school psychologists in the treatment of CD. It has been found that school psychologists are largely not utilized to their full potential due to the general public's lack of knowledge about their purpose. School psychologists could play a huge role in ensuring that a child's time at school, where a majority of their time is spent, is conducive to positive interactions and prosocial behaviors. By placing an importance on getting the child the help that they need to succeed in a structured classroom environment, school psychologists could help them to transfer those behaviors to settings outside of

school. This argument will be made through a summary of various literature about CD and current treatments. These include prevention planning- beginning whenever red flags emerge, cognitive behavioral therapy (interpersonal skills training, parent-child interaction therapy, and rational-emotive therapy), and the use of medications to cap aggressive behaviors. Looking at these treatments critically, the need for a solely-systemic based treatment that places a heavy emphasis on the role of school psychologists is evident.

54. Diaz, Alma

Discrimination and Mental Health among Latino Students: Does Self-Reported Skin Color Matter?

Undergraduate - Psychology

Nearly 80% of Latinos report experiencing discrimination, with these experiences found to be associated with poor mental health. However, previous studies find that darker-skinned Latinos report higher levels of discrimination than lighter-skinned Latinos. Yet relatively little is known about how self-reported skin color may shape the association between discrimination and mental health among Latinos. Consequently, the goals of this study were to: (1) examine the relationship between perceived everyday discrimination and depressive symptoms; and (2) determine whether self-reported skin color moderates the association between discrimination and depressive symptoms among Latino college students. To investigate these questions, we employed a sample of 103 self-identified Hispanic/Latino undergraduate students (ages 18-29) at the University of Illinois at Chicago. Measures included the Everyday Discrimination Scale, the New Immigrant Survey (NIS) Skin Color Scale, and the Center for Epidemiological Studies-Depression scale. It was hypothesized that everyday discrimination would be associated with greater depressive symptoms, and this association would be stronger for Latinos with self-reported darker skin compared to those with lighter skin. Results from our final regression model revealed it was significant $F(7,93) = 5.73$, $p = 0.000$ accounting for 30% of the variance in depressive symptoms. Everyday discrimination was associated with higher levels of depressive symptoms ($b = 0.32$, $p = 0.000$), independent of skin color and controlling for sociodemographic characteristics. Contrary to our predictions, self-reported skin color did not moderate the association between discrimination and depressive symptoms ($b = -0.01$, $p = 0.69$). Our findings suggest that universities and college counseling services should be attuned to discrimination experiences when treating or working with Latino students. Addressing the role of discrimination in Latino college students may not only help us understand mental health disparities faced by this segment of the college population, but also help us better understand educational disparities.

55. Dileep, Anandu; Dickens, Carolyn; Groo, Vicki L.; Shroff, Adhir; Wilkie, Diana J.; Zhongsheng, Zhao; Yingwei, Yao and Boyd, Andrew

Exploration of Factors Affecting Adherence After Use of a Mobile Application Focused on Cardiology Medication

Undergraduate - Kinesiology and Nutrition

The objective of this pilot study was to analyze the interventional group in a randomized control trial that studied a tablet based application, which aims to improve medication adherence. The “My Interventional Drug-Eluting Stent Educational App” (MyIDEA) dealt with Dual Antiplatelet Therapy: thienopyridine cardiology medications and aspirin. MyIDEA is a patient centered educational tablet application designed for use in hospitals and outpatient settings following a percutaneous coronary intervention where a drug eluting stent was placed. Medication adherence is the only modifiable risk factor after the procedure. Failure of medication adherence leads to a 7-fold increase in death. Medication adherence was tracked using pharmacy thienopyridine medication refill data. Pharmacy data was used to calculate proportion of days covered (PDC). PDC is calculated by dividing number of days covered for medication by number of days in a period. A good PDC score is $\geq 80\%$. MyIDEA has a recording interface for participants to respond to hypothetical patient stories. These stories demonstrate challenges in medication adherence such as monetary restrictions and side effects. After consenting to the study, subjects completed the 36-Item Short Form Survey (SF-36), assessing quality of life. All interventional participants completed the MyIDEA program at least once taking 20:42 min ($SD = 8:26$). For the interventional group of 13 subjects, we examined the correlations between PDC values and the time on MyIDEA, as well as their SF-36 scores for all 8 sub scores. There is no significant correlation between PDC and the time subjects spent using MyIDEA. However, the only sub-scores with a link between PDC are emotional health, role-emotional and social health with a p-value of 0.02, 0.03, and 0.04, respectively. Some quality of life sub-scores reveal a correlation to an individual’s medication adherence. Additional research is needed to explore patients and the potential promise of mobile tablet based technology.

56. Dobria, Paul; Farruggia, Susan P. and Han, Cheon-woo

Financial Determinants of College Student Dropout

Undergraduate – Psychology

College students frequently cite financial difficulties among the top reasons for dropping out. In exit interviews of non-returning college students, financial difficulties often accompany academic struggles as the most commonly stated cause for departure. The aims of this investigation were 1) to determine the relative importance of several financial reasons in informing students’ decision not to re-enroll; and 2) to measure the impact of student background and financial aid variables on measures of financial instability. Data for this study were obtained from a cohort of 256 first-year, non-returning students via the

administration of a Freshman Exit Survey used to collect information on multiple reasons for student dropout. In addition to responses to a 9-item financial instability subscale, the study also included several student background and financial aid variables. Survey responses were analyzed using the item response theory framework, which produced a measure of financial instability for each student and a measure of endorsement difficulty for each item. Multiple regression was employed to determine if the covariates of interest were significant predictors of student measures of financial instability. Students reported experiencing a negative change in their personal financial situation and having an outstanding tuition balance to be the top reasons for dropping out. Negative changes in their family's financial situation was a close second, followed by not having realized or anticipated the full cost of attending university. Of the covariates considered in this study, only satisfactory academic progress impacted student financial instability measures significantly. From a financial standpoint, the decision to drop out can be contextualized in terms of personal circumstances and beliefs. In light of students' changing financial circumstances playing such an instrumental role in their decision not to re-enroll, more institutional safeguards need to be in place in order to prevent student attrition due to financial factors.

57. Duran, Elmer

The Illinois Pension Crisis: in the Hands of A Corrupt State

Undergraduate - Finance

Through the normalization in corruption in the Illinois state and local governments, Illinois' politicians have buried the State of Illinois in one of the worst modern day pension and municipal debt crisis in order to advance their immediate agendas, stay in power, maintain luxurious pension plans and enhance their political image while disregarding the repercussions to Illinois taxpayers. Previous analysis on Illinois' current pension crisis makes it easy to see that a pension reform is necessary. I will review work that details how the Illinois pension obligations continue to grow at an exponential rate digging the state's economy into a deeper hole every day that a reform is not made. I will argue that the crisis that we are in today is a result of a culmination of inconsiderate decisions made by possibly corrupt lawmakers that should have been easily dismissed but were not for reasons unknown to the public.

58. Eickelberg, Victoria

Physical Activity and Well-being in College Students

Undergraduate - Psychology

When students transition to college they experience a new independent environment, rigorous course load, financial responsibilities, and many more new and challenging experiences. These new experiences can lead to increases in stress, which can result in

poor mood or harmful behaviors. In order to combat the harmful effects of stress, universities provide students with a variety of resources, including but not limited to, counselors, tutors, and academic help centers. However, physical activity is often overlooked as a means of handling everyday stressors and negative mood. Despite evidence of the benefits of physical activity for college students' mental health, many students are not utilizing physical activity as a strategy for stress reduction and mood management. Understanding the individual and contextual factors that promote college students' participation in physical activity is important in the creation of effective interventions to promote physical activity. The objective of this study is to use ecological momentary assessments to measure college students' current states of mood and stress throughout the day, as well as, self-reports of physical activity. The Microsoft Band will supplement the physical activity data by providing an objective measure of physical activity. It is hypothesized that higher levels of physical activity will be related to decreased stress levels and increased mood. In addition, increased levels of physical activity will occur when participants are with friends, in close proximity to places where physical activity takes place, occur most often during the weekdays, and when the participant has physical activity equipment available at home. A preliminary conclusion may suggest that students will experience increased mood and decreased stress levels when participating in physical activity with friends. Furthermore most of the physical activity will occur outdoors or at the gym during the weekdays.

59. Elagha, Noor; Burkett, Candice; Blair, Alyssa and Goldman, Susan R.

Scientific Text and Graph Comprehension through Identification of Discrepancies

Undergraduate – Psychology

Learning about scientific phenomena is reliant on the ability to comprehend the relationship between information in multiple representations (e.g., text and graph) (Glazer, 2011; NGA & CCSSO, 2010; as stated in Burkett, Goldman & Britt, 2014). This includes the detection of discrepancies/contradictions between representations. Research shows that undergraduates detect discrepancies between texts (Stadtler, Scharrer, Brummernhenrich & Bromme, 2013), but whether or not they do so between text and graph is less clear. The purpose of this study was to investigate undergraduates' ability to detect contradictions between science texts and graphs. Undergraduates (N=80) were given a packet that contained 12 distinct passages accompanied by a graph. The participants were told to read the passage and accompanying graph, and answer "yes" or "no" whether the information presented in the text matched what was presented in the graph, and to justify their conclusion. The study had two manipulations: 1) how the relationship between two variables was presented in the text, whether it was explicitly stated or the student had to make an inference from the text, and 2) whether a graph depicting the relationship between the two variables was consistent or contradictory with the text. We predicted that the participants would correctly identify contradictions/consistencies between the information presented in the text and an accompanying graph, but that they will be more accurate when the relationship between variables was explicitly stated. Results of a two-way within subject Analysis of Variance

(ANOVA) in which the independent variables were text/graph agreement (agreed vs. contradicted) and relationship statement in text (explicit vs. inferred) on the dependent variable (correctness of their consistency judgment) suggested that participants were, in fact, able to correctly identify contradictions between text and accompanying visual representation, but showed better performance when the relationship was explicitly stated compared to when it had to be inferred.

60. Elfar, Amy; Thuruthikara, Annrose; Hoffman, Lisa; Isaamullah, Mir and Sharma, Kamal

Optogenetic Investigation of Neuronal Functions in Mice

Undergraduate - Anatomy and Cell Biology

We are trying to understand the function(s) of a class of glutamatergic neurons that are generated throughout the hindbrain and spinal cord during embryonic development. These neurons can be defined by the expression of the post-mitotic transcription factor, Chx10, and are excitatory in nature (Crone 2008; Peng et al 2007). Previous studies in our lab have defined the role of these neurons in speed dependent control of gait and breathing in neonatal mice (Crone et al 2009; Crone et al 2012). Recent studies in the lab have shown that following genetic ablation of V2a neurons; mice show severe disruption of the sleep-wake cycle (Khuzandaivel and Sharma, manuscript in preparation). The main goal of my collaborative project is to use optogenetics to understand the role pontine V2a neurons in regulating the sleep-wake behavior in mice. We have found that short-term optical stimulation of V2a neurons in SPTg (subpeduncular tegmental nucleus) results in cessation of motor activity and simultaneously increase theta oscillations in the mouse cortex. These results show that SPTg-V2a neurons have dual role in control of ongoing motor and cortical neuron activity.

61. Elkhadra, Dania

Assessment of Balance In Stroke Patients

Undergraduate - Biological Sciences

Hemiparesis effects approximately eighty percent of stroke victims and causes balance instability. In the past few years, the scientific community has aimed to incorporate innovative technology, such as Wii Fit. The objective of this study was to compare clinical assessments of balance against that of the Wii Fit in post-stroke patients. Fifty-four participants between the ages of 40 to 80 years old partook in clinical test assessments; thirty-nine participants were assessed clinically and via the Wii Fit. Measurements from clinical tests and Wii Fit test assessed static and dynamic balance of the post-stroke participants. Clinical tests included Berg's Balance Score (BBS) and Mini Balance Evaluation System Test (Mini-BESTest). Evaluations of the measurements gauged the effectiveness of these tests to provide the necessary insight to the balance stability of the post-stroke participant in order to reduce falls.

62. **Withdrawal**

63. Esguerra, Litany

Self Perceptions of Disability and Impairment in an Indian Prosthetic Population using Jaipur Foot Technology

Undergraduate - Rehabilitation Sciences

Twenty-nine first time and repeat prosthetic users were interviewed over a period of three weeks to determine how they perceived their own disability at Bhagwan Mahaveer Viklang Sahayata Samiti, or Jaipur Foot, located in Jaipur, India. The questions delineated different aspects of people's disabilities and impairment and asked questions regarding social, economic, political, and other contexts, influenced by the conceptual framework of the International Classification of Functioning (ICF). The study analyzed all of the factors as specified by the questionnaire and found many varying trends over all types of prosthetic users. The study also used the ICF to determine whether or not it can be used in the scope of this study. Notable trends found few differences between the social support surrounding a person had and whether or not the person was a first time or repeat prosthetic user, as well as a general limitations due to political factors. Overall, the study found that since there were no distinct trends, it was consistent with the changes in the perception of disability in India. Current needs call for increased support for progressive disability-related legislative policy, resource centers, more accessible buildings and transportation, and increased awareness of people with disabilities in general.

64. Espinosa, Cynthia

Before and After the Election of Bruce Rauner: A Systematic Analysis of Media Reports on People with Disabilities

Undergraduate - Disability and Human Development

For the past couple of years, the state of Illinois has been stuck in an economic crisis. The current Governor of Illinois is Bruce Rauner who was elected on January 12, 2015 with promises of fixing this crisis. Rauner's agenda consists of policy priorities that include structural reforms and austerity measures or spending cuts. Previous research has shown that austerity measures negatively impact the most disadvantaged populations, including people with disabilities. Other research has shown that austerity measures have negatively changed representations of people with disabilities in the media. To see whether this same phenomenon has occurred in the city of Chicago, I performed a content analysis of newspaper articles of the Chicago Tribune three months before Rauner came into office and another three months after he has already been in office for a year. The results showed that far more newspaper articles viewed disability using the medical model in the

three months after than the three months before, where the social model clearly dominated. After Rauner came into office, representations of people with disabilities in the media shifted from a social model to a medical model perspective, which often views people with disabilities as something needed to be cured or fixed. This goes against what a lot of people with disabilities believe in and it can influence how others see, judge and treat people with disabilities.

65. Evangelista, Deniz

Effects of Exercise on Cognition in the Geriatric Population

Undergraduate – Nursing

The purpose of this study was to determine if physical activity is positively associated with cognition scores within the older adult population based on the assessments administered within the scope of Fit & Strong!, an evidence-based exercise intervention. The sample consisted of 57 individuals, who are overweight with lower-extremity osteoarthritis. Cognitive assessments were performed before the exercise intervention (baseline) and at the 2-month period after the exercise intervention (first post-test). Scores were analyzed from three different measures: California Verbal Learning Test – Second Edition (CVLT-II), Trail Making Test (TMT), and the Symbol Digit Modalities Test (SDMT). The independent variable was the exercise intervention, and the dependent variables were the subject's cognition scores. This study concluded that physical activity is directly associated with cognitive functioning as evidenced by an increase in cognition scores from pre- to post- intervention. With the "Baby Boom" generation aging, implications for nursing and public health include advocating for healthier lifestyles and using these findings to encourage patients to exercise to slow cognitive decline, and overall, improve quality of life. This could foster further research for other populations, such as cognitively impaired older adults. Keywords: Fit and Strong, Exercise and cognition, Aging population in the U.S.

66. Everin, Olivia; Dickens, Carolyn; Groo, Vicki L.; Shroff, Adhir; Wilkie, Diana J.; Zhao, Zhongsheng; Yingwei, Yao and Boyd, Andrew D.

Exploration of Factors Affecting Medication Adherence Following the use of a Tablet-Based Application

Undergraduate - Biomedical and Health Information Sciences

The objective of this pilot study was to examine the effects of a tablet-based application on an interventional group, who had all undergone a percutaneous coronary intervention, with the purpose of improving patient medication adherence. The "My Interventional Drug-Eluting Stent Educational App" (MyIDEA) dealt with Dual Antiplatelet Therapy, which requires thienopyridine cardiology medications and aspirin to be taken regularly. The MyIDEA is an educational application that aims to inform patients, who have just received a drug eluting stent, on how to properly take their medication. The MyIDEA

provides patients with a recording interface that allows them to respond to theoretical patient stories, which exhibit challenges that many patients face when taking their medication. The MyIDEA consists of 40 slides, in which 5 require the patient to record a response. After consenting to the study, 17 subjects recorded responses at least once, and up to three times. Before any calculations were made, each subject was categorized as engaged or not engaged based off of two factors: length of time spent talking and tone of voice. Of the 17 subjects, 6 were identified as engaged. The recorded responses were obtained, transcribed, and evaluated on the basis of length of time the subject talked, which was calculated using adobe audition. The average time each subject talked, for each visit, was calculated. Times for subjects with multiple visits were averaged. Overall, subjects categorized as engaged had a mean of 14.9 seconds (SD 10.8), while subjects categorized as not engaged had a mean of 3.6 (SD 2.07). Levene's test for equal variance yielded a test statistic of 10.6, indicating great difference in variance between groups. Therefore the correlation between the lengths of time spent talking and engagement of the patients is not statistically significant. However, further research is needed to explore the concept of engagement.

67. Fagan, Michael

Modeling Revenue Generated by Chicago's Red-light Cameras

Undergraduate - Mathematics, Statistics, and Computer Science

With 300 cameras handing out \$100 tickets per infraction to motorists, Chicago's red-light camera system brings in a tremendous amount of revenue to the city each year. However, little is known about the efficacy of red-light cameras as a revenue-generating endeavor. Prior research has focused on whether red-light cameras improve safety conditions at intersections. In this paper, we provide a model for the number of tickets issued by the red-light system using time-series analysis. This model, by extension, represents the revenue generated by the system. In this manner, we aim to show that the benefits of a red-light camera system to a city may not be limited to - or primarily focused on - safety on the roads.

68. Farler, Michelle; Weidner, Arin and Coumbe-Lilley, John

Climbing Across Cultures: An International Community Rooted in Flow

Undergraduate - Kinesiology and Nutrition

This autoethnography explored if members of climbing communities can connect, forming relationships across cultural barriers. I aimed to examine if the mutual understanding of rock climbing as a pure leisure experience, due to the freedom of choice and personal investment, provided support of self-determination (Kiewa, 2001). I began climbing 2.5 years ago and was welcomed into the local climbing community soon after. The community proactively creates an environment for relatedness through shared

experiences such as the mental challenges faced when climbing (Ryan, 2000). I experienced a similar feeling of acceptance and inclusiveness when climbing in Spain at local gyms and outdoor climbing crags. I found the connectivity between climbers rooted in emotions of authenticity generated when climbing and an unspoken understanding between climbers of these experiences (Ricky-Boyd, 2012). A layered autoethnographic approach was used to reflect and analyze personal experiences, informal interviews, and conversations with climbers in Chicago and Spain. Discussions of other climbers' experiences helped me to understand my own experience and support my observations (Ellis, 2010). Throughout periods of reflection and analysis, several themes emerged: The acceptance of outsiders into a climbing community is based on the recognition of mutual experiences exclusive to climbers creating a unique bond unidentifiable to non-climbers. Csikszenmihayli (1990) discusses the feeling of authenticity achieved when an individual is physically and mentally challenged using the term "flow" to describe the full body experience. This supports the autonomy needed in self-determination. Ricky-Boyd (2012) elaborates on this term applying it specifically to rock climbers observing climbing's link to "moments of existential authenticity." The freedom and control associated with these pivotal moments in climbing are the root for the climbing community, which may allow them to overlook traditional barriers such as language or nationality and contribute to the relatedness and self.

69. Felesena, Nicholas; Dong, Yangbasai; Zhang, Min; Tang, Haiyang; Machado, Roberto F. and Jiwang Chen

Brahma global knockout and Brg1 Endothelial or Smooth Muscle Cell Specific knockout mice are Protected Against Hypoxia Mediated Pulmonary Hypertension

Undergraduate - Biological Sciences

Brahma (Brm) and Brahma related gene 1 (Brg1) are two important ATP-dependent chromatin remodeling complex members. They have helicase and ATPase activities and are thought to regulate transcription of certain genes by altering the chromatin structure around those genes. Brm and Brg1 work to activate or repress transcription of certain genes and they play essential roles in the development of smooth muscle cells. Scientists have recently reported that Brm and Brg1 expression levels are upregulated in pulmonary artery smooth muscle cells under hypoxia exposure. We hypothesize that Brm or Brg1 inhibition may protect hypoxia mediated pulmonary hypertension. Brg1 global knockout mice are lethal. In this study, we first generated endothelial cell (EC) or smooth muscle cell (SMC) specific Brg1 deficient mice ($\text{Brg1}^{\text{flox/flox}}\text{SclCre}^+$ and $\text{BRG1}^{\text{flox/flox}}\text{MHCCre}^+$). Using these tamoxifen inducible Brg1 conditional knockout mice and Brm global knockout mice, we examined if they were protected from hypoxia-mediated pulmonary hypertension. After a 4-week hypoxia (10% O₂) exposure, they have significantly lower right ventricular systolic pressure (RVSP) and right heart hypertrophy, demonstrated by lower right ventricular (RV)/left ventricle+septum(LV+S) weight ratio. We first demonstrated that Brm deficiency or Brg1 endothelial or smooth muscle cell specific deficiency is protected from hypoxia-mediated pulmonary hypertension.

Inhibition of Brg1 or Brm may have therapeutic effect for the treatment of pulmonary hypertension.

70. Flores, Marissa

HR Today: Is There Such a Thing as the Perfect Balance?

Undergraduate - Management

I have identified the top 5 best places to work for in Fortune's annual list of best places to work for, in 2016. The top 5 best places to work for are the following: 1. Google, 2. Acuity, 3. Boston Consulting Group, 4. Wegmans food markets, and 5. Quicken Loans. To have satisfied employees, these companies must have Human Resources (HR) practices that enables them to continue to accomplish this and therefore consequently the company does better leading to financial success. The HR practices that I have chosen to use to illustrate employee satisfaction are the following: compensation/rewards, training, and selection/hiring. Looking at such practices will help assess their impact on the success of a company as a whole. By looking at the most successful HR departments among these companies, I can assess their importance on meeting employee needs against the company's needs. Lastly, I would be able to make my own recommendation regarding the question I'm trying to answer, is there such a thing as the perfect balance? By this I mean, are HR departments spending more time solely on company objectives or are they investing more in helping employees?

71. Flores, Martin; Hwang, Changwa and Njongmeta, Leo

Development and Implement of Effective Food Safety Program at UIC

Graduate/Professional - Environmental and Occupational Health Sciences

Approximately 1 in 6 Americans are sickened, 128,000 hospitalized and some 3,000 die annually due to foodborne illnesses according to the United States Department of Agriculture data. Thirty-four food establishments comprising dine-in cafeterias, fast foods, coffee shops and convenience stores serve the UIC campus community and visitors. The Environmental Health and Safety Office (EHSO) conducts sanitation inspections to ensure food is prepared in a clean environment, held and served at the appropriate cold or hot temperature in compliance with existing Illinois State and Federal regulations. The main objective of this study is to conduct a retrospective analysis of food inspection results over a two year period to determine if the number of deficiencies correlates with the type of food establishment. A Compliance Index (CI) will be calculated using the IDPH classification of food establishments (Low to high risk) matrix and the average number of food safety deficiencies for the two year period. Information gained from this study will be used to guide prioritization of food sanitation inspections, providing support for frequent food sanitation inspection of high risk compared to low risk food establishments.

72. Fogel, Jessica; Rubin, LH; Maki, PM; Keutmann, MK; Gonzalez, R; Vassileva, J and Martin, EM

Effects of Sex and HIV Serostatus on Spatial Navigational Learning and Memory Among Cocaine Users

Graduate/Professional - Psychology

Aim: Although cognitive impairments such as verbal memory and executive function have been well documented in HIV-infected individuals, less is known about effects of HIV on spatial learning/memory. The purpose of this study was to investigate spatial learning/memory performance among HIV-infected vs HIV-uninfected men and women with a history of cocaine-dependence. Methods: Participants included 67 HIV-infected and 114 HIV-uninfected cocaine-dependent individuals enrolled in a larger study on effects of Sex and HIV Serostatus on neurocognition. Participants were assessed on confounding conditions comorbid with substance use including mood disorder, PTSD, ADHD, and antisocial personality disorder. Participants were administered the Memory Island Task which required individuals to traverse a virtual island and locate (visible trials) and recall (hidden trials) different objects. Performance included indices of spatial learning, immediate, and delayed recall. Results: Visible Trials: There was a significant Sex x HIV Serostatus interaction for total number of successful trials ($p = 0.02$). Specifically, HIV-infected men completed more visible trials than HIV-infected women ($p = 0.04$). There were no significant differences between HIV-uninfected men and HIV-uninfected women on total number of visible trials ($p = 0.25$). Hidden Trials: There was a significant main effect for Sex, with faster times to completion among men compared with women ($p = 0.01$). Delayed Recall: There was a significant main effect for HIV Serostatus, with significantly poorer performance on the delayed recall trial among HIV-infected compared with HIV-uninfected individuals ($p = 0.01$). No other significant main effects or interactions on memory island outcome measures were found. Conclusions: Consistent with previous work on verbal memory, sex and HIV serostatus influence learning, immediate, and delayed recall on spatial memory tasks among individuals with a substance use history. Additional studies are needed to examine the neurobiological substrates of this effect that may involve the hippocampus, parietal lobe, and/or prefrontal cortex.

73. Folvarska, Maria

Doukhobor Shifts in Identity: From Memory to History

Undergraduate - History

This project investigates the construction of identity within the religious dissident community of the Doukhobors through the lens of Pierre Nora's "Lieux de memoire" after their migration from the Russian Empire to Canada at the end of the 19th century. My

research traces the transformation of the shared living experience and oral traditions of the Doukhobor community into a community of memory and recorded history, and the impact this transformation had on Doukhobor collective identity. In exploring – for the first time in historiography – works produced by distinct members of the Doukhobor community (in both Russian and English languages), specifically Alexey Popov, Jim Popoff, and Simeon Reibin, I rely on Nora’s ideas of memory and history to examine the conceptualization of Doukhobor identity and national belonging. In addition, I trace the dialectic of memory and history in the identity-making of two Canadian Doukhobor journals, which primarily target younger audiences who never had any direct connection to Russia or an “organic” communal life as their predecessors. Some questions that I will try to address in my research are: How did Doukhobors perceive themselves as they relocated to Canada? How did this self-understanding shape their national and religious identities? How did these people understand their relationship with Russia and the recipient society? How did their oral tradition acquire the form of individual memories and then history? By exploring these questions, the project sheds light on modern-day conceptions of Doukhobor history and identity, as well as the processes of emigration and identity making and remaking in general.

74. Ford, Ni-ka; Lebowicz, Leah; Odems-Young, Angela, Daugherty, John and Wurl, Denise

Creating Educational Materials to Increase Participation and Retention in the Supplemental Nutrition Program for Women, Infants, and Children (WIC)

Graduate/Professional - Biomedical and Health Information Sciences

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), is a Federally-funded nutrition program designed to assist low-income pregnant, postpartum women, infants and children who are found to be at nutritional risk. WIC provides Federal grants to states to support supplemental food requests, healthcare referrals, social services, nutrition education, and counseling at WIC clinics. Despite its high enrollment rates, many participants, especially children, leave the program before their eligibility expires. A lack of awareness about the benefits that WIC has for children is a factor in the steady decline of participation. The project will provide local WIC clinics in Chicago with educational marketing materials that inform participants about the benefits of WIC's food program for young children. This research investigates how educational illustrations and a mobile application can be designed to increase participation and understanding of the importance of nutrition in child growth and development within the WIC program. A set of four posters were designed that visually depict the importance of a healthy diet for child growth and development from birth to five years of age, as well as a mobile application designed to build upon the WIC participant's knowledge of WIC eligible foods and healthy recipes for young children. Through a focus group, WIC participants will discuss what they feel would make nutrition education more valuable to them. The research proposes to increase participation and retention in WIC by recognition of the value of the supplemental foods offered in the program, thereby diminishing some of the constant barriers to retention. The project is expected to improve health behaviors of WIC eligible children.

75. Fountain, Willard

Adult Hematopoietic Stem Cell Transplantation to Prevent Frequent Painful Sickle Cell Episodes

Undergraduate – Nursing

BACKGROUND: Adults with sickle cell disease (SCD) are hospitalized for frequent pain episodes. Nurses are in a pivotal position to assist adults to learn about a therapy that can prevent frequent pain episodes. Currently, supportive and preventive measures are the standard treatment for preventing pain episodes. However, a therapy option, hematopoietic stem cell transplantation (HSCT), can prevent frequent pain episodes in adults that can significantly reduce morbidity and mortality and improve health-related quality of life (HRQoL). **PURPOSE:** This project reviews the literature on SCD, the procedure of HSCT, chimerism to explain the reduction of pain episodes, and the benefits, limitations and barriers of HSCT. **METHODS:** Using CINAHL, PubMed and Medline, the combined search terms and phrases, “hematopoietic stem cell transplantation for adults with sickle cell disease,” “sickle cell disease pain episodes,” “therapy for adults with sickle cell disease” were entered. Information from the articles were entered into data analysis matrices and then were summarized. **FINDINGS:** Four categories reflect the purpose of the review. SCD is a genetic condition with a substitution in the beta hemoglobin chain; the shape and function of hemoglobin results in blood vessel obstruction and painful episodes among other complications. HSCT is a demanding therapy that replaces sickled red blood cells (RBCs) with healthy, regenerative RBCs from a healthy donor based on chimerism. Various HSCT benefits are supported by research studies including over 90% disease and event-free survival rates and improved HRQoL. Limitations encompass graft failure and graft vs. host disease, post-transplant complications and risk of death. Barriers include limited donor availability, specific eligibility criteria, cost issues and lack of controlled trials. **CONCLUSIONS:** This review provides a summary of important information from the literature and can educate nurses about HSCT in adults with SCD to reduce frequent pain episodes.

76. Frystak, Alyssa

Appropriating Historic Structures for Affordable Housing

Undergraduate – Architecture

Beginning in the Twentieth Century, federal, state, and local governments took on the responsibility of providing working-class residents with safe, decent, and affordable housing. This has taken many forms throughout the years, including high- and low-rise public housing complexes, scattered site properties, and voucher programs. Due to lack of funding, mismanagement, and neglect, a great majority of these developments fell into disrepair and have since been demolished, leaving a shortage of housing options for

society's less fortunate. At the opposite end of the spectrum, it has been argued that the field of historic preservation is an elitist practice, generally only exercised by those with substantial means. Even within the historic preservation sector itself, debates have been waged over claims that historic buildings and districts hinder access to affordable housing and play a role in perpetuating income and racial inequality. This project investigates the intersection between these two practices and examines the ways in which they can be combined in order to combat the affordable housing crisis. First, it examines the history of public housing in Chicago. Next, it demonstrates the polarized nature of the city through an investigation of city-owned land and historic preservation data. It then introduces the barriers that discourage the use of historic structures for the creation of affordable housing. Finally, a case study is presented that successfully utilizes a historic landmark for use in affordable housing. Through this examination, I will argue that historic preservation can effectively be used to combat the shortage of affordable housing within our community.

77. Galindo, Briana

Trauma Similarities in Individuals That Score High in Schizotypal Personality Traits

Undergraduate – Psychology

This project explores whether there are similarities in trauma history between people that score high in schizotypal personality traits, also, whether there are differences in trauma history in those that score high versus those that score low in having schizotypal personality traits. There has not been extensive research on the specific traumas that individuals with schizotypal personality traits experience. Considering the controversy this phenomenon has in psychology, it is worth understanding specific characteristics that might make someone have schizotypal personality traits. This study did not use individuals that were diagnosed with schizotypal personality disorder, however, the participants took a personality self-report questionnaire. Those that scored high and those that scored low for schizotypal personality traits were then used for the study. The participants were asked to tell their life story and their answers were voice recorded. The stories varied, some had similar traumatic events (e.g. parents divorced, death of a loved one) and others seemed to not have any significant traumatic events in their life. After listening to all the interviews, a scale was created for all the noteworthy traumatic events. The scale reflected the type of event and how many participants experienced that event. With the use of the scale and statistical analysis the similarities and differences between the two groups were obtainable.

78. Garcia, Miguel

Do Human Caused Disturbances Affect the Species Richness of Bees in an Urban Setting?

Undergraduate - Biological Sciences

It is a wide concern that pollinators—bees specifically—may be in decline. Many believe that human-caused habitat loss and constant disturbance of these habitats is the cause for this decline. In the field of ecology there is a theory known as the Intermediate Disturbance Theory that states an ecosystem's level of disturbance and its species richness is related. The extremes of disturbance, no disturbance and constant disturbance, yield the lowest values for species richness. However, there is belief that a certain spot in the middle—a ‘sweet spot’—exists that boasts the maximum amount of species richness at or near a median level of disturbance. If this is true, human disturbance may not be the only factor affecting bee and pollinator populations. Utilizing the Intermediate Disturbance Theory, I looked at vacant lots around the Chicagoland area with varying levels of disturbance which was defined as mowing of the lot by the city of Chicago. Species richness of pollinators in vacant lots around Chicagoland was expected to fluctuate depending on frequency of disturbance. The trend should follow a negative parabolic function with the maximum species richness being a ‘sweet spot’ of disturbance. Pan traps were set out to capture insects which were then pinned and separated into bees and non-bees. The bees collected were differentiated into species based on morphological differences and their occurrence in each lot was recorded. The Simpson index was used to determine biodiversity of bees. This data was graphically manipulated for further analysis and to visualize differences of biodiversity between lots. Lot graph data was compiled into one graph of biodiversity versus frequency of disturbance.

79. Garcia, Nancy

Understanding Disability Through Pre-natal Funding

Undergraduate – Sociology

The use of prenatal testing is growing worldwide. Funds from the Interagency Autism Coordinating Committee (IACC) and the National Institutes of Health (NIH) are being funneled into the causal mechanisms and early detection of autism, ultimately for the prevention of autism and other cognitive disabilities. With the use of prenatal testing, there is growing demand for autism detection during pregnancy. Within a pro-choice agenda, many argue that there is a right to terminate a pregnancy, especially when children with disabilities are seen as in need of costly services (Stabile & Allin, 2012). This research highlights how the prioritization for the prevention of autism contributes to the stigmatization of people with disabilities in our society. The expansion of early detection emphasizes the idea that disabilities need to be avoided. A reproductive justice framework and theory brings human rights to an understanding of the right to have a child, not have a child, or access resources in order to parent a child in a sustainable environment (Sister Song). I will use this theory to argue for a reallocation of resources. Funding priorities of the IACC and NIH overshadows the need for resources for people with disabilities. Thus, by reallocating funds to social services that ensure that people with disabilities live in accessible environments, there will be less of a stigma regarding people with disabilities, ultimately reducing selective abortion based on ability.

80. Gattu, Vineeth Kumar; Indacochea, J Ernesto; Ebert, William L. and Cruse, Terry A.

Long-Term Electrochemical Corrosion of a HT9 Based Alloyed Nuclear Waste Form

Graduate/Professional - Civil and Materials Engineering

An electrochemical testing protocol is being developed to measure the corrosion behavior of waste forms made by alloying metallic fuel waste that remains after electrochemical processing of spent nuclear fuel with cladding hulls, contaminated hardware, and added trim metals. The release of radionuclides from alloyed waste forms must be predicted over the service life of disposal systems to ensure regulatory limits are met. Understanding the corrosion mechanisms of host phases containing the radionuclides and a scientific basis for experimentally measured durabilities will provide confidence in long-term performance predictions. Developmental studies conducted during the past several years have led to a mechanistically-based model for predicting long-term corrosion kinetics for iron-based alloys and the laboratory testing protocol to parameterize that model. A representative alloyed waste form RAW-6 was made to represent waste forms with HT9 cladding and a mixture of metallic fuel wastes generated during electrochemical processing of spent U-10Zr metallic fuel with trim additions of Cr, Ni, and Mo to enhance the corrosion resistance. Small specimens cut from the RAW-6 material were fabricated into electrodes for use in electrochemical tests. Tests were conducted in various electrolyte solutions to impose a range of chemical effects (primarily pH and Cl⁻) and a potentiostat was used to impose a surface potential representing the solution Eh. Potentiodynamic (PD) scans and Potentiostatic (PS) tests were performed to characterize the corrosion behavior. The corrosion currents were measured at various imposed potentials, with electrochemical impedance spectroscopy (EIS) performed daily to measure the electrical properties of the corroding surface. Surfaces of the electrodes were characterized by SEM/EDS before and after the electrochemical tests to compare and identify the active-passive phases. Solutions collected during and at the end of the PS tests were analyzed using inductively-coupled plasma mass spectrometry (ICP-MS) to correlate mass releases with the corrosion currents. Key results of electrochemical tests conducted on RAW-6 specimens will be summarized to demonstrate the use of these results in performance modeling. Analytical functions were derived for modeling the Eh and pH dependence in the degradation model. Surface stabilization corresponding to the Eh-pH stability regions of passivating oxides decreases corrosion rates by ~100X. The trim metal additions improve the corrosion behavior of a ferritic steel (HT9) by preventing the carbide formation and by passivation. Noble metal fission products in the fuel waste provide catalytic passivation. Solution analyses used to relate electrochemical corrosion currents to mass release rates are correlate with surface characterizations that identify the active phase responsible for the release. Finally, Equivalent circuit models of EIS responses can provide confidence in using measured electrochemical kinetics to model waste form performance.

81. Geevarghese, Elizabeth and Fung, Leslie

Tertiary Structure Analysis of Human Brain Alpha and Beta Spectrin Coiled Coil Association at the Tetramerization Site

Undergraduate – Biochemistry

Spectrin is a skeletal protein that is located in the plasma membrane of eukaryotic cells. It acts as the “scaffolding” of the plasma membrane and spectrin is vital for skeletal structural integrity. The functional form of spectrin is a tetramer, in which human brain alpha and beta spectrin have coiled coil association at the tetramerization site. At this tetramerization site, two / dimer complexes interact in a “head-to-head” manner (Hill, 2013). Each spectrin dimer complex consists of one -subunit complex and one -subunit complex. The partial domain of the -spectrin, which consists of one helical domain at the N-terminus, is thought to associate with the partial domain of the -spectrin, which consists of two helices at the C-terminus (Fung, 2002). We proposed that the association between the -partial domain and -partial domain could be monitored with near-UV (250-350 nm) circular dichroism spectroscopy. This is the aromatic absorption region and thus may be able to monitor the tertiary structure (Correa, 2008). In my experiment, a mixture of α II-1-147 and β I-1898-2083 recombinant proteins was used. I then deconvolute the CD signals obtained to give the signals from mostly the tryptophan residues in the parial domain of -spectrin. I will show the differences in the -spectrin partial domain signals before and after the -spectrin associates with the -spectrin.

82. Ghassemi, Samaneh; Shen, Xiang; Agnihotri, Gaurav; Putra, Ilham; Rassouli, Yasmin; Eslani, Medi and Djalilian, Ali R.

The Effect of Rapamycin on Autophagy in Human Corneal Epithelial Cells

Undergraduate – Ophthalmology

Purpose: Rapamycin has been shown to have anti-aging effects in cells and animals. We have previously reported that rapamycin prolongs the survival of corneal epithelial cells in culture and prevents their loss to replicative senescence. In this study, we investigated whether rapamycin, at similar doses, increases autophagy in human corneal epithelial cells. Methods: Human primary corneal epithelial cells were cultured in serum-free media. The cells were treated with rapamycin or DMSO (control). The cell morphology and the expression of autophagy marker LC3 by immunostaining and Western blot were noted. Results: Rapamycin treatment of corneal epithelial cells induced the formation of vacuoles (autophagosomes) which were visible by light microscopy. The vacuoles were found to express LC3. Rapamycin likewise increased the expression of LC3 by Western blot. Conclusions: Rapamycin appears to increase autophagy in primary human corneal epithelial cells. This may in part explain the increased survival of corneal epithelial cells in culture.

83. Girotti, Daniela

Solvent Extraction Investigation using Brewster Angle Microscopy

Undergraduate – Physics

The formation of the metal-extractant complex is believed to occur primarily at the oil/water interface, though few direct measurements are available. Interfacial tension measurements demonstrate the significant surface activity of extractants, which tend to accumulate at the oil/water interface, where their encounter with metal ions is most likely to take place. Consequently, it is sensible to expect that physical and chemical processes at the oil/water interface determine the extraction selectivity and kinetics. Nevertheless, in spite of a large body of research on solvent extraction, no consensus exists on the fundamental processes that control the extraction kinetics. By using Brewster angle microscopy (BAM) to study the system of dihexadecyl hydrogen-phosphate (DHDP) and hexane over water, it is possible to better understand extraction through this surface specific process.

84. Goding, Karissa and Bell, Aleeca

The Birth Experience and Maternal Caregiving Behaviors: A Systematic Review

Undergraduate - Women, Children, and Family Health Sciences

Background: Poor maternal caregiving behavior can negatively impact a child's social, cognitive, emotional, and physical development. Research suggests that there may be an association between a negative birth experience and poor maternal behavior.

Understanding predictors of maternal caregiving behaviors that are amenable to intervention will lead to better childhood outcomes.

Purpose: To conduct a systematic review of the association between mother's postnatal perspective of their birth experience and subsequent maternal caregiving behaviors.

Methods: We systematically identified relevant articles using the data bases PubMed,

EMBASE, CINAHL, and PsychINFO. Search terms included the birth experience and MeSH terms of maternal attitude, maternal behavior, maternal child relations, maternal infant relations, parenting, birth, and parturition. Only articles in English and original

research from peer-reviewed journals were included. Studies were excluded if birth

variables were limited to only birth events (e.g., mode of birth). The initial search of

electronic databases produced 1696 records, which was narrowed to 37 studies for full

text review, resulting in 15 relevant studies. **Findings:** Nine of 12 quantitative studies

found a significant association between a positive birth experience and more optimal

maternal caregiving behaviors. All three studies using qualitative methods showed

impaired maternal caregiving behavior after a traumatic birth experience. **Limitations and**

potential for bias are discussed. Extensive heterogeneity in birth experience and maternal

caregiving behavior measures was found; thus, further investigation is warranted using

valid reliable measures. **Conclusions:** The evidence from this systematic review suggests

that a women's birth experience can impact her maternal caregiving behaviors. Healthcare

providers play an important role in creating a positive birth experience. As the implications may be long standing for both mother and infant, it is essential that healthcare professionals are cognizant of their influence on the mother's birth experience and strive in all circumstances to provide the best patient-centered care.

85. Golden-Trist, Avram; Kenig, Fabien and Zwick, Ari

Distribution and Origin of Contaminants and Psychoactive Substances in Aerosols Near UIC

Undergraduate - Earth and Environmental Sciences

The composition and distribution of extractable organic aerosols was analyzed from 18 samples collected between October 13, 2009 and November 24, 2009 next to the greenhouse of the Department of Biological Sciences on Halsted St. (Chicago, IL). The purpose of this project is to determine what airborne pollutants the University of Illinois at Chicago population is exposed to. These aerosols were analyzed by gas chromatography-mass spectrometry (GC-MS). The organic aerosols observed are characterized by a very large variety of sources. We could separate the aerosol in 6 categories as a function of their chemical composition, source, and/or use: 1) crankcase oil (branched and cyclic alkanes forming a UCM); 2) natural sources (e.g. plant waxes); 3) glycerol ethers (e.g. tetra-ethylene glycol); 4) PAH (e.g. anthracene and pyrene); 5) phthalates (e.g. diisobutyl phthalate) and 6) psychoactive substances (nicotine, caffeine, cocaine, tetrahydrocannabinol (THC), and cannabinol). A 7th group is formed by orphan compounds such as the insecticide DEET, organic UV filter Parsol MCX, or a chlorinated flame retardant. Used crankcase oil is by far the dominant source of organic aerosol in some of our samples and is present in all sample analyzed.

86. González, Gabriela

Sociological Analysis of Premenstrual Dysphoric Disorder/Premenstrual Disorder in English and Spanish Media.

Undergraduate – Sociology

Mass media assists in framing public perceptions of what discourse is socially acceptable when describing mental health issues. Negative stigmas associated with Premenstrual Syndrome (PMS) may dissuade those with Premenstrual Dysphoric Disorder (PMDD)- which is less prevalent, yet more debilitating- from seeking medical advice or treatment. I reviewed English and Spanish media in the form of newspapers, blogs, online journals, videos, and television programming in order to examine the framing of discourse commonly associated with PMS and the recently acknowledged PMDD. Matters associated with women's menstrual cycles were often written about and portrayed in a detrimental light within mass media, particularly physical and emotional symptomatology. It was found that input by professionals, across various forms of media, may have both

positive and negative effects on the manner in which PMDD is perceived, accepted and rejected; both by the public and women who experience it. Negative media portrayal, coupled with negative professional input, may have an adverse effect on women by dissuading them from seeking support and advice from family, friends, and health care practitioners; mainly out of belief that they do not have, or should be able to control, a serious ailment typically framed as non-existent.

Keywords: Premenstrual syndrome (PMS)- Premenstrual dysphoric disorder (PMDD)

87. Goodrich, Jordan; Wagner, Sarah and Shilling, Rebecca

Analysis of Plasma Microparticles in Response to Lung Transplant Injury

Undergraduate - Biological Sciences

Lung transplant success is limited by Primary Graft Dysfunction (PGD). PGD is thought to be a severe manifestation of ischemia-reperfusion injury (IRI). Studies suggest that lung injury is associated with an increase in circulating microparticles (MP) in the blood. We hypothesized that IRI during lung transplantation would increase MP levels and these levels would correlate with the degree of injury in the lungs. We used the newly developed technology available with an image flow cytometer (Amnis Image StreamX). MP were measured in mouse serum from three experimental groups: unmanipulated mice (controls), mice that received an orthotopic lung transplant (OLT) in which the lung was transplanted without an extended ischemia time (OLT-usual), and mice with a severe form of IRI induced by 2 hours warm ischemia (OLT-PGD). We found that MP may increase in both the OLT groups; however the level of MP does not seem to correlate with the degree of injury. The majority of MP were marked with CD62E suggesting endothelial cell origin.

88. Gubareva, Polina; Yotsuya, Mamoru; Hasan, Nageeb; Bertagna, Andrew and Reed, David

Comparing NG2-Type VI Collagen Interactions in the Articular Cartilage of the TMJ and Knee

Undergraduate - Oral Biology

Cell-matrix interactions are critical for regulating cartilage homeostasis, playing an important role in joint health and disease. Despite differences in the composition of the extracellular matrix in TMJ and knee cartilage, the pericellular matrix is similar in both, primarily comprised of type VI collagen. Nerve/glial antigen 2 (NG2) is a transmembrane proteoglycan with a known type VI collagen binding domain. NG2-type VI collagen interactions are well characterized in the TMJ, but poorly defined in the knee. This study seeks to evaluate if surgically induced degeneration of the hyaline cartilage in the knee yields spatiotemporal changes in NG2-type VI collagen interactions similar to those observed in the fibrocartilage of the TMJ. TMJ degenerative joint disease was induced with unilateral partial discectomy. Knee DJD was induced with destabilization of the

medial meniscus. Tissue was collected at 0, 4, 8, 12 and 16 weeks post-operatively, paraffin embedded, and sectioned. Tissue was immunofluorescently labeled with antibodies for NG2 and type VI collagen and imaged using confocal microscopy. In the TMJ, NG2 colocalizes with pericellular type VI collagen in articular, prechondroblastic, and chondroblastic cells. High levels of internalized NG2 are observed in hypertrophic cells. Following the induction of DJD, high levels of internalized NG2 were observed in articular, prechondroblastic, and hypertrophic cells. In the knee, collagen VI has a much more restricted pattern, but is more broadly distributed at the periphery of the joint. NG2 was observed in both articular and hypertrophic cells, with evidence of NG2 internalization in hypertrophic cells. The induction of degeneration yielded elevated type VI collagen surrounding chondral lesions. There were no apparent changes in the spatial distribution of NG2. Both knee and TMJ cartilage express NG2 and type VI collagen. Cartilage degeneration was associated with spatiotemporal changes in pericellular type VI collagen distribution in both cartilages, but the interaction with NG2 could not be determined.

89. Guerrero, Christian; Khan, Shahbaz and Vitosky, Alec

Urban Sound Classification - Identifying Gunshots in an Urban Environment for Faster Response Time Using Neural Networks

Graduate/Professional - Business Analytics

Chicago as of the last few year has had an increase in incidents involving the use of a firearms. This in turn has lead to a surge in the homicide rate that has catapulted Chicago to the national spotlight with negative connotations. The city currently uses the ShotSpotter system from SST, Inc. for identifying gunshots and alerting the authorities of the proximity of shots fired. ShotSpotter captures audio of gunfire and attempts to pinpoint its location.¹ The goal is to respond swiftly to shootings and use neighborhood data to target problem areas. At the moment ShotSpotter covers 13.5 square miles at a cost of about \$940,000 to lease the sensors, plus additional charges for technical support.² That breaks down to approximately \$70,000 per square mile, and there are typically 15 to 20 sensors per square mile.³ The city of Chicago is 234 square miles, granted not all areas are susceptible to firearm incidents, but an expansion of this technology for those that are can aid in localizing the need for police and paramedics. Given the recent advances in low-cost computing systems (RasPi, Odroid-C2, etc..) and audio classification using neural networks, we will explore the possibility of reducing the cost of implementing a system similar to ShotSpotter. The focus of our work will be the classification of urban sounds using the Librosa python library to extract features from wav files, and Tensorflow to aid with classification. Time permitting we will attempt to develop a physical prototype that can automatically listen for and classify sounds.

90. Guidarini, Adam

Translating Pievepelago During the Second World War

Undergraduate - Hispanic and Italian Studies

Over the past year and a half I have been working on translating the book *Pievepelago Durante la Seconda Guerra Mondiale* by Antonio Galli from Italian to English. I am currently working on it as an honors supplement to Italian 300. I have also worked on this translation as an honors supplement for Italian 201 and 301 and have been helped by professors Emanuela Carney and Chiara Fabbian. The book is about the events that took place in the Italian village Pievepelago during the Second World War. The book was written as the diary of Antonio Galli, who was the parish priest of Sant'Andrea Pelago, and recounts the events that took place in Pievepelago and the surrounding area starting in 1943 after the armistice between Italy and the Allies was signed, ending Italy's alliance with Germany. The book ends in 1945 after the surrender of Germany ended the war. The project was originally started by my grandfather who grew up in Pievepelago but he was never able to finish it.

91. Gunawan, Maria

Unwrapping Chicago

Undergraduate – Architecture

Chicago is world-famous for its architectural heritage and history, yet not many books focus in the evolution spaces of production. In this research, I am planning to convey the history and progression of Chicago becoming a great city through architectural drawings. This research's goal is to make a "typological atlas" of development drawings and explanation of the systems works in Chicago. And then re-create, re-imagine part of Chicago of its programmatic aspects, emphasizing the different potentials of the industrial corridors. Most of the data or materials are collected from various book, such as *Nature Metropolis* by Cronon William for understanding the importance of raw resources on shaping Chicago. Not only that, looking at original Sanborn's Map as base mapping of the district. Focusing on commercial buildings and wholesale stores in Chicago which was really important because the late 19th century ladies has just introduced with window shopping. With the newly developed machinery from Industrial Revolution, big department stores start to show in the city, but also the warehouses and production factory of these textile industry. More people able to buy clothes and shoes, instead of custom made in tailors which were slow, long process, pricy and limited. However, Fashion industry in the world have been monopolized with online shopping, which make free lancers designers limited to show and exhibit their work. What I am proposing is a new urban development that combine all the ideas together. A building proposing free lance Fashion Designers to work together and produce variety of merchandise to comply the consumerism in the society. The program of each floor will provide the necessity of the

Fashion Industry, such as manufacturing and production space, retail, studios, events, offices, and private residences.

92. Gurtatta, Rajangad; Teppen, Tara; Zhang, Huaibo and Pandey, Subhash

Regulation of GABA-A receptor gene expression following chronic ethanol exposure and withdrawal

Undergraduate – Psychiatry

The anxiolytic effect of ethanol plays a crucial role in the development and maintenance of alcohol addiction. Changes in gamma amino butyric acid-A (GABA-A) receptor function have been shown during acute and chronic ethanol exposure and its withdrawal within the prefrontal cortex. However, alterations in the mRNA levels of the specific GABA-A receptor subunits and their regulation by histone acetylation during ethanol exposure are less clear. Therefore, we measured expression of various subunits of GABA-A ($\alpha 1$, $\alpha 4$, $\alpha 5$, δ , and $\gamma 2$) using quantitative real-time polymerase chain reaction (RT-PCR). For acute treatments, adult male Sprague-Dawley rats received one injection of 1g/kg alcohol and one hour later brains were collected. For chronic ethanol treatments, rats were maintained on the Leiber-DeCarli chronic ethanol diet for 15 days and withdrawal animals underwent 24 hrs of withdrawal. The control and withdrawal groups were also treated acutely with a histone deacetylase (HDAC) inhibitor, Suberoylanilide hydroxamic acid (SAHA). Brain amygdaloid structures from these rats were collected and total RNA was isolated from prefrontal cortex samples and subsequently underwent RT-PCR in order to measure mRNA levels of GABA-A receptor subunits. It was observed that acute ethanol exposure did not modify the mRNA expression of the $\alpha 1$, $\alpha 4$, $\alpha 5$, or δ subunits of the GABA-A receptor in rat cortex. Interestingly, chronic ethanol exposure lead to an upregulation of mRNA levels of the $\alpha 5$ subunit, which was normalized following 24 of withdrawal. Transcriptional levels of other subunits were not significantly altered by ethanol treatment or withdrawal, and the SAHA treatment during withdrawal did not alter the expression of any subunits of the GABA-A receptors. These results, although preliminary in nature, may suggest an important role for the $\alpha 5$ subunit in the dysregulation of cortical GABA-A receptors in alcoholism (supported by grants from NIH-NIAAA and department of Veterans affairs to SCP).

93. Hamann, Haley; Eichler, Daniel and Papadantonakis, George

Activation Barriers for Methylation of Oligonucleotides Rich in Guanines by Methane Diazonium Ion

Undergraduate – Chemistry

Methane diazonium ions are formed as intermediates from direct-acting methylating agents such as N-alkyl-N'-nitro-N-nitrosoguanidines, alkylnitrosocarbamates, and trialkyltriazenes and from nitrosamines via metabolic activation. The SN2 transition states

of the methylation reaction of guanine with methane diazonium ion were examined in the gas- and aqueous- phases at N7 and O6 sites, employing the B3LYP/6-31+G* density functional method and the SM8 continuum solvation model. The results show that all the methylation reactions are exothermic and the activation barriers in aqueous media are greater than in the gas phase because of steric interference and lower local ionization energies.

94. Hardeman, Sydney

A Visualization Package for the WEVOTE Method

Undergraduate – Bioengineering

The field of metagenomics seeks to understand how the microbes living in and on us affect our health. To do this, researchers must use a series of bioinformatics tools and methods to analyze the microbial sequence reads produced by the Next Generation Sequencing (NGS) technology. WEVOTE (WEighted VOting Taxonomic idEntification) is a recently developed method that achieves the highest precision in classifying the microbial reads and calculating the overall abundance of each bacteria. In order to make the WEVOTE output as intuitive and informative as possible, we have developed a visualization package that summarizes the WEVOTE output. The package is written in R programming language to make use of R's excellent graphing capabilities. Up till now, the package has methods to produce the following graphs: a) a bar chart displaying the number of DNA sequences classified by each of WEVOTE's sub-methods, b) a bar chart showing the confidence score distribution of the classified reads, c) a Venn diagram representing the number of results shared by each pipeline, and d) a phylogenetic tree displaying the taxonomy of the species abundance. This script is a valuable extension to the WEVOTE program. The graphics produced by this script will help researchers by instantly manifesting data in an intuitive form. This saves time and allows researchers to begin interpreting data features specific to their studies.

95. Hasan, Nageeb; Bicknell1, Scott; Yotsuya, Marmoru and Reed, David

Elevated OMI/HtrA2 in Articular Cells During Degenerative Joint Disease in the TMJ

Undergraduate – Spanish

Hypothesis: TMJ DJD promotes elevated cytosolic OMI/HtrA2 in articular cells and OMI/HtrA2 and internalized NG2 colocalization. Objective: Late stage degenerative joint disease (DJD) in the TMJ is associated with pervasive cell death on the articular surface, but the mechanisms controlling this apoptosis have yet to be defined in the context of TMJ DJD pathophysiology. OMI/HtrA2 is an established pro-apoptotic molecule released into the cytosol from the mitochondria during cellular stress, promoting caspase activation mediated apoptosis. This pathway can be inhibited by internalized nerve glial antigen 2

(NG2). High levels of internalized NG2 is found in articular cells of the TMJ during DJD. This study seeks to establish if OMI/HtrA2 is elevated in cytosol of articular cells during TMJ DJD and if NG2 colocalizes with this molecule. Methods: DJD was induced in male c57BL/6 mice using unilateral partial discectomy. OMI/HtrA2 and NG2 were immunofluorescently labeled and imaged using confocal microscopy. Cytosolic levels of each were quantified using the analyze particles plugin in ImageJ, with a thresholding value of 30 and a minimum particle size of 5 (pixel²). Intracellular colocalization of HtRA2 and NG2 was quantified using the WCIF_ImageJ plugin (Toronto Western Research Institute, Canada) and with Duolink Proximity Ligation Assay (Sigma Aldrich). Particle number and colocalization coefficients were statistically compared using t-test two sample assuming unequal variances. Results: Intracellular levels of OMI/HtrA2 were significantly elevated in four week post-operative articular cells (2.1-4.1, p<0.01, df 8), prechondroblastic cells (3.9-12.7, p<0.01, df 6), and chondroblastic cells (6.4-16.2, p=0.011, df 10), but not in hypertrophic cells. Colocalization coefficients between OMI/HtrA2 and internalized NG2 increase in articular chondrocytes 4 weeks post-operative (0.19-0.32, p= 0.011, df 17), and had no change in prechondroblastic or hypertrophic cells. Chondroblastic cells were associated with a decrease in colocalization coefficients (0.19-0.31, p<0.01, df 13). Proximity ligation assay was negative for colocalization. Conclusions: Cytosolic OMI/HtrA2 is elevated in articular cells during TMJ DJD. There is support for OMI/HtrA2 and internalized NG2 colocalization from quantitative imaging analysis but not from proximity ligation. Funding: UIC Department of Oral Biology IRB/ACC protocol: ACC 14-106

96. Hassan, Samer

Herpes Simplex Virus Infection of Porcine Cornea Model is Dependent upon Minimal Viral Titer

Undergraduate - Ophthalmology and Visual Sciences

Herpes Simplex Virus-1 (HSV-1) is a ubiquitous and contagious dsDNA virus known to cause cold sores. The seropositivity of HSV-1 among the population is estimated to be around 90%. HSV-1 has been shown to modulate viral entry using 3-OST-2 heparan sulfate glycoproteins and through such proteins as heparanase and nectin-1. Additionally, the role of optineurin in the viral entry and viral spread to trigeminal ganglion of HSV-1 has been investigated. A quantitative analysis of specific viral titer necessary to cause infection, however has never been conducted. In this capacity, we have utilized 17-GFP HSV-1 infection in porcine cornea model to track viral spread using fluorescence imaging, and to gauge viral infection using imaging, western blots, and qPCR data. Viral titer necessary for infection has found to be between 3 x 10⁶ PFU of infection.

97. He, Kevin; Hou, Isheng; Guo, Brian and Che, Chun-Tao

Phytochemical Analysis of Rosemary

Undergraduate - Biological Sciences

Rosemary [Rosmarinus officinalis L. (Lamiaceae)] is an evergreen shrub. The fresh or dried leaves are used as a spice, and its oil from the flowering tops has been used for perfumery and aromatherapy. Among the chemical compounds present in rosemary, carnosic acid and carnosol are antioxidants that also possess anti-inflammatory and cytotoxic properties against cancer cells. The objective of this study is to analyze the rosemary extract with the aim of understanding its chemical composition.

A rosemary plant extract was first separated by liquid-liquid partition into four fractions based on polarity. Two fractions were followed up by repeated column chromatography, using silica gel as the stationary phase and analyzed by thin-layer chromatograph (TLC) and high-performance liquid chromatography (HPLC). Two semi-purified fractions were obtained during the course of separation and further refined by crystallization. They were designated as Crystals A and B, respectively. When Crystal A was analyzed by LC-MS, it displayed two signal peaks corresponding to compounds having molecular weights of 360 and 330, respectively. These components were subsequently purified by preparative-HPLC. The purified compounds displayed chromatographic (retention times) and spectroscopic (HR-MS, MS-MS, and NMR) properties consistent with those of epirosmanol methyl ether ($C_{21}H_{28}O_5$) and carnosol ($C_{20}H_{26}O_4$). Crystal B was also analyzed by LC-MS. It displayed two signal peaks as well. One of the peaks displayed chromatographic and spectroscopic properties identical with those of carnosol. Structural identification of the other peak is in progress. The isolation procedures and analytical data of the isolates will be presented in this poster, together with a discussion of lessons learned from this research exercise.

98. Hedstrom, Carl

Can Insurance be Incorporated into Micro-Loans to Attract Commercial Banks?

Undergraduate – Finance

Financial inclusion is proven to be one of the greatest drives in fighting poverty across the globe. There are many ways in which financial inclusion can be promoted and different instruments have different results depending on geographical and cultural factors. Even though evidence points in all directions, one instrument tends to be more efficient than others; micro-lending. Microfinance is a blooming industry that has enabled millions of entrepreneurs and business owners to get out of the poverty trap and grow their businesses to levels not imaginable in the absence of micro-lending. Although, commercial banks have yet to engage in these activities, which is surprising to many microfinance pioneers. In this paper, I will dig deeper into the reasons for this phenomenon, and look at features that can make micro-lending more attractive to a wider range of financial institutions. In particular, I will look at different approaches to insure both banks (lenders) and individuals (borrowers) against external risks that may obstruct repayments.

99. Helwink, Diana

At Home, Abroad: Exile, Time, and Memory in Nabokov and Gazdanov

Undergraduate - Slavic and Baltic Languages and Literatures

Vladimir Nabokov and Gaito Gazdanov share many similarities. Both are Russian authors who were born in St. Petersburg, only a few years apart from one another. The authors left for Western Europe in the first waves of emigration out of Russia due to the 1917 Revolution. While not friends, both lived in France and were aware of each other's writing. In their works, "Spring in Fialta" by Nabokov and An Evening with Claire by Gazdanov, they explored life in exile, while fashioning unique approaches to time and memory. Each writer tried to hold on to the identities that were taken from them by the Revolution and to develop distinct interpretations of what it meant to be a writer in exile. Nabokov turned to the English language and embraced life as a writer of "no land, no country." Gazdanov stayed true to his vision of writing in his native language, retaining a sense of connection to the exiled Russian community.

100. Heredia, Maribell and Larson, John

Examining the Effect of Estrogen on Stroke in Female Mice

Undergraduate – Psychiatry

In the United States, strokes are the fifth leading cause of death, 87% being ischemic strokes. Moreover, studies show men have higher incidences of strokes compared to women. Ischemia is due to the blockage of blood flow and deprivation of energy substrates to brain tissue, which can be fatal if an extensive delay in reintroduction of oxygen occurs. Preliminary work in mice models has shown female mice have a later onset of anoxic depolarization (AD) than male mice, as is the case in humans. AD occurs when oxygen deprivation leads to loss of ATP supplies and ion pumps fail, causing uncontrollable neuronal firing and loss of membrane potentials (depolarization). There is reason to believe hormonal differences between male and female mice mediate the gender difference in onset of AD during oxygen deprivation. Electrophysiology will be employed to study CA1 and CA3 regions in the hippocampus in anoxic conditions. The hippocampal slices are normally exposed to 100% oxygen in control conditions. Stroke will be simulated by replacing the oxygen supply with nitrogen until AD occurs. Experiments will be performed at estrogen low and high levels of the female reproductive cycle. If estrogen is implicated with AD, then increasing or decreasing levels of estrogen will cause a respective later or sooner onset of AD. By investigating this potential cause, we can enhance the understanding of stroke and possibly develop prevention and treatments for people who are at high risk of stroke.

101. Herrera, Denisse; Young, Alexandria N.and Burdette, Joanna E.

Phyllanthusmins: A Potential Natural Product Chemotherapeutic for the Treatment of Ovarian Cancer

Undergraduate - Biological Sciences

High-grade serous ovarian cancer (HGSOC) is the most lethal gynecological cancer, responsible for over 22,000 new cases every year and accounting for 70-80% of ovarian cancer deaths.^{1, 4} Though commonly treated with a combination of surgery and platinum-based chemotherapy, many patients often experience relapses and responses to subsequent therapies are generally short-lived.^{13, 14} Natural products - and their derivatives - are alternative sources for chemotherapeutics. Previous research has found phyllanthusmins, a new class of natural product, are similar in structure to the DNA topoisomerase II inhibitor etoposide. Most notably, phyllanthusmins were found to exhibit anti-cancer effects in vivo and in vitro when evaluated in several cancers.³ This project's aim was to study the antitumorigenic effects of a panel of phyllanthusmin analogs against ovarian cancer cell lines, OVCAR3 and OVCAR8, and begin to elucidate their unique mechanisms of action. OVCAR3 and OVCAR8 were treated with three phyllanthusmin analogs (PHY25, PHY30, PHY34) in varying doses for three days. Effect on cell viability was measured using sulforhodamine B (SRB) assays, revealing the most potent analog to be PHY34 with an IC₅₀ of 4.1nM in OVCAR8 and an IC₅₀ of 3.9nM in OVCAR3. PHY34 did not have cytotoxic effects against the normal ovarian surface epithelial (IOSE) cell line. Preliminary results identified a dose-dependent reduction of cell viability. Cell lysates were tested for induction of pro-apoptotic proteins and found an increase in cleaved PARP after 72 hours. Annexin V-FITC/PI staining assays suggest the phyllanthusmin analogs induce apoptosis. Wound healing assays demonstrated that PHY25, PHY30, and PHY34 reduced cell migration. Furthermore, PHY34 inhibited cancer cell growth in vivo in both hollow fiber and intraperitoneal xenografts assays. These findings support phyllanthusmins as valuable leads for potential new therapeutics for ovarian cancer, expanding treatment options for patients with HGSOC.

102. Heshmat, Claire

Fungal and Bacterial Abundance Gradient in Mycorrhizal Associated Forests

Undergraduate - Biological Sciences

It has been established that nearly all temperate forest trees increase accessibility to nutrients by associating with either arbuscular mycorrhizal (AM) or ectomycorrhizal (EM) fungi. However, there is limited understanding of the differences between AM and EM below ground microbial community composition. I have examined the changes in fungal and bacterial abundance in varying percent EM forests. Ninety soil samples from 3 deciduous hardwood forests in Southern Indiana were analyzed for microbial composition using amplicon illumina sequencers. Fungal to bacterial abundance ratios were created by calculating the number of fungal or bacterial DNA sequences isolated from each sample.

The Pearson's correlation coefficient was calculated using R Studio software. My results show a pattern of increasing fungal to bacterial ratios within the below ground microbial community composition with increasing percentage of EM trees. Knowledge of the mycorrhizal association of different tree species may be a useful tool in creating ecosystem models that predict the impacts of shifts in abundance of AM and EM trees that may result from climate change, invasive species, or other factors.

103. Hizel, Michael

Asian and Asian American Women's Beauty Perceptions

Undergraduate – Communications

This was completed as part of an undergraduate coursework for the UIC Honors College Capstone. This research examines what beauty is to Asian and Asian American women. Typically, it is seen that many Asian and Asian American women perceive “western” features as attractive. The first author was trained in qualitative and visual research methods using blogs, videos and scholarly works. First, this research reviews what has happened in the past that affects beauty ideals now, namely the United States’ interventions in Eastern Asia. Interventions such as the Korean War and the Vietnam War, and the far-reaching impact the outcomes of these conflicts have had. From a plastic surgeon making Koreans look more Western, to Vietnamese women being seen as submissive, sexual objects or dead bodies, these wars have created impressions that are still prevalent today. These instances have created the idea that the Asian woman is framed as the “oriental”, or the “other”. As such, many beauty bloggers market products that will improve appearance based on western values. There are also plastic surgeries that Asian women that will endure in Eastern Asian countries that will make them appear more western, which to these women makes them appear more attractive. However, this idea of beauty is beginning to transcend the idea that only western features are beautiful. There is a new popular plastic surgery procedure that shapes the chin into a V-shape that is not found in the western face structure. Also, there are Asian beauty bloggers, such as Michelle Phan who seek to show that typically Asian features are also beautiful and should be something emphasized with cosmetics as well. Due to these efforts, many of these negative stigmas are being erased, however there is a long way to go to undo the damage done by history.

104. Hodgson, Caroline; Patil, Crystal L.; Rivers, Angela and Walsh, Susan

Adolescent and Emerging Adults' Reflections on Group Healthcare for Sickle Cell Disease Transition from Pediatric to Adult Care

Graduate/Professional - Women, Children, and Family Health Sciences

Problem Statement: Sickle cell disease (SCD) is an inherited condition affecting red blood cells and their ability to circulate through the body. In the US, it affects

approximately 100,000 individuals and occurs in 1 out of 365 African American births. Between age 15 and 24, mortality rates more than double. This steep increase in the risk for mortality coincides with a period in which adolescents and emerging adults (AEAs) are in transition from pediatric to adult care; this period of vulnerability requires further investigation and intervention. Purpose: Our Hands, Our Health! was developed by our multidisciplinary team at a large Midwestern urban academic medical center. It is a group healthcare model designed to slowly transition AEAs and assist them with taking ownership over their health. In October 2016, we completed a feasibility study. This presentation focuses on program participants' experiences. Method: Face-to-face interviews were used to capture participant's experiences and reflections on the Our Hands, Our Health! program. Procedure: Each 15-20 minute audio-recorded interview was transcribed into text, coded, and reduced into themes using MAXQDA, a qualitative software program. Results: Several themes emerged from these data. All four participants preferred group healthcare to traditional care. They described the importance of shared experiences. For example, one participant said, "... the main thing that surprised me was when I realized there's other people that have the same problems as me." Participants also reflected on the various activities. Overall, they felt this program contributed to their readiness for transition. Conclusions: This feasibility study showed that group healthcare for transition is a promising model for preparing AEA patients with SCD for adult care. The AEA participants preferred group care. The next steps include a full-scale pilot (March 2017) and a multi-site efficacy study.

105. Howard, Giles

The Analysis of VA/DoD Hypertension Guidelines Compared with AHA and NICE Hypertension Guidelines

Undergraduate – Nursing

This research takes aim at answering the question of what is the difference between the federal health care system VA hypertension guidelines in comparison with the American Heart Association guidelines and the National Institute for Health and Care excellence guidelines. Each set of guidelines were compared and contrasted as well as the patient population that each is intended to serve. Background information on the current issue with hypertension is discussed as well as some current problems with the VA healthcare system. In the comparison, the medications, treatment, and recommendations are analyzed. Information regarding what effects hypertension have on the body is given in order to further show the problem.

106. Huang, Danmei; Madrigal, Jessica M.; Monson, Rebecca S.; Oberholzer, Jose and Danielson, Kirstie K.

Factors Associated with Kidney Function Appear to Differ by Sex in Patients with Type 1 Diabetes Following Islet Cell Transplantation

Undergraduate - Biological Sciences & Statistics

Type 1 diabetes (T1D) is caused by the autoimmune destruction of insulin-producing β -cells in pancreatic islets. Diabetic kidney disease (DKD), characterized by increasing albumin-creatinine ratio (ACR) and decreasing estimated glomerular filtration rate (eGFR), is the primary cause of kidney failure in T1D. Islet cell transplantation functionally cures T1D by replacing β -cells using 1-3 transplants, however its effect on DKD progression is unclear. Therefore, we examined changes in ACR and eGFR, associated clinical and transplant-related factors, and potential sex differences by conducting a secondary data analysis of ≤ 10 years of longitudinal data following islet transplant (multivariable mixed-effects linear regression) from 28 patients in UIC's clinical trials (2004-2015). At first transplant, average age and T1D duration were 46.6 and 28.5 years, respectively, and HbA1c was 7.3%. Median baseline ACR was 7.1 mg/g and mean baseline eGFR was 86.8 mL/min/1.73 m². During follow-up, there was a significant increase in ACR ($\beta=0.06$ per 10 weeks, $p=0.0001$; 242 observations) but no change in eGFR ($\beta=-0.2$ per 10 weeks, $p=0.13$; 1367 observations); these results did not differ by sex (interactions $p>0.07$). Overall, males demonstrated more robust associations with kidney function than females (the following sex differences $p<0.05$): higher ACR and lower eGFR were associated with longer T1D duration; lower eGFR was associated with older age and history of smoking; higher ACR was associated with more islet transplants and more islets transplanted; higher ACR was associated with lower HDL and lower eGFR with not taking statins; and lower eGFR was associated with continued insulin requirement post-transplant. ACR increased in both males and females following islet cell transplant, but was significantly related to the islet transplant procedure in males only. To slow the progression of DKD in males, clinicians should target the identified modifiable factors, and future research needs to identify factors impacting kidney function in females.

107. **Withdrawal**

108. Hughes, Katie

Which Accounting Standard do Businesses Prefer, GAAP or IFRS and Why?

Undergraduate – Accounting

This project is a comparative analysis of the top 5 US GAAP and top 5 IFRS companies in 2015. It shows if there is a correlation between using one or the other and emails from CEOs about why their company would choose one over the other.

109. Hurtado, Ethan

Pedestrian Interaction in Public Space

Undergraduate – Sociology

There has not been much research on the habits pedestrians display while they encounter one another while walking, and how they coordinate their movements to avoid collision with each other. This paper seeks to find the identities of those who stray from their paths to avoid collision with other pedestrians, and also for the identities of those whom maintain their pathway while walking toward other individuals. This study hypothesis that minorities will be more likely to move out of the way for their white counterparts, a notion derived from the concept of the social hierarchy which pertains to gender, race, and class. Through employing the sociological lens of race, gender, and class, where one views their self in the strata of society is dependent on the intersection they occupy. Those whom occupy the higher tier of the social hierarchy will feel more entitlement to space; whereas those of the lower tier may feel less entitlement to space, therefore making room for pedestrians they encounter in public spaces. This study utilizes field note observations on the interactions between civilians in public spaces such as sidewalks, crossing intersections, and shopping malls. Twenty-five sites throughout five neighborhoods from the city of Chicago were used for the observations of this study. Each of the five neighborhoods are distinct in the demographics that occupy the proximity of each set neighborhood and are also diverse in regards to income per capita. After obtaining all field notes, the data was analyzed to find common themes in the identities of the pedestrians, and entered into a qualitative analytic software for analysis to involve word coding to gather statistics for instances of when an individual moved out of the way for another pedestrian and for when they bumped into one another, noting the interactions between individuals in public space.

110. Ibrahim, Usama

Effects of Punitive Segregation on Brain, Social, and Physical Development

Undergraduate - Institute for Policy and Civic Engagement

The present study sought to examine, identify, and characterize the consequences, both positive and negative, incurred by inmates exposed to punitive segregation. Moreover, this research intends to especially shed light on youth punitive segregation and the consequences it has on youth development. The research, a comprehensive review of literature, explored cases of punitive segregation on youth populations incarcerated within the United States. The study was conducted by revising case studies and interviews conducted on individuals who were detained in jail or prison while under age eighteen in Alabama, California, Colorado, Connecticut, Florida, Illinois, Kansas, Louisiana, Michigan, Mississippi, Missouri, Nebraska, Ohio, Pennsylvania, South Carolina, Texas, Utah, Wisconsin, and Virginia. The aspects of development explored are divided into three distinct categories: physiological consequences on the brain, social consequences in future human interactions, and physical consequences. The conclusions reached by examining these aspects of development have overwhelmingly supported the hypothesis that punitive segregation impairs youth development. Furthermore, this form of incarceration bankrupts incarcerated persons from any sensible form of corrections, but

instead emphasizes punishment and deterrence. Consequently, punitive segregation has been deemed internationally as a human rights violation and remains a clear violation of the Eighth Amendment to the U.S. Constitution since it clearly constitutes cruel and unusual punishment.

111. Ignacio, Marienne Elouise

Cervical Cancer in the Philippines: Barriers to Screening and the HPV Vaccine

Undergraduate - Health Systems Science

INTRODUCTION: Cervical cancer is the second leading cause of female cancer cases and deaths in the Philippines, with majority of cases attributed to human papillomavirus (HPV) types 16 and 18. Numerous barriers prevent increases in screening and HPV vaccination rates. Implementation of a comprehensive cervical cancer control program poses substantial challenges for the limited-resource country. **PURPOSE:** The purpose of this literature review is to highlight the barriers to both cervical cancer screening and HPV vaccination in the Philippines and explore areas that require further research. **METHODS:** Using CINAHL and Medline, search terms were combined: “cervical cancer,” “Philippines,” “HPV,” “human papillomavirus,” “HPV vaccine,” “screening,” “barriers,” and “acceptability.” Additionally, the World Health Organization and the Philippine Cancer Society websites were utilized. Google search was used to obtain relevant news articles. **FINDINGS:** Barriers to screening and HPV vaccination include personal expenses and inadequate public health funding; limited access to screening and vaccination services; diverse attitudes and beliefs about cervical cancer screening and the HPV vaccine among parents, recipients, and health care providers; and the political will of the government. A cervical screening program is available, but access is still limited and quality assurance does not exist. The HPV vaccine is currently not included in the country’s National Immunization Program. While there is much literature on the barriers, more research is needed on the necessary actions that will reinforce the implementation of screening and vaccination. **CONCLUSION:** A collaborative effort among the government, the health care providers, and the recipients must take place to promote the success of the cervical cancer control program. All stakeholders must emphasize cervical cancer as one of the country’s public health priorities. Educating the public about the safety and effectiveness of evidence-based interventions such as cervical screening and vaccination against HPV is a crucial step to reducing cervical cancer burden.

112. Illner, Gregorio; Malone, Margaret; Whelan, Christopher and Brown, Joel

The effects of invasive algae on coral cover and coral diversity in Kane'ohe Bay, Hawaii

Undergraduate - Biological Sciences

Coral reefs worldwide are facing critical declines. Patch reefs within Kane'ohe Bay are being threatened by both natural and anthropogenic degradation. Recent bleaching events and invasive Eucheuma and Kappaphycus algae are of local management concern. While invasive algae have recently experienced a population crash, we expect the impacts of competition for space on patch coral reefs to still be seen within Kane'ohe Bay. We hypothesize that reefs with past invasive algae populations will have less coral cover and less diversity than reefs without invasive algae. Two patch reefs with historically high invasive algae density were sampled as "degraded" sites, and 3 reefs without high historic invasive algae were sampled as "high quality" sites during Summer 2016. Photos were taken with a GoPro Hero4 camera at 5-meter intervals across a 10m x 20m grid on the leeward side of each patch reef to quantify coral cover. Images were edited for color correction and to remove fisheye distortion using Photoshop Lightroom. Images were then cropped to standardized scale of 2.4m². Edited images were analyzed using Coral Point Count with Excel extensions (CPCe), which projected 16 stratified random points across the image. Each point was used to determine substrate type, coral species, and note coral health. Preliminary results suggest reefs without a history of invasive algae have higher coral cover and increased diversity. These results will be incorporated into a larger study addressing behavioral responses of coral reef fish to habitat degradation.

113. Ishueva, Camila; Malchow, Robert Paul and Choi, Ji-in

The Role of Extracellular H⁺ in the Processing of Visual Signals

Undergraduate - Biological Sciences

An understanding of the cellular and molecular mechanisms of brain cells and their communication is critical to understanding how we think, experience emotion and perceive the world around us. Glial cells, known as supporting cells in the nervous system, have been shown to regulate the activity of neurons. We are testing the hypothesis that glial cells may regulate neuronal excitability by emitting protons, which makes the extracellular space acidic. This acidification is hypothesized to block calcium channels in the neurons, decreasing calcium-dependent release of neurotransmitter from the neurons. It is further hypothesized that it is extracellular ATP, released by the neurons, that induces the glial cells to release protons to acidify the extracellular environment. The use of proton-selective microelectrodes in a self-referencing method is effective to measure the proton flux from individual glial cells. In this format, a microelectrode with a ~ 2 micron opening that contains a proton-selective resin is first placed about 1 micron from the membrane of a cell and a voltage reading is measured. The electrode is then moved 30 micrometers away to take another voltage recording. Subtracting the two voltage recordings gives a differential signal reading that shows a differential proton concentration. This process eliminates electrical drift and noise inherent in such ion-selective electrodes and increases their useful sensitivity by ~1000 X. Using this method, we were able to measure a standing proton flux from unstimulated glial cells, and observed an increase in acidity upon the addition of extracellular ATP. These data show that (a) self-referencing pH-selective microelectrodes can detect the small proton fluxes expected from individual cells, and that (b) activating glial cells with ATP promotes an

increase in extracellular acidity, consistent with the hypothesis that proton release from glial cells could be involved in regulating the activity of nervous system function.

114. Issa, Yazan; Marshall, Michael S and Bongarzone, Ernesto R.

Mouse Model of Krabbe Disease Includes Alpha Synuclein Accumulations in Spinal Cord and Peripheral Nerves

Undergraduate - Anatomy and Cell Biology

Krabbe's Disease (KD) is a sphingolipidosis caused by a mutation in the gene that codes for the protein Galacosylceramidase (GALC) leading to a toxic buildup of the sphingolipid psychosine. This is characterized by a weakening of the myelin sheath surrounding neurons as well as a loss of neural function in those affected. Recent studies have noted an involvement of neurons in the pathology of KD, with some studies focusing on aggregate plaques within cells. The study performed investigates the presence of cytoplasmic Thioflavin-S plaques within the Twitcher mouse model of Krabbe's disease with a further focus on the spinal cord and the peripheral nervous system (PNS). A quantitative temporal and anatomical study was performed on Thioflavin-S-reactive deposits in different regions of the spine. Thioflavin-S aggregate density increased significantly from early age (7 days post-natal) to mid-stage Krabbes disease (15 days post-natal) with no significant difference appearing afterwards in the ventral region of the spine. In the dorsal region, aggregate density increased at a slower rate, with significant increases happening at each time point 15 days apart. Late stage (45 days post natal) aggregate density showed no significant difference in either region when compared to each other nor in comparisons of the cervical or lumbar regions of the spine. PNS regions such as sciatic and mesentery nerves were not quantized but analyzed through immunofluorescence. Immunofluorescence staining showed most plaques to be located within neurons with a small portion in microglia. Immunofluorescent and Western blot analysis indicate the presence of misfolded and aggregated α -synuclein, a protein commonly found in neuronal tissue, further supporting studies identifying KD as an α -synucleinopathy.

115. Iyer, Sresht; Gordon, Rachel and Crabbe, Rowena

Video Quality and Attractiveness

Undergraduate - Biological Sciences

In this study, we explore how four aspects of video quality may confound rater perceptions of attractiveness: lighting and facial expression, gaze, and angle. The lighting construct encompassed image contrast, shadow, and resolution, while facial gaze, angle, and expression captured eye contact, head positioning, and positivity/negativity of expressions. We examined these issues using a set of 240 "thin slices" (10-second excerpts) from videos taken when 60 children were 6-months old, in 4th and in 5th grade,

and age 15. Thirteen undergraduate students rated questions we developed based on prior literature to operationalize the focal constructs. These students also rated the videotaped children's attractiveness. Each of the 13 raters answered the questions privately; and, ratings were done in four sets to minimize raters directly adjusting their responses about one construct based on another construct. We calculated averages of the 13 ratings to give us a general signal of each quality construct for each video. We then correlated the average quality scores with the average attractiveness scores for the 60 children at each time point in order to examine whether lower quality videos tended to receive lower attractiveness scores. Although our design does not allow us to definitively know whether or not lower ratings were due to a specific quality construct or due to lower true attractiveness, we used the capstone author's own ratings of attractiveness as a template for comparison. This study importantly adds to the literature regarding the degree to which the constructs of lighting and facial expression, gaze and angle affect ratings of individuals' attractiveness, an important topic as more studies use naturalistic recordings to study how looks affect youths' achievement.

116. Izar, Ragda

Oxidation of 2-Aminostyrene Derivatives to Produce 3H-Indoles

Undergraduate - Biological Sciences/Neuroscience

One of the most famous mechanisms for forming indoles is the Fischer synthesis which uses arylhydrazones in the presence of an acid and oftentimes high temperatures (Taber & Tirunahari). This mechanism employs a nucleophilic nitrogen atom and 3,3 sigmatropic rearrangement to form the indole product. 3H-indoles are crucial bioactive compounds that are difficult to isolate from natural sources, and previous research has also provided a mechanism of forming this product from 2-nitroarenes using combinations of Mo(CO)₆ and 10 mol % of palladium acetate (Jana, Zhou & Driver, 2015). However, this reaction is extremely harsh, requires high temperatures, and creates a byproduct. This project examines the optimal conditions needed to generate 3H-indoles from 2-aminostyrene derivatives using a combination of a Lewis acid, oxidant and additive. Initial screening suggests that the combination of PhI(OAc)₂ and Sc(OTf)₃ can transform 2-aminostyrene derivatives to 3H-indoles. After assessing more reagents, a combination of [Bis(trifluoroacetoxy)iodo]benzene (PIFA), Scandium(III) trifluoromethanesulfonate (Sc(OTf)₃), and p-Toluenesulfonic acid (pTsOH) were found as the best conditions to form the 3H-indole using MeCN as the solvent (82% yield). This result is crucial because normally, anilines are oxidized at the arene; however, this result shows the aniline oxidizing at the nitrogen, providing an alternative way of generating C-N bonds in situ via an electrophilic nitrogen. After forming the 3H-indole, the next step was to optimize the reaction by synthesizing substrates with various functional groups and analyzing the 3H-indole yield under the conditions above. Although a few different 2-aminostyrene derivatives resulted in greater 3H-indole yields, more research is needed to assess the full scope of the reaction.

117. Jackson, Kristina

The Long Road to Diversifying Physical Therapy

Graduate/Professional - Kinesiology and Nutrition

BACKGROUND To date, the diversity of rehabilitation professionals (e.g. physical therapy, occupational therapy, speech-language pathology, etc.) does not reflect the increasing diversity of the people they serve. The field of physical therapy is one such area. As of 2010, minority members of the American Physical Therapy Association (APTA) comprised only 2% Hispanic/Latino, 1.4% African-American, and 4.7% Asian. Lack of minority health care providers may hinder minority patients' adherence, participation, and cooperation in rehabilitative programs, thus reducing the effectiveness of therapeutic interventions. By not actively diversifying health care, we are ignoring the populations with the greatest need that health care professionals are sworn to serve. This can indirectly lead to supporting health disparities between underrepresented people and the non-Latino white majority population.

PURPOSE To share the experiences of currently licensed, practicing minority physical therapists with race and discrimination within the application process, their respective DPT programs, and in clinical practice.

METHODS We interviewed ten physical therapists in-person and/or via phone from Illinois, California, Georgia, Pennsylvania, and Arizona. Therapists were African-American, Latino (Hispanic and non-Hispanic), Asian, and African.

RESULTS Experiences differed across various races/ethnicities as they pertained to experiencing discrimination. Individuals with darker skin tones reported experiencing more discrimination than those with lighter skin tones. Individuals with fairer skin or who are perceived to be non-Latino white had a more positive outlook on diversity in the field than individuals with darker skin. Barriers to get into the physical therapy field were the same amongst the different racial/ethnic groups.

CONCLUSION More can be done within physical therapy to develop and produce a more diverse DPT student population. Increasing diversity in the field can help eliminate health disparities, promote conversations about race in the classroom and in the clinic, and provide more opportunities for educating underrepresented students of color.

118. Jackson-Lucas, Ontonio and Aquino, Lizbeth

The Chicago College Experience

Undergraduate – Psychology

Mentorship can be defined as “the guidance provided by a mentor, especially an experienced person in a company or educational institution.” Typically, mentors are assigned in pursuit of professional development, however, the use of mentorship has positive implications for community based work. This study examined the effects of the presence of mentors (professional and natural) on the mental health of college students. This study included n = 50 adults (27 male and 23 female) attending city colleges and universities of Chicago. This study utilized quantitative data collection methods. A 46

question survey was administered to participants via paper and pen, with an average completion time of 10 minutes. The setting in which the survey was administered included campus classrooms, campus housing, and student employment offices exclusively. Data collection was conducted over a 3-week period, from February 20th to March 8th, 2017. Results showed a moderate correlation between the presence of mentors and less symptoms of depression and higher self-esteem within minority emerging adults. With 82% percent of participants identifying as racial minorities, 28% (n= 14) Hispanic or Latino, 30% (n=15) Black or African American, 24% (n=12) Asian, we were able to make an inference on the effects of mentor race/ethnicity and gender having additional benefits on depressive symptoms and self-esteem. While these results may show benefits to having a mentor present in one's life , additional research needs to be conducted on a larger scale to fully support the hypothesis.

119. Jaffery, Syed Akbar; Chen, Chih-Wei and Polikanov, Yury

HPF and Crystal Ribosome Analysis

Undergraduate - Biological Sciences, Molecular Cellular and Developmental Biology

During periods of time when nutrients are scarce, such as stationary phase, bacteria stop protein synthesis and convert their ribosomes into inactive 100S dimers or 70S monomers. Preserving cellular ribosomes this way increases the cell's ability to survive in unideal conditions by preventing the degradation of unused ribosomes. In E.coli, the 100S dimers are formed by binding hibernation promoting factor (HPF) and ribosome modulation factor (RMF) to the cellular 70S ribosomes. Previously, structures of the E. coli HPF and RMF proteins were determined in complex with the bacterial ribosome. My current research in Dr. Polikanov's lab under Mr. Chen's supervision is focused on isolation and purification of alternative versions of HPF protein, termed long HPF. The main goal of the project is to obtain a crystal structure of the bacterial 70S ribosome in complex with the long HPF protein from one of the pathogenic bacterial species. The first step in the project is to isolate and purify HPF protein for the subsequent crystallographic studies. To this end, a host strain was grown at 37°C in an ampicillin containing LB broth. The LB media was inoculated with starter culture followed by adding isopropyl- β -D-1-thiogalactopyranoside (IPTG). The host strain cells were then harvested by centrifugation and frozen in liquid nitrogen. Later, frozen cells were resuspended in a buffer X and lysed using microfluidizer. Next, the obtained lysate was cleared by centrifugation. Finally, the HPF protein was purified from the lysate by Ni-affinity chromatography. The purity of the final protein preparation was assessed using PAGE electrophoresis. Currently, crystallization trials with the new HPF protein are underway.

120. Jara, Stephanie; Knowles, Katherine; Prabhu, Ramya and Marchese, Enza

Effect of Preservation Solutions and Cold Ischemia Time on Islet Isolations

Undergraduate – Neuroscience

Type 1 Diabetes is characterized by severe insulin insufficiency and lack of circulating endogenous insulin, required for normal glucose metabolism, due to selective autoimmune destruction of the pancreatic β-cells, the cells responsible of producing insulin (Piper et al., 2004). The most common treatment for this condition is exogenous insulin administration. This treatment approach however, encounters obstacles given that many factors can influence the method's ability to achieve glycemic control. Islet transplantation was developed as a treatment alternative for type 1 diabetics by releasing insulin in response to physiologic glucose concentration, normalizing glucose levels and eliminating the need for exogenous insulin. The gold standard method for islet isolation is the Edmonton protocol, which uses proteins and density gradients to extract the islets from the pancreatic tissue. After extraction, the islets are purified in the COBE2991 machine which will remove any remaining acinar tissue. Since donor pancreata come from post-mortem donors, different solutions have been developed to emulate normal body conditions and reduce the effects of cold ischemia on the organ as much as possible. These solutions have different compositions which can affect the functionality and the number of islets extracted from each donor. On occasion, there is a high volume of islets extracted and the COBE2991 machine cannot handle all the pre-purification volume at once thus this volume is split into batches which are purified one at a time increasing the cold ischemia time of the islets. The purpose of this experiment was to find the effect preservation solutions as well as the cold ischemia time have on the islet morphology and functionality. Data analysis is still in progress so no results can be presented at this moment.

121. Jennison, Laura

Health Beliefs and Behaviors of UIC Undergraduate Students

Undergraduate - Kinesiology and Nutrition

Background: College is a young adult's introduction to an independent life. Students attending college have increased levels of stress compared to previous times in their lives, less time to commit to their health, and limited knowledge on what they should be doing for their own health. Other studies have shown that "It has been suggested that the highest rate of decline in physical activity occurs in late adolescence and early adulthood in those age 18 to 24 years." (Grubbs, 2002) Transitions into adulthood change the priorities of a person. The individual's perceived health, and knowledge of healthy habits impact each's ability to control their health. Stress, time management, knowledge and other factors may be affecting student's ability to maintain a healthy lifestyle. The importance of this time period is that these habits are the first individualistic habits developed by the students. The development and maintenance of a healthy lifestyle at this age may help these students continue the habit throughout their life, and the development of poor habits may also continue to impact the students throughout their life. Objective: To evaluate the possibility of a relationship between UIC undergraduate students' beliefs about health overall, their own health and their current health behaviors. Methodology: A new survey

was developed to determine the health beliefs and behaviors of UIC undergraduate students. This survey was then delivered to students by emailing a link to students. All participants were provided with a written informed consent. 52 students responded to this survey and the data was analyzed to determine the relationships that were present between their responses.

122. Jimenez, Andrea

Cybersecurity and Fraud in a Digital Era: the impact of a digital society on computer fraud

Undergraduate – Accounting

The Association of Certified Fraud Examiners estimates that businesses lose approximately 5% of earnings to fraud every year. This translates to trillions of dollars for the economy. Because fraudulent acts can vary immensely in ways that they can be perpetrated, there is no single definition for fraud. What is agreed upon, however, is that fraudulent acts are committed with an intent to deceive and gain an unfair advantage over another individual or business. Fraud perpetrators are no different than the general public, and it is hard to predict who will commit fraud, but it is likely for a person to commit fraud if the following elements are present: an opportunity, a perceived pressure, and a rationalization. Moreover, in 2000 the US Federal Bureau of Investigation (FBI) created the Internet Crime Complaint Center (IC3) to provide a line of communication for the public to report computer crime. The IC3 tracks these filings and releases annual reports detailing the year's reported fraud cases and the related losses. Over the past years, these reports and losses have varied in type and size, and are projected to increase. This is where our shift, as a society, to greater use and reliance on Internet, computer and mobile technologies could potentially contribute to fraudulent activities. A digital society leads to higher cybersecurity risks because there is more opportunity created for potential perpetrators to commit fraudulent acts, specifically those directly accomplished through use of computer technologies. As such, this study compiles data relating to digital technology and Internet usage as well as the IC3 annual reports to analyze and determine the impact that our digital society has on the prevalence and magnitude of computer fraud, specifically. We conclude the study with an explanation of the implications and preventive measures we can take to safeguard online activity.

123. Jimenez, Med and Morrison, Donald

Mixed High Cell Density Gene Transfers in an Artificial Biofilm of *Streptococcus pneumoniae*

Undergraduate - Biological Sciences

A predatory mechanism involving cell to cell attack in *Streptococcus pneumoniae* increases the rate of gene transfers between cells by one thousand-fold. Depending on the

biological and epidemiological contexts, gene transfers within biofilms in human hosts can involve macro recombination events which are uptakes of multiple long stretches of DNA from another cell. Biofilms can form in vitro, but this takes days of culture incubation. To study more closely the gene transfer between closely packed cells, on a much shorter time scale, we developed an artificial biofilm model of approximately 9 cm² containing 10-20 cfu/μl. At this high density, cells could be induced to attack neighboring cells and take up their DNA by infiltration of competence stimulating peptide. Up to 1% of induced cells in the population acquired DNA from neighboring cells within two hours in the new artificial biofilm model. The rate of gene transfer depended on various conditions (aeration, temperature, time during competence, and growth media), and was optimized for maximal yields of transformants. An anoxic environment did not affect the transformation rates during competence period. Transformant yields were the highest between 34°C and 37°C, and required the presence of competence stimulating peptide. Kinetic studies showed that DNA uptake began 20 minutes after infiltration of the competence peptide pheromone, and was largely completed by 60 minutes. Funded by The UIC College of Liberal Arts and Sciences Undergraduate Research Initiative.

124. Jin, Vivian; Dean, Matthew and Burdette, Joanna E.

Fallopian Tube Epithelium Remodels Ovarian Stroma in High-Grade Serous Ovarian Cancer Through Loss of PTEN

Undergraduate - Medicinal Chemistry & Pharmacognosy

High-grade serous ovarian carcinoma (HGSOC), the most lethal gynecological cancer, can originate from the fallopian tube epithelium (FTE). Our lab demonstrated that the ovary is critical in colonization and increases aggressiveness of the disease. We hypothesized that normal FTE must first be transformed before growing in the collagen-rich ovarian stroma. To test this, we cultured normal cell lines (MOE, MOSE, IOSE80) and HGSOC cell lines (OVCAR3, OVCAR4, OVCAR5, and OVSAHO) on two-dimensional (2D) and three-dimensional (3D) type I collagen. While 3D collagen had no effect on the viability of HGSOC cells lines, 3D type 1 collagen decreased viability of normal cells relative to 2D collagen. We tested a panel of murine oviduct epithelial (MOE) cells mutated to mimic alterations commonly observed in HGSOC, including mutant p53 (p53R27H and p53R248W), loss of PTEN (PTENshRNA), amplification of KRAS (KRASG12V), and PTENshRNA + KRASG12V. Expression of p53R27H or p53R248W did not improve viability of MOE cells. KRASG12V tended to increase viability ($p < 0.1$), but was not significant. In contrast, PTENshRNA and PTENshRNA + KRASG12V completely rescued MOE cell viability. Adhesion assays were performed to further characterize effects of PTEN loss and KRAS amplification. We discovered both cell lines attached to 3D collagen at the same rate as controls, but KRASG12V and PTENshRNA more aggressively invaded through 3D collagen. In spheroid formation assays, PTEN cells formed compact cellular spheres (spheroids), while control MOE cells did not. These results demonstrated that loss of PTEN enhances survival of ovarian cancer cells on 3D type 1 collagen, which may control the ability of HGSOC to adhere to the ovarian extracellular matrix exposed during ovulation. This investigation holds clinical

importance in contributing to the development of a therapeutic target for women at risk of HGSOC by reducing ovary colonization and inhibiting the aggressive nature of the disease.

125. Joniak, Ronald and Ugalde, Claudio

Neutron Star Mergers and the R-process

Undergraduate – Physics

About half of the elements of the periodic table that are present today in the Solar System were synthesized before the formation of the Sun via a rapid neutron capture process (r process). However, the astrophysical site of the r process is a longstanding problem that has captivated both experimental and theoretical astrophysicists. Up to date, two possible scenarios for the site of the r process have been suggested: the first involves the high entropy wind of core collapse supernovae, and the second corresponds to the merger of two compact stellar objects such as neutron stars or a neutron star-black hole pair. In this work, we will study the robustness of the nucleosynthesis abundance pattern between the second and third r process peaks as produced by neutron star mergers with r process-like neutron exposures. We will do this through the Truran r -process code[1] coupled with density and temperature trajectories obtained from hydrodynamical calculations from Rosswog et al. 2013[2]. First, we will vary parameters to obtain an understanding of the astrophysical mechanisms that create the r process. Next, we will create a program to obtain the best possible parameters based on a chi-squared test. Once we have the best fits, we will test the effect of fission in the overall isotope abundance pattern distribution. Later on, we will vary the ratio of masses of the two fission fragments and study its effect on elemental abundances. One last parameter to vary will be the ratio of the masses of neutron star pairs. Ultimately, we hope to gain an understanding of the astrophysical origin of the r process. [1] Truran et al., ApJ 222, L63(1978). [2] Rosswog, S., Piran, T., & Nakar, E., MNRAS, 430, 2585 (2013).

126. Kaczmarczyk, Laura

Personal Agency Through Music Choice

Undergraduate – Psychology

Music is common in industrial and organizational settings, and could impact work performance. Employee control (i.e. agency) in music selection has not been investigated, and could moderate the impact on performance. To examine the effects of agency in music order in a mock organizational setting, thirty participants were recruited from the Psychology Student Subject Pool, and randomly divided into two groups. The study was conducted to test whether the students who had control over the order of music they listened to would complete a brief task more quickly and effectively than those who did not get the choice. In this experiment, both groups listened to the same set of five songs,

where the “choice” group was able to set the order of the songs. All songs had been controlled for length. The participants also filled out a survey regarding their experience in industrial or commercial settings, as well as their response to the experiment. It was the aims of this research to help illustrate the impact of personal agency on workplace performance, which may have significant benefits on well-being and productivity for workers. Furthermore, any benefit to agency could be of limited cost for companies and employers. Keywords: agency, music choice, well-being, mattering, environmental aspects.

127. Kamal, Aneeka and Nasr, Ahmed

A Scientific Inquiry into the Predatory Nature of Birds and their Effect on Soybean Crop

Undergraduate - Biological Sciences

Birds have been shown to provide pest control services in both natural and agricultural ecosystems. The purpose of this study was to examine the potential for native Illinois prairie birds to provide insect pest control in soy bean fields adjacent to Nachusa grasslands (The Nature Conservancy). Scientific inquiries into the birds present within these grasslands and their dietary preferences were also determined. The various species of insects consumed by the aforementioned birds, and their respective lifecycles were also observed. The hypothesis for this study was as follows: soy bean plants grown within bird exclosure cages would experience greater pest damage than control plants grown with no exclosure cages around them. Therefore, fruits harvested from plants grown within cages would be smaller and weigh less than fruits harvested without exclosure cages. Methods which were utilized to test the aforementioned hypotheses included the following procedures: soy seed pods harvested from plants within the exclosure cages and the control plants were oven-dried at 55°C, for one week, until a constant weight was achieved. Statistical tests including Student’s t-tests were conducted on the mean weights of seed pods from plants within exclosure cages and the control plants. T-tests were also conducted on the mean number and mean weights of soy bean seeds from plants within the exclosure cages and control plants. Results from the statistical analysis indicated that plants from the exclosure cages weighed more than the control plants, and had a higher variance. The aforementioned findings indicate that there are other natural pesticides at work, alongside birds that influence crop production.

128. Kambalyal, Anuj; Sobkiv, Sophia; Perkins, Guy and Lysakowski, Anna

Energy Output Characteristics of Efferent Bouton Mitochondria of the Inner Ear

Undergraduate - Anatomy and Microbiology

Mitochondria produce ATP to power many functions in cells throughout the body. The current depiction of a mitochondrion, containing an inner membrane (IM), outer

membrane and cristae that increase the surface area of the IM, has been the universally accepted model for decades. Although the basic function and structure of mitochondria have been studied for many years, recent analyses based upon data gathered from electron microscopy (EM) has led to further investigations of mitochondria (Rabl et al., 2009; Zick et al., 2009). We have been using IMOD software (Univ. of Colorado, Boulder) to reconstruct mitochondria located near different high energy-demanding intracellular components and have obtained new quantitative data. In efferent boutons coming from the brainstem to contact vestibular calyx endings in the inner ear, we have observed tubular crista morphology, thought to be a lower-energy form of mitochondria compared to the lamellar morphology found in most neurons. We have used the values obtained for total crista surface area in our 3D reconstructions to calculate both the rate of ATP production (Song et al., 2013) and the amount of energy produced by this type of mitochondrion. Our values are 250-350 zeptomoles of ATP/sec and 8-10 femtojoules of energy, compared to roughly 1000 zeptomoles of ATP/sec and 25-50 femtojoules of energy for more typical lamellar cristae. Thus, we can confirm that tubular cristae in efferent boutons contacting vestibular calyx endings in the inner ear do indeed produce less ATP and less energy. The implications of this level of ATP production or energy output on hair cell or afferent function are unknown at this time, but will be the subject of future research.

129. Kang, Jennifer; Koniewicz, Kristen L. and Jones, Alesia

Depression and Help-Seeking Behavior: Examining Student Status and Training Site

Graduate/Professional - Family and Community Medicine

300-400 doctors commit suicide annually. Alarmingly, medical students have a higher incidence of suicidal ideation than physicians but are less likely to seek treatment, with previous studies indicating only 20% of those with depressive symptoms seek professional care. This indicates a need to further explore patterns of depression during medical school. This study seeks to examine the relationship between training site, year of study, depression, and help-seeking behavior. Medical students at the University of Illinois at Rockford, Peoria, and Urbana campuses were invited to participate in an anonymous online survey eliciting questions regarding demographics, help-seeking behavior, and depression based on the PHQ-9. A total of 259 students completed the questionnaire over a six-month period. Descriptive and Chi-square analyses, and a series of univariate analyses were conducted on study variables with a significance level of 0.05. In contrast to previous studies indicating high rates of depression among medical students, our study found that students reported mild depression with a mean PHQ-9 score of 5.5. There was variation in depression scores based on training site and year of study; however, univariate analyses found no significant difference in depression scores by campus. Significant differences were found by year of study ($p=.00$), with second-year students receiving the highest mean depression score (7.78). Consistent with previous studies, findings also suggest differences in help-seeking by depression severity. Students with higher depression scores were less likely to seek support than those with lower scores. This suggests a need for programs to identify students at risk for depression and more targeted efforts to address medical student mental health. Medical schools should

consider students' year of training and year-specific stressors in developing programs to improve student wellness.

130. Katzman, Sandra

Age of Acquisition and Language Use Impact on AJTs

Undergraduate - Hispanic and Italian Studies

Code-switching (CS) is the alternation between two languages in a single conversation. Currently, research in experimental syntax using CS lacks a standard methodology with respect to different aspects, one of them being participant selection. Usage of CS in daily speech, as well as the age of onset of bilingualism, may or may not affect the subjects' acceptance of specific code-switched structures. Therefore, it is crucial to identify whether or not these variables need to be controlled in future experiments. My research focuses primarily on these two aspects of participant selection. More specifically, I investigate whether these aspects have an effect on the subjects' acceptability ratings of specific code-switched structures through Acceptability Judgment Tasks (AJTs). My research question is: does usage of CS and/or age of bilingualism, as reported by subjects, influence their acceptability of specific code-switched structures? In this particular case, since there is no previous research, I adopt the default hypothesis: Usage of CS and/or age of bilingualism will not influence acceptability of specific CS structures. Ninety-five students of the University of Illinois at Chicago (UIC) were asked to judge the acceptability of sixty-eight codeswitched utterances via a Google Docs and a Qualtrics survey. The statistical analysis confirms the default hypothesis. However, the pool of participants that reported not using code-switched utterances in daily speech is too small to provide a definite conclusion and further research is needed.

131. Kennedy, Christian; Baynard, Tracy and Griffith, Garrett

Relationships Between Anxiety Mobility and Physical Activity in Individuals with Multiple Sclerosis

Undergraduate - Kinesiology and Nutrition

Multiple sclerosis (MS) is the most common neurodegenerative disease. Through the course of MS, individuals suffer from a variety of symptoms affecting their physical capabilities, such as anxiety. Anxiety has been shown to be ameliorated through increased physical activity (PA) in healthy populations. PA interventions have shown some promising results on anxiety, but they have not been sustainable interventions, such as a home-based program. Objectives: To examine how a home-based intervention influenced the relationships between 1) the change in anxiety and change in mobility, whether measured or perceived, and 2) change in anxiety and changes in physical activity (measured or perceived). Methods: Using a randomized sample, 58 individuals (46 ± 12 yrs; 81.1 ± 19.5 kg/m²) were placed in a stretching or exercise group. Anxiety was

assessed via the Hospital Anxiety and Depression Scale (HADS). Perceived mobility was measured via the Multiple Sclerosis Walking Scale (MSWS), and measured mobility was ascertained from the 25 ft. walking speed. Perceived PA was measured via the Paffenbarger Physical Activity Questionnaire (PPAQ), and measured PA was determined from accelerometry data. All data was collected pre and post intervention. Results: The pre-intervention variables were not different between groups nor did anxiety change pre or post intervention. Further, anxiety was not strongly correlated with any of the mobility or PA variables pre or post intervention. However, the exercise group demonstrated a positive correlation in anxiety and changes in average step count ($p<0.05$). Conclusion: Our home-based intervention did not appear to alter anxiety in our cohort, but it appears to be related to changes in measured PA for the exercise group. This suggests exercise may mediate changes in leisure time physical activity through anxiety changes, despite the lack intervention effects on anxiety as a group.

132. Kerdjoudj, Mourad

HDAC inhibitor TSA selectively inhibits the expression of genes implicated in experimental autoimmune encephalomyelitis

Undergraduate – Chemistry

Multiple sclerosis (MS) is a demyelinating disease of the central nervous system caused by the T lymphocytes recognizing myelin antigens. Current therapies exert nonspecific suppressive effects and do not target the T cells to provide protection without severe side effects. Our laboratory has recently demonstrated that the administration of mice with the histone deacetylase inhibitor Trichostatin A (TSA) can reduce the severity of an MS-like disease, experimental autoimmune encephalomyelitis (EAE). The protection given by TSA administration was due to induction of T cell tolerance. To assess the effects of TSA on T lymphocytes, lymphoid cells were derived from mice immunized with the myelin oligodendrocyte glycoprotein (MOG)35-55 peptide and treated with or without TSA. The cells were then cultured with immunizing antigen and recombinant IL-12 in vitro. To characterize the changes in gene expression by TSA treatment, total RNA derived from these cells was converted to cDNA and probed for the expression of various genes using qRT-PCR. The results indicated that activation of the T cell line derived from untreated mice resulted in substantial increases in the levels of mRNA specific for IFN- \square as well as IL-17, IL-22 and GM-CSF, while decreased levels of expression for these genes were observed in TSA treated mice. The transcription of another cytokine implicated in EAE manifestation, iNOS was not modulated by TSA treatment. Whereas the transcription factor Tbet required for IFN- \square transcription was not upregulated in control cells and modulated by TSA treatment, the induction of Rorgt implicated in IL-17 transcription remained unchanged by drug treatment. The transcription of the chemokine CCL2 and its cognate receptor CCR2 was enhanced in control T cells in response to activation and TSA treatment diminished their expression. Collectively, these results reveal that TSA treatment selectively inhibits the transcription of genes that may impact the pathogenesis of neurodegenerative disease.

133. Khalid, Syeda; Cordoba-Chacon, Jose; Banerjee, Ronadip and Kineman, Rhonda

Antagonizing Role of PRLR-2 in Growth Hormone Receptor Signaling in Hepatocytes, in Mice

Undergraduate - Biological Sciences

Secreted by the anterior pituitary gland, Prolactin is a hormone involved in many biological processes including lactation and reproduction¹. The functions of prolactin are facilitated by its transmembrane receptor, PRLR. In the mouse liver, the long isoform of PRLR (PRLR1; capable of activating STAT5) is naturally expressed at very low levels, while the short isoforms (PRLR2>PRLR3; STAT5 inactive) are dominantly expressed, with higher levels in female livers that increase with pregnancy². Although the signaling pathway of the long isoform is very well recognized, the functions of prolactin that are mediated by the short isoform of PRLR are not well known¹. It has been reported that hepatic prolactin signaling regulates glucose homeostasis in male mice by a STAT5-mediated promotion of hepatic insulin signaling. However, in the mouse liver the long isoform of PRLR (PRLR1; capable of activating STAT5) is naturally expressed at very low levels, while the short isoforms (PRLR2>PRLR3; STAT5 inactive) are dominantly expressed, with higher levels in female livers that increase with pregnancy. Therefore, in this study we sought to confirm and extend the previous findings by examining the impact of adult-onset, hepatocyte-specific knockdown of the endogenous PRLR (aHepPRLRkd) on circulating glucose levels in male and female mice. Specifically, aHepPRLRkd was induced by treating 9-12 week-old PRLRfl/fl mice³ with an adeno-associated viral vector expressing a thyroxine binding globulin promoter driven Cre recombinase (AAV8-TBGp-Cre). PRLRfl/fl mice treated with AAV8-TBGp-Null served as controls. AAV8-TBGp-Cre led to a >90% reduction in PRLR2 and PRLR3 mRNA levels in both male and female livers, with minimal impact on the expression of PRLR1. The effect of aHepPRLRkd on circulating metabolites, body and liver weight, and on the expression of Growth Hormone regulated genes was assessed and these initial results suggest that the hepatocyte PRLR is unlikely to play a direct role in mediating glucose homeostasis, however it may have an antagonizing effect on GH signaling.

134. Khan, Faisal

Effects of Divorce: A Literature Review

Undergraduate - Criminology, Law, and Justice

For many children, experiencing divorce can be a traumatic, difficult and disruptive event. The occurrence of divorce can leave lasting effects on those involved. A child's developmental stage may be a factor in how divorce is experienced and perceived. This project involved a review of the literature to examine and compare the age and developmental stage a child experiences divorce with their future relationships with

intimate partners. The literature used in this project was found by developing a keyword search strategy and searching myriad of academic databases through the University of Illinois at Chicago.

135. Khokhar, Suhail

Facilitation of General Anesthesia Emergence in Rats

Graduate/Professional - Anesthesia and Critical Care

Background: General anesthetics induce a coma-like state; recovery from anesthesia is passive and is due to the discontinuation of anesthetics. In our previous study, three drugs that elevate [cAMP]_i levels were found to dramatically accelerate the emergence from anesthesia in rats. The most effective drug tested was caffeine which dramatically accelerated recovery from anesthesia (isoflurane and propofol) at relatively modest concentrations. In addition to elevating [cAMP]_i, caffeine also inhibits adenosine receptors. A_{2A} receptors mediate caffeine's arousal effects since knocking out this receptor or blocking it pharmacologically suppresses caffeine mediated arousal. It is possible that elevation of cAMP level and/or inhibition adenosine receptors play important roles in reversing anesthesia. In this study, we tested preladenant (a selective A_{2A} receptor antagonist), forskolin (a drug elevates intracellular cAMP without interacting with adenosine receptors) and preladenant with forskolin to determine their effects in facilitating in the emergence of isoflurane-induced general anesthesia in rats. Furthermore, a high concentration of isoflurane (3%) was tested in these studies in order to determine whether caffeine or preladenant/ forskolin could reverse the effects of anesthesia regardless of the concentration of the anesthetic. Conclusions: Preladenant, facilitated the emergence of isoflurane general anesthesia. Forskolin,, also reduced the recovery time of general anesthesia in these rats. Administrated together, preladenant and forskolin further reduced the awaking time in these rats than either drug was given alone. The reduction in waking time was similar to that produced by caffeine (75 mg/kg), suggesting that the combination of preladenant and forskolin could mimic the effects of caffeine. These results suggest that both elevation of cAMP and inhibition of adenosine receptors play significant roles in accelerating the recovery from anesthesia. Further studies are needed to find the ideal doses and timing of both drugs for the optimal effects in term of recovery time and safety.

136. Kim, Joan

Measuring the Effectiveness of Various RFP Antibodies

Undergraduate - Biological Sciences

Intracellular trafficking is the shuttling of proteins and membranes within a cell and is necessary for all cells to function properly. Defects within intracellular trafficking may result in conditions including cancer, diabetes, and Alzheimer's disease. Therefore, it is

important to understand how this process is regulated. *S. cerevisiae*, or yeast, is used as a model organism because many cellular functions are conserved from yeast to humans and is a relatively simple system. My work involves molecular switches called Ypt/Rab GTPases (in yeast and humans respectively) which are key regulators of different protein transport steps, and the guanine-nucleotide exchange factors (GEFs) that regulate the GTPases by activating and deactivating them. Special interest is shown to the TRAPP I, II, and III complexes which are GEFs acting in different stages of protein trafficking. To further explore the role of TRAPP complexes, it is necessary to observe and measure the expression of TRAPP proteins by attaching fluorescent labels, or tags. Although there are many different fluorescent tags available, many of them do not provide bright signals when viewed with fluorescent microscopy due to reasons including misfolding and unwanted clustering of the large TRAPP proteins. Thus, the objective of this study was to determine which red fluorescent protein (RFP) tag will be most effective for visualizing TRAPP proteins. Various commercial RFP tags were obtained and were tagged onto subunits in the TRAPP complex. Protein expression was determined by Western blotting and was verified by using G6PDH as a marker. Three out of the 5 tags that were used showed strong expression whereas 2 did not show any results at all. This finding suggests that researchers who study the TRAPP complex should generally avoid using certain RFP antibodies that are available commercially.

137. Knowles, Rachel

The Co-Influential Relationship Between College Students' Academic & Social Media Writing

Undergraduate – English

Until recently, academic and social media writing has been widely considered in separation; however, it is becoming increasingly clear that these distinct typologies do indeed converge in some respects. This project takes the form of an exploratory investigation into this relationship and the extent in which these two typologies co-influence each other. For this project, the researcher conducted interviews of current UIC students on their attitudes, experiences, and observations concerning writing academically and recreationally. Samples of students' academic and social media writing were analyzed for patterns of similarity and/or contrast, and a deeper investigation of their individual writing styles, influences, and techniques was undertaken. Results reveal three primary points of analysis, summarized categorically as 1) the definition of writing, 2) identity, and 3) "multi-modal" meaning making. Students in this study seem to agree that the quality of their academic writing, described as "formulaic," "robotic," and "constrained," is dictated primarily through their professors, whose evaluations can vary greatly due to the qualitative nature of writing. Interestingly, social media was largely ignored by students in conversations about writing, suggesting that students do not easily understand writing as occurring outside the realm of academics. The study also concludes that students' attitudes, life experiences, and observations are often woven in some way in every piece of writing they create, even when limitations are present. Finally, student writers demonstrated the ways they navigate and create meaning using the tools available

to them on any given medium, showing how these techniques can translate similarly across to other types of writing. The researcher concludes that there does indeed seem to be a significant co-influential relationship between college students' academic and social media writing, but such relationships warrant a deeper inquiry into understanding each of the above three concepts, with special consideration to how they operate and why.

138. Kolachina, Shilpa; Pierce, Emily; Dutton, Rachel and Sanchez, Laura

Uncovering Biomolecular Interactions on Cheese Rinds: Pseudomonas vs. Candida

Undergraduate – Bioengineering

Although diet composition is a commonly studied topic in the scientific community, little is known about the microbial chemistry on the fermented foods we eat. Recent studies suggest that certain food-associated microbes alter the human gut microbiome composition. While the gut microbiome has been extensively studied and linked to various health implications, this may indicate that further knowledge of the microbial composition of commonly ingested foods can prove useful in understanding human health. Cheese rinds, edible biofilms, are effective food microbiome models because the microbes and community trends are lab tractable. Here we investigate a natural rind microbial pair - Pseudomonas and Candida, and the underlying mechanism(s) behind the positive growth of the bacteria in response to the yeast. We employed MALDI-TOF imaging mass spectrometry (IMS) to test the hypothesis that Pseudomonas excretes an antifungal metabolite in response to Candida. Large scale culturing (1L) and extractions were performed followed by subsequent bioactivity testing and mass guided isolation of the metabolite. Bioactivity testing was accomplished by testing fractions of the Pseudomonas extract obtained through RP chromatography. Analysis of the IMS runs on Bruker flexImaging produced specific spatial distributions of interest at m/z 570, 571, and 589. These distributions depicted a strong excretion gradient beginning near the Pseudomonas lawn and spreading out around the edges of the Candida line, almost exactly where Candida was strongly inhibited. A bioactivity test was performed with the pre-fractions mentioned above, and a zone of inhibition on the Candida lawn was visible in the 80% MeOH pre-fraction. Analysis is ongoing, with HPLC, 2D NMR, and MS/MS analyses to be performed to elucidate the structures of these Psuedomonas antifungal compounds. Upon completion, this project will expand our knowledge of the chemical interplay between commonly ingested food microbiome members using mass spectrometry techniques.

139. Konduru, Abhinaya

What Type of People Loan Money Without Any Returns? Evidence from Kiva.org

Undergraduate – Finance

Internet based microfinance platforms give philanthropic opportunities for people to help towards causes that they believe in. In this paper, using data from www.kiva.org, non-profit microfinance platform that facilitates cash transfers from individual donors to recipients, I examine the motivation behind the lenders and which occupation lenders are most likely to give money on the platform. I find that lenders who are well off in their industry and are earning a steady income are most likely to be present on the site because they believe the loan will help.

140. Koniewicz, Kristen and Jones, Alesia O.

Medical Students' Mental Health and Help-Seeking Behavior: The Role of Gender and Parental Influence

Graduate/Professional – Medicine

Background, Approximately 400 U.S. physicians take their lives each year. The rate of suicide is four times higher in female physicians than females in other professions. Understanding mental health and help-seeking behavior during medical training is imperative to prevent such tragedies. While studies indicate high rates of depression among medical students, little is known about support utilized when help-seeking. Purpose, The purpose of the current study is to investigate gender differences in medical students' mental health (i.e., depression), willingness to seek support, and sources of support. Methods, First through fourth year medical students enrolled at two campuses of UICOM were invited to participate in the study. Questions eliciting demographics, help-seeking, and depression based on the PHQ-9 were provided using Qualtrics. The response rate was 53% with equal male and female participation. Descriptive analyses were conducted, and Chi Square analysis was performed with a significance level set at 0.05. Results The mean score for the PHQ-9 was 5.36, suggesting mild depression experienced by medical students. There was no statistical difference in prevalence or severity of depression by gender ($p>.05$). Roughly 81% of females compared to 55% of males reported they would seek support if experiencing sadness($p=.00$). Parents were considered primary support among 21% of students, with female respondents being 1.5 times more likely to identify parents as a source of support than male respondents ($p=.00$). More often, students reported significant others (29%) and non-medical student friends (28%) as primary support. Conclusions, Findings showed that students are experiencing depression, albeit mild in severity. The study suggested differences in help-seeking by gender, while students across gender reported seeking support from significant others and non-medical student friends. Medical school programming may want to include significant others and friends outside the medical students' class as these groups often play a supportive role.

141. Korkmaz, Serena

Effects of L1 and S10 Monobodies Bound to HRAS

Undergraduate - Biological Sciences

Oncogenic RAS mutations are implicated in approximately 33% of human tumors and are one of the most widely mutated proteins in human cancer. Synthetic binding proteins, monobodies, have been developed to further understand RAS function. The positive control monobody, CFP-tagged NS1, has been found to selectively inhibit HRAS and KRAS function, with great implications for further cancer research. The monobodies L1 and S10, which are known to bind to nucleotide-free HRAS, were cloned and tagged with CFP to track expression. CFP-tagged L1 and S10 monobodies were transfected into HEK293 cells. Through a series of immunoprecipitation experiments using rabbit anti-flag antibody and western blots probed with mouse anti-flag antibody, it was found that L1 and S10 bind to activated HRAS, which is oncogenic RAS with a point mutation in G12V. In further experiments, ERK activation will be tested by transfecting HEK293 cells with MYC-Tagged ERK and monobodies CFP-S10 and CFP-L1 and detecting with phosphorylated ERK specific antibodies. This will determine whether the L1 and S10 monobodies affect the signaling cascade of RAS. Although the monobodies L1 and S10 are thought to bind nucleotide-free HRAS, binding to activated HRAS suggests promising future studies towards understanding oncogenic HRAS.

142. Koshy, Daniel; Gallik, Kristin; Treffy, Randall; Nakce, Lynne and Saxena, Ankur

Involvement of Canonical Wnt Signaling in Neural Crest Cell Migration

Undergraduate - Biological Sciences

The neural crest is a group of highly migratory stem cells that becomes many different cell lineages in vertebrates, such as melanocytes, craniofacial cartilage, and microvillous olfactory sensory neurons (mOSNs). It is not fully understood how neural crest cells (NCCs) migrate and differentiate. One of the pathways that we suspect plays a role in the migration and differentiation of NCCs is canonical Wnt signaling. Here, we show that Fzd8a, a receptor in the Wnt signaling pathway, is expressed in the olfactory epithelium (OE) of zebrafish when NCCs are migrating into the OE to become mOSNs. These data suggest that Wnt signaling may play a role in the migration of NCCs and/or the formation of mOSNs in the OE. To determine if canonical Wnt signaling plays a role in the migration and differentiation of NCCs, we treated zebrafish embryos with IWR-1, a drug that inhibits canonical Wnt signaling, and 6-BIO, a drug that increases canonical Wnt signaling. Our preliminary data suggest that decreasing Wnt activity increases the number of mOSNs in the OE, while increasing Wnt activity creates a dysmorphic OE. These preliminary results indicate that canonical Wnt signaling may play a role in the migration of NCCs and the eventual formation of mOSNs.

143. Koster, Kevin and Yoshii, Akira

Defining Synaptic Pathology of Infantile Neuronal Ceroid Lipofuscinosis

Graduate/Professional - Anatomy and Cell Biology

Infantile neuronal ceroid lipofuscinosis (CLN1) is a pediatric neurodegenerative, lysosomal storage disorder. CLN1 causes visual failure, seizures, cognitive impairment and death by age 10. CLN1 is an autosomal recessive disorder caused by mutations in palmitoyl protein thioesterase 1 (PPT1), a depalmitoylating enzyme. Consequently, protein metabolism is dysregulated, leading to the accumulation of proteolipid material, lipofuscin. Importantly, lipofuscin is the cardinal neuropathological finding of all CLNs, each of which leads to cognitive decline and death, and is identified in prominent neurodegenerative disorders, including Alzheimer's disease. These proteolipid materials are readily visible as autofluorescent lipopigments (ALs) and deposition of these pathological aggregates correlates with progression of CLN symptoms. While protein palmitoylation directly modulates canonical synaptic proteins, it remains unclear whether AL accumulation correlates with impaired synaptic functions in CLN1. Among the first clinical symptoms of CLN1 is progressive visual failure and loss of visual evoked potential, an indication of neuronal dysfunction. Therefore, we study synapse formation and function in the visual cortex (VC) of PPT1-knockout (KO) mice. While previous studies have documented AL deposition in adult PPT1-KO mice, we demonstrate AL accumulation immediately following eye opening in the PPT1-KO VC. Remarkably, the AL accumulation started in layer IV of the VC, the termination site of thalamocortical projections. Next, we investigated AL accumulation in neuronal cultures and found: 1) ALs accumulate in PPT1-KO cells immediately following mature synapse formation and, 2) increasing neuronal excitability increases AL in PPT1-KO cells. Lastly, immunoblotting of VC tissues revealed altered N-methyl-D-aspartate (NMDA) receptor subunit composition, exhibiting a higher GluN2B/2A ratio, suggesting increased susceptibility to apoptosis. Together, these results suggest that AL accumulation is activity-dependent. In the future, we will explore glutamate receptor function as a therapeutic target for CLN1. Importantly, novel therapeutic strategies for this monogenic disorder will have a broader implications for adult-onset neurodegenerative disorders.

144. Kreutzer, Kayla; Pocius, Stephanie L.; Kling, Leah A.; Stange, Jonathon P.; Skerrett, Kristy A.; Jenkins, Lisanne M. and Langenecker, Scott A.

Prior Non-Fatal Self-Injurious Behavior Increases Predictive Ability of Suicide Attempts

Undergraduate – Neuroscience

The US suicide epidemic has resulted in over 44,000 deaths per year due to suicide. Furthermore, in any given year, self-harm has silently hospitalized almost 495,000 people. The present study examined non-fatal self-injurious (NFSI) behaviors that may predispose individuals to attempt and even complete suicide. These factors include: traditional self-harm, previous suicide attempts, impulsivity, self-detrimental behaviors, diminished value of life, and risky behaviors. A total of 200 participants, aged 18-30, were recruited throughout the Chicago and Ann Arbor areas. Participants completed the Diagnostic Interview for Genetic Studies. Participants consisted of three diagnostic subtypes: Healthy

controls, rMDD, and Bipolar Disorder. Total NFSI for each participant was calculated using summed frequencies. Participants were then assigned to different groupings based on severity of risk: healthy/low, medium, and high risk. Participants completed the Parametric Go/No Go Task and the Facial Emotion Processing Task. The NFSI scale increased variance in predictive ability of past suicide attempts by 4.5% when compared to the predictive ability of diagnosis and traditional self-harm independently. A post-hoc analysis showed a noteworthy effect of self-detrimental behaviors on increasing the predictive value when using the NFSI scale ($F=8.2$, $p=.005$). A chi-square analysis suggests the following cutoffs capture the most at risk with the smallest number of false-positives: 0-3=low; 4-10=medium; 11+=high risk. Surprisingly, NFSI was not related to executive functioning or emotion processing. These results support the basis of NFSI as a potential clinical measure to better detect the risk of suicide. Ultimately, this can better redirect intervention measures and offer personalized treatment.

145. Krmene, Madeline; Korkmaz, Alara; Oleksyuk, Maryna and Aldrich, Leslie

Optimization of a High-Content Screen for Autophagy Modulators

Undergraduate – Chemistry

Autophagy is an evolutionarily conserved catabolic process in which cytosolic content is engulfed, degraded in lysosomes, and recycled. This process is critical to maintain cellular homeostasis, and it has been implicated in numerous diseases, including neurodegenerative diseases, inflammatory diseases, and cancer. Our goal is to discover small-molecule modulators of this pathway to study autophagy in these various disease states. A HeLa cell line stably expressing Green Fluorescent Protein (GFP)-labeled LC3 was used to develop a high-content screen for autophagy modulation. GFP-LC3-I is located diffusely throughout the cytosol, but when autophagy is activated, LC3-I is conjugated to phosphatidylethanolamine to form GFP-LC3-II, which is recruited to the autophagosome membrane, forming GFP-LC3 puncta. These puncta can be counted using fluorescence microscopy to enumerate the number of puncta per cell, which correlates to the number of autophagosomes and indicates the degree to which autophagy is active. Efforts to optimize the assay to enable the identification of both autophagy activators and inhibitors will be presented.

146. Lakkamsani, Aditya

Effects of Social Support on Reported Stress: An Analysis of a Specialized Mentorship Organization Pairing Cancer Survivors with Cancer Fighters

Undergraduate – Psychology

Stress and stress hormones are shown to cause a more virulent and destructive cancer presence by impacting cancer cell DNA and mobility, as well as host immune ability. Strength in internal validity and weakness in external validity is seen with studies

pertaining to these facts. Social support is revealed to have many positive influences on cancer patients, notably reduced stress hormones and longer survivorship. Strength in external validity and weakness in internal validity is seen with supporting research here. These two literatures, despite different strengths, can be integrated to suggest that social support has a determinate impact on cancer's physical progression. The takeaway from this is that social support should play a role in the treatment of cancer patients. This program evaluation of a community agency, which provides telephone social support to cancer patients, will examine the relationship between social support and reported stress. While the actual link to disease will not be measured, the large number of participants will make examining said link meaningful within the population. Furthermore, the agency uses a unique set of cancer survivor mentors and examining the relationships here can further our understanding of providing social support to cancer patients.

147. Lasch, Todd; Corbridge, Susan and Nyenhuis, Sharmilee

Assessment of a Newly Designed Asthma Action Tool

Graduate/Professional – Nursing

BACKGROUND: Asthma is one of the most common public health problems and evidence-based guidelines support the use asthma action plans (AAPs) for patient education and self-management. Pilot data at our inner-city academic institution found that patients with a diagnosis of asthma in our primary care clinics requested more asthma related education. We reviewed our current AAP and created a new asthma action tool (AAT) that included more patient education than our current AAP. **METHODS:** Adult asthma patients and medical providers in sub-specialty and general medicine clinics in our inner city, academic medical center were surveyed using separate patient or provider questionnaires to assess the newly designed AAT. **RESULTS:** In total, twenty-six patients and thirteen providers were interviewed. Several themes emerged from the surveys. 1) Providers do not routinely use or review AAPs with their patients with cited barriers being time and lack of ease of use of current AAP; 2) Provider's initial impression of the new AAT is positive, 3) Providers favored the AAT over the current AAP, however barriers still exist to routine use 4) Patients were in favor of the new AAT as opposed to the current AAP; 5) Patients and one provider were in favor of a computer/mobile based application version of the AAP. 6) Both patients and providers liked the visual display and the increased educational content included on the AAT, including use of spacers with inhalers, triggers, and tips for exercising with asthma.

CONCLUSION: The new AAT was favored over the current AAP by both patients and providers. The new AAT is more colorful, easier to read, and easier to follow. The sections on spacer use for inhaled medications, triggers, and tips for exercising with asthma were highly favored by both patients and providers. Even though the new AAT was favored over the current AAP, there are still barriers to using AAPs/AATs in clinic by providers. As time was noted as a barrier to use by providers, suggestions included prior printing, implementation into the electronic medical record and mobile or computer based application.

148. Lauer, Hans-Christian

Microfinance - Going Beyond Microloans

Undergraduate – Finance

This paper provides insight on the future of Microfinance. Since the beginnings of Microcredit in the 1970s in Bangladesh there have been multiple transitions in the field. MFI's started by providing group loans, then moved to individual loans and nowadays there are a vast variety of products including insurance products. One of the promises of Microfinance was to empower entrepreneurs in developing nations and while entrepreneurial activity has been increasing since its inauguration, most Microfinance backed businesses never employ a single person other than the entrepreneur himself. In this paper I will argue that in order to deliver on the promise of empowering entrepreneurs, Microfinance institutions have to develop current practices and expand their services to the Venture Capital field. There are multiple options to provide seed capital which helps individuals not to become self-employed but found businesses that are able to grow and provide employment for a larger group of people.

149. **Withdrawal**

150. Leitao, Ayesha

Comparison of Enzymatic Activity of Domain, N5-Carboxy-amino-imidazole Ribonucleotide (N5-CAIR) Mutase (PurE), in hPur6 and Bacteria

Undergraduate – Biochemistry

The bacterial enzyme, N5-Carboxy-amino-imidazole ribonucleotide (N5-CAIR) mutase (PurE), constituted in the de novo purine biosynthetic pathway, is known to be targeted for antimicrobial agent development. Specifically, the PurE domain of hPur6 protein (composed of 2 domains, homologous to the bacterial enzyme PurC and PurE, respectively), catalyzes the conversion of N5-amino-imidazole ribonucleotide (AIR) and carbon dioxide to 4-carboxy-amino-imidazole ribonucleotide (CAIR). To test the enzymatic activity of the PurE domain, a method for the preparation of hPur6 was optimized. The growth of hPur6 cells was first facilitated at 37°C, and then at 18°C, upon the induction with Isopropyl β-D-1-thiogalactopyranoside (IPTG) at OD₆₀₀≈0.8. The fusion protein was eluted from Ni²⁺ affinity column, in Imidazole (250 mM) buffer. The hPur6 protein obtained had a purity=89.4%. Furthermore, the enzymatic activity of PurE domain in hPur6 was compared with that of the PurE domain in *Bacillus anthracis* PurE; for which the technique focused on the monitoring of ΔA_{260nm}/Δt values, to determine the rate of disappearance of CAIR in either of the enzyme-catalyzed reactions.

151. Leitao, Ayola

Difference in the PurC Activity of Human PAICS and Streptococcus pneumonia/Bacillus anthracis)

Undergraduate – Biochemistry

4-(N-succino)-5-aminoimidazole-4-carboxamide ribonucleotide synthases (PurC) catalyzes the de novo purine biosynthesis in bacteria and humans. Comparing the activities of the bacterial PurC and human PurC domain is vital in the discovery of antibacterial drugs with minimum side-effects on humans. Escherichia coli cells were utilized as hosts to produce His-tagged human purC (HpurC) protein—the cells were grown at 18oC with the help of a bioflo—harvested cells were lysed and the protein was purified using a Nickel affinity column to yield product of 90% purity. To carry out the comparison, PurC protein from S. pneumonia and B. anthracis were borrowed. The conversion of 4-carboxy-5-aminoimidazole ribonucleotide (CAIR) and L-Asp to succinoaminoimidazolecarboxamide ribonucleotide (SAICAIR), catalyzed by the PurC domain is also accompanied by the hydrolysis of ATP to ADP and free phosphate. In this experimentation, the activity of PurC was tested using Malachite green assay which detected the inorganic phosphate release [Pi] due to enzymatic activity of PurC domain. The specific activity of HpurC was determined to be 24 ± 5 pmol Pi/min/ μ g and that for BaPurC and SpPurC were determined to be 19 ± 6 pmol Pi/min/ μ g and 83 ± 6 pmol Pi/min/ μ g respectively. The study suggested a difference in the PurC activity of the human and bacterial counterpart.

152. Li, Zhihua

Conditional Inhibition of M4 Neuronal Activity via HisCl1 Transgene Potentially Inhibits Pharyngeal Muscle Peristalsis

Undergraduate - Biological Sciences

Caenorhabditis elegans are model organisms; they share many genetic factors and similar biological pathways with humans, potentially allowing researcher to extrapolate their research to medical applications. Neuronal silencing is an important technique for characterizing neuron function and networking. Histamine-titration via histamine-gated chloride channels encoded by HisCl1 is a chemical genetic technique that can reversibly silence certain *C. elegans* neurons *in vivo* without affecting other biological pathways. In this study, this histamine-titration technique was applied to the M4 motor neuron – the neuron that innervates the pharyngeal muscles responsible for peristalsis contraction. A plasmid was constructed with the transgene HisCl1 under the control of the ser-7b promoter, which localizes the gene products in M4 only. Then, the plasmid was introduced into wild-type N2 *C. elegans* genome via microinjection, producing a transgenic strain with Histamine-gated chloride channels expressed only in the M4 neuron. The majority of these transgenic individuals treated with histamine display abnormal pharyngeal contraction – such as impaired peristalsis or absence of peristalsis –

while others display no difference from contraction behavior of wild-type individuals. These results demonstrate that chemical titration with HisC11 can partially inhibit M4 neuronal activity and, therefore, pharyngeal muscle peristalsis.

153. Lorenzo, Christina; Young, Christine; Kazlauskaite, Rasa; Hughes, Donna and Lebowicz, Leah

Developing Interactive Learning for Continuous Glucose Monitoring

Graduate/Professional - Biomedical and Health Information Sciences

This research project investigated how to develop an interactive learning tool for patients utilizing continuous glucose monitoring (CGM), which is one of the newest technologies in diabetes management. A prototype of the interactive learning tool was developed to run real-life scenarios that visualize how meal and lifestyle choices affect glucose trajectories in both healthy patients and patients with type 2 diabetes. This tool is intended to be used by the clinician to engage the patient in an educational discussion about CGM. From this discussion the patient would then apply what they learned to their own CGM data. The effectiveness of this prototype was evaluated during interviews with health professionals who directly interact with patients with type 2 diabetes. The results of the interviews will be applied to the prototype to develop a refined learning tool, which will ultimately be made available as a clinician-guided tool in the clinic and as a stand-alone tool through the web.

154. Lukacz, Matt

Hidden Realities and the Language of the Prophets of Science- in Search of the Mythos of Modernity

Undergraduate – Philosophy

The following essay is aimed at describing social dimension, distribution and consequences of scientific knowledge. To accomplish my goal, I will compare the mythological lore present in the Amazon Basin and the scientific worldview of the industrialized West. Such juxtaposition is focused on the western science, where references to another knowledge system are used to enrich the overall argument and as catalyst of effective self-reflection on the modern society. I intend, in the course of the essay, to communicate heterogeneity of both Amazonian and Western societies. The specific examples will be aimed at underscoring the contexts and mechanisms of knowledge, not the content. In this sense I would like to utilize both methodological constraints of social sciences and conceptual ingenuity and freedom of a philosophical treatise. In the first part I will discuss the role of metaphor in scientific discourse. Subsequently I will describe variations in lay and expert interpretations of knowledge. The essay will be concluded with an overview of the literature interpreting science as mythology.

155. Luu, Anh

The Effect of a Periodontal Pathogen on Pancreatic Alpha Cells

Undergraduate – Chemistry

Epidemiological studies suggest a close association between periodontitis and prediabetes/insulin resistance. However, it is still unknown if periodontitis causes prediabetes in humans. Dr. Watanabe's lab has recently established that periodontitis can be an initiator of prediabetes by using various animal models. It was found that animals with periodontitis by oral application of a periodontal pathogen, *Porphyromonas gingivalis*, exhibited a higher level of SerpinE1 (plasminogen activator inhibitor 1 or PAI-1) expression, β -cell apoptosis, and α -cell proliferation and infiltration into the β -cell core. *In vitro* analysis using the β -cell line MIN6 revealed that oral application of a periodontal pathogen caused apoptosis by both intrinsic and extrinsic pathways. Thus, chronic exposure of a periodontal pathogen induces complex alterations in pancreatic islets. Here, we hypothesized that *P. gingivalis* induces SerpinE1 and uPA expression in α -cells, which will also promote α -cells migrations. The objective of my study was to determine 1) if *P. gingivalis* is detected in pancreas, 2) if SerpinE1 can be detected in both alpha and beta cells, and 3) determine if *P. gingivalis* promotes α -cells migration in vitro. **Methods:** the identification of *P. gingivalis* was performed using immunofluorescence microscopy. SerpinE1 expression was determined by confocal microscopy. Cell migration assay used the α -cell line, α Tc1-6. **Results:** *P. gingivalis* was detected in the pancreas and maxillae of the experimental group compared with the control group. Along with detection of *P. gingivalis*, the size of β -cell core did not change. However, α -cells migrated into the β -cell cores. SerpinE1 was co-expressed with glucagon (α -cell marker). In vitro migration assay indicates that supernatant from *P. gingivalis* culture induced cell migration compared with control (bacterial culture media).

156. Luu, Queena; Villareal, Celine; Monson, Rebecca S.; Oberholzer, Jose; Fritschi, Cynthia and Danielson, Kirstie K.

Concerns and Hopes of Patients with Type 1 Diabetes Prior to Islet Cell Transplantation:A Content Analysis

Undergraduate - Research in Department of Surgery

Objective: Islet transplantation can provide a functional cure for patients with type 1 diabetes (T1D) complicated by hypoglycemia unawareness (HU). This study sought to identify psychosocial factors comprising T1D patients' lived experiences, and their reasons for participating in islet transplant clinical trials. **Research Design and Methods:** Data from 18 patients in the UIC islet transplant clinical trials were available: 13 currently active patients with successful ongoing islet graft function and 5 inactive patients with unsuccessful outcomes (female=11 and 3, mean age at transplant=48.5 and 40.2 years, and T1D duration=32.9 and 23.2 years, respectively). Two content analysts independently manually coded responses from four open-ended questions about patients' concerns and

hopes prior to transplant to identify themes. Results: Lack of control over life due to T1D with HU was the overarching theme. Four common psychosocial themes were identified: fear of hypoglycemia, diabetes-related health complications, hopes/expectations after transplant, and concerns over transplant outcomes. Both groups expressed concerns over managing T1D and HU, with frustrations regarding physiological symptoms as well as disruptions in social and occupational relationships. The active group further emphasized anxiety over dying from HU and the perception of being a burden to family. The inactive group emphasized frustrations due to both the impact of HU on themselves and acute health complications. Both groups' expectations for post-transplantation include physiological and psychological improvements. However, the active and inactive groups' primary outcome concerns were immunosuppressive side effects and transplant success, respectively. Conclusions: We identified psychosocial factors that contributed to patients' risk/benefit considerations for islet transplantation that may not be routinely assessed in clinical practice. These findings could help improve patient selection and may also facilitate patient-provider communication.

157. Macam, Rachel; Poretsky, Rachel and Horswill, Craig

Study of Microbial Community Utilization of Short-chained Fatty Acids and Impact on Energy Expenditure

Undergraduate - Nutrition

The human gastrointestinal tract harbors more than ten trillion microorganisms encompassing more than 1000 distinct species. With recent advancements in sequencing technology, we are beginning to understand the various roles the gut microbiome play under various lifestyles. One important factor is the interplay between the gut microbiome and dietary habits and its impact on modulating energy states in humans, which at present is poorly understood. The purpose of this study was to analyze the dietary profiles of collegiate swimmers at UIC as they undergo reduced, systematic training. We posit that short-chained fatty acid (SCFA) producers in the gut will show significant correlations with macromolecule consumption. Furthermore, the microbial community structure of SCFA producers will mirror energy expenditure by the athletes. To test these hypotheses, we recorded 3-day dietary profiles over the course of the taper with controlled training volume and body composition. Fecal samples were taken to analyze microbial community composition.

158. **Withdrawal**

159. Maghribi, Syeda

Muslim Americans' Navigation through Discrimination: Coping Mechanisms and Implications for Improvement

Undergraduate – Psychology

A psychological literature review was conducted to examine post 9/11 discrimination against Muslims in the U.S and explored various coping mechanisms of Muslim Americans. This paper also discussed potential measures the Muslim community could take to improve the quality of mental health services provided to Muslim Americans. After 9/11, Muslims in America experienced increased level of verbal and physical assaults, hate crimes, and various institutional discrimination. Muslims also presented unmet psychological needs in lieu of discrimination. Neither the scientific community nor the Muslim community are well prepared to provide sufficient mental health services tailored to Muslim patients. Currently the main coping mechanisms included: seeking mental health services through imams (religious figure), masjids (mosques), self-coping, or ignoring the experience. We propose that professional psychology that is culturally sensitive to the Islamic faith and that combines Islamic-based practices with secular ones are necessary to ensure the mental well-being of this population. In addition, involving the Muslim community in the psychology field would further maintain the presence of professional counseling in this group and allow for new, faith-specific methods to be created. Public awareness about Muslims and the Islamic faith may contribute as a crucial factor in decreasing instances of anti-Muslim discrimination.

160. Mandala, Rupashree

The Effect of Social Support on Physical Health of Sexual Assault Victims

Undergraduate – Psychology

About 300,000 people are sexually assaulted each year (RAINN, 2016). Traumatic events, such as sexual assault, are associated with poorer physical health (Ullman & Siegel, 1996). Past research shows that social support is linked to lower incidence of morbidity and mortality, suggesting an influence of social support on physical health for sexual assault survivors (Uchino, 2006). Due to the high prevalence of rape and the negative impacts, understanding ways to help survivors could significantly impact each survivor's lives. Exploring the relationship between physical health and sexual assault may provide another avenue to improve survivors' physical health, by emphasizing the need for positive support sources after a sexual assault. Further studying the influence of social support on physical health can suggest approaches for helping survivors through their traumatic experiences. Based on review of past literature, this project tested the relationship between physical health and satisfaction with informal and formal social support for sexual assault survivors. The data for this research study was collected from the first of three waves of mail surveys completed by 1863 women sexual assault survivors who volunteered to participate in the Women's Stress and Support Study at UIC. Frequencies and correlational analyses were conducted in SPSS by measuring physical health, demographic characteristics, and survivor's overall satisfaction with the social support received from various sources. Significant associations were found between overall satisfaction with support received and physical health. Among the five categories of formal sources explored, physical health was better when survivors were satisfied with

support from the police and rape crisis centers. Under the informal sources, survivors had significantly better health when they were satisfied with the support received from their friends or parents. Moreover, demographics of education and income were also related to survivor's rating of physical health at time of the survey.

161. Mansuri, Nazminbano and Clark, Ginevra

Carbohydrate Chemistry and Social Justice Lab For Pre-Nursing Chemistry Students

Undergraduate – Chemistry

The purpose of this research is to develop laboratory experiments for use in a college-level organic chemistry class for pre-nursing students. This research serves to not only instill fundamental organic chemistry concepts in students but also to integrate cultural competency and social justice in pre-nursing curriculum. The laboratory experiment developed focuses on carbohydrate organic chemistry. Concepts presented include identifying reducing vs. non-reducing sugars using Fehling's Reagent, identifying starch using Iodine Solution, and identifying effects the enzyme amylase has on starch (non-reducing). Students proceed to develop their own method for identifying the effects of invertase on sucrose (non-reducing). Further plans for this research include assessing student work on this experiment to ensure proper analysis and understanding of carbohydrate chemistry. Modification of the laboratory experiment will occur accordingly.

162. Manuel, Dorothy and Zanoni, Joseph

Self-Diagnosing Among College Students

Undergraduate - Public Health

Self-Diagnosing, also known as labeling, is the act of diagnosing oneself with a mental and/or physical illness. Self-diagnosing is potentially harmful because it is, by definition, done without reference to a medical professional. For this capstone, I will ask the research question "What mental health resources do students who self diagnose themselves for a mental illness use, and what barriers prevent them from accessing other resources?" My hypothesis is that cost is a huge factor preventing those who self-diagnose from obtaining professional mental health care, so the resources most commonly used are free ones such as the internet. I am planning on conducting a survey to ask questions in these four categories: Self Diagnoses, Wealth/Income, Mental Health Resource Network and Sources of Mental Health Information. Despite the great importance that self-diagnosing holds in the lived experience of those with mental illness, the field is very new and has little research. Knowing the sources of information which those who self-diagnose most commonly use will allow public health officials to target them in a health literacy intervention. Knowing the rates of help-seeking among those who self-diagnose can also

help legitimize self-diagnosis as at least a good starting point for those with mental illness. Finally, knowing the common barriers can help public health target their interventions towards breaking them down. This study seeks to characterize the phenomena of self-diagnosing for mental illness among college students, in order to improve healthcare delivery and the service of public mental health.

163. Markovski, Teadora and Coumbe-Lilley, John

Exploratory Study of the Effects of Lifestyle Behaviors on Individuals in Spain and Macedonia

Undergraduate - Kinesiology and Nutrition

This was completed as part of an undergraduate study abroad program supported by a Helen Barton Scholarship for undergraduate research investigators. The study was conducted over a nine week period, in Barcelona, Spain and Resen, Macedonia. The first author was trained in visual research methods (Banks & Zeitlyn, 2015) and data collection through participant observations, semi-structured interviews concurrently conducting a gray literature review using information from the WHO organization¹², blogs³ and scholarly works. Interview data was gathered from six interviewees (N=6). Four face-to-face interviews (oncologist, pediatrician, internal medicine and cardiovascular) and two virtual (family medicine and endocrinologist); Spanish interviews (n=3) conducted in English and Macedonian interviews (n=3) conducted in Macedonian. Data gathered in Spain, showed that poor eating habits, little to no physical activity and perceptions that a healthy lifestyle seem like a chore (Costa, Barrio, Cabre, Pinol, Cos, Sole, Tuomilehto, 2012). In Macedonia, the effects of lifestyle behaviors were influenced by accessibility of food, food preparation (Smokovski, Milenkovic, Trapp, Mitov, 2015) and belief that medications make everything better; i.e.: “people will take a pill and eat baklava after.” Data was analyzed by transcribing each interview, noting key phrases, key words and comparing between individuals and groups and checking with second author. These findings supported results found in existing literature demonstrating the effects of unhealthy lifestyle behavior choices. Negative health outcomes in Spanish and Macedonian populations include increases in diabetes caused by poor lifestyle behaviors, types of food eaten, and low activity levels. To take this research further we suggest testing a lifestyle intervention with self-identified Macedonians living in the U.S. with diabetes followed by an experimental design comparing the effects of a lifestyle intervention on two or more ethnic groups of diabetics. The limits of the study were possible language barriers in Spain and subject availabilities to do interviews.

164. Martinez, Lulu

I'm Still Surviving: A Collection of interviews with HIV-positive women from North Carolina

Undergraduate - Gender and Women's Studies

Black/African American and Latina women are disproportionately represented in HIV cases compared to their white female counterparts. While HIV research and data indicate that women of color are among the highest at risk groups, the data also infers that women of color's social location negatively determines their life chances and access to opportunity; we can conclude that HIV prevalence among heterosexual black women is interconnected to gendered anti-black racism. Additionally, a more constructive and less depletive approach to understanding HIV/AIDS and the experiences of women of color, includes a platform in which women identify how their lives are affected by the disease, and what factors helped shape those experiences. Interviews with a group of 10 HIV-positive women, eight of whom are women of color, offer that their HIV diagnosis increased their accessibility to health care and support. Furthermore, their analysis influences their ability to move away from a position of victimhood and helplessness and into a role of active agents that use the resources available to them to create a sense of safety and opportunity. These interviews were made possible through the I'm Still Surviving initiative, led by the History Moves team in partnership with both the participants and staff of the Women's Interagency HIV Study (WIHS), considered the world's longest running clinical research study on women living with HIV. I apply Michele Tracy Berger's 'intersectional stigma framework,' which examines how race, class, and gender based stigma intersects with and influences women of color's experience with HIV, as a tool to interpret and understand this collection of interviews. Ultimately, these women are able to create sense of agency, resiliency and empowerment in their formal and informal networks and their analysis creates an opportunity for them to examine their particular relationship to others as well as institutions of power and oppression.

165. Mason, Jacqueline; Brennan, Kevin; Bond, Samantha and Lebowicz, Leah

Developing an Interactive 3D Learning Experience to Help Students Understand Key Regulatory Processes Associated with Glycolysis

Graduate/Professional - Biomedical and Health Information Sciences

In 2009, the National Science Foundation published the "Vision and Change in Undergraduate Biology Education" report, detailing several recommendations to improve biology curriculum. These recommendations include shifting away from traditionally static methods of teaching, whereby the learner passively acquires facts and equations, to a constructivist style more conducive for engaging students and increasing levels of critical thinking. In addition, undergraduate instruction should emphasize foundational biological principles and provide students with support for transferring these principles to more complex biological phenomena. These curricular endeavors can be supported by the incorporation of interactive visualization materials. The following research project was developed to answer the question: can a visual interactive didactic tool be developed to improve learning outcomes for undergraduate biology students on the topic of allosteric regulation within the context of glycolysis? A 2D animation and an interactive application

were developed to allow students to explore allosteric regulation at both a functional and structural level. To evaluate the effectiveness of the project, a pretest-posttest design method was used during an introductory biology course at the University of Illinois at Chicago in Spring 2017. It is intended that the results of this research will be beneficial for improving the development of interactive applications for science education.

166. Mathew, Merine Lucy and Yantis, Caitlyn

The Impact of Neighborhood Race and Class on Reactions to Environmental Pollution

Undergraduate – Psychology

In 2014, Michigan governor Rick Snyder approved the use of water from the Flint River to supply the city of Flint. As a result, the mostly poor, mostly racial minority residents of Flint have experienced numerous health issues from the dangerously high levels of lead in their new drinking water. The current study examines how the race and class demographics of a neighborhood shape people's reactions to environmental pollution in that neighborhood, much like the recent events in Flint, MI. Previous research demonstrates that people tend to stereotype White areas as clean and well-maintained, but Black areas as dirty and rundown (Bonam et al., 2016; Yantis, Bonam, & Taylor, under revision). Additionally, people perceive White spaces as more desirable when they are middle class versus lower class, but perceive Black spaces as similarly undesirable, regardless of class (Yantis et al, under revision). Therefore, we hypothesized that participants would express more perceived injustice, empathy and willingness to help when an environmental hazard or a disaster affects a White neighborhood compared to a Black neighborhood. We also predicted that these effects would hold regardless of the class status of the Black neighborhood. White Americans (N = 200) completed the experiment online in which they were randomly assigned to read about a neighborhood. Neighborhood demographic information varied, such that the largest racial population was Black or White and the median property value was lower class or middle class. Next, they read an article about water contamination in the neighborhood and responded to measures of empathy, perceived injustice, and willingness to help.

167. Mendez, Seth

Phonological Transfer in L3 Initial Stages

Undergraduate - Hispanic and Italian Studies

Third language (L3) acquisition has risen in interest because whereas second language (L2) learners only have one source of transfer when learning an L2, L3 learners have two potential sources. Few studies have looked at what learners do with their sound systems at the initial stages of L3 acquisition. Which existing language transfers, and why?

This study examines initial stages transfer via the phenomenon called Spirantization, process in Spanish where consonants /b d g/ are realized as their weaker counterparts [β ð γ] between two vowels. This is not a phenomenon in English nor Portuguese. The research questions follow: When examining L3 Portuguese speech production by English/Spanish bilinguals (1) What language is transferred? (2) What motivates transfer? This language group makes it possible to test several predictors of source of transfer, including language dominance, similarity, and facilitation. Participants (n=7) are Spanish/English bilinguals in their first semester of Portuguese and included native speakers of Spanish that acquired English as adults (n=2) and heritage speakers of Spanish (n=5). Participants completed delayed repetition tasks in all three languages. Each trial had a token in the carrier phrase 'I say _____ for you'/Digo _____ para ti (Spanish)/Digo _____ para você (Portuguese) Next, a distractor phrase prompted the participant to repeat the stimulus, and responses were recorded. Critical tokens (two repetitions of 15 tokens n=30) were C(onsonant)V(owel).CV constructions where the critical segment (/b d g/, 10 each) was word medial. If facilitation drives transfer, participants will transfer English since it patterns with Portuguese. If similarity drives transfer, participants will transfer Spanish since Spanish is more similar to Portuguese than English. If dominance drives transfer, heritage speakers will transfer English and L1 Spanish speakers will transfer Spanish. Preliminary results indicate that learners transfer Spanish, even though the heritage speakers are English-dominant. This finding underlines the importance of language similarity.

168. Mertz, Adam

"Lessons in Insurgency: Teacher Unions and Populist Politics in Wisconsin"

Graduate/Professional – History

After the Great Recession of 2008, public sector workers—and teachers in particular—became the targets of austerity policies. Opponents claimed that public-sector workers represented a privileged class, enjoying greater rights and benefits than the general public. In the wake of several public-sector labor conflicts, commentators identified a growing geo-political divide between rural and urban areas. Yet just how and when such a divide developed remains largely unexplored. My dissertation, "Lessons in Insurgency: Teacher Unions and Populist Politics in Wisconsin," examines the rise of Wisconsin teacher unions in relation to the state's farmers, businesses, private-sector unions, and politicians during the 1970s. In doing so, I seek to answer questions fundamental to not only labor history but also sociology and political science: How do identities based upon class and place form? How do these identities influence politics? What types of concerns—political, economic, environmental, ideological—foster the formation of coalitions and eventually cause them to dissolve? In 1970, Wisconsin's reconstituted farm-labor coalition united rural and urban interests to oppose the spread of large corporate farms throughout Wisconsin, electing a strong Democratic governor who served from 1971-1979. By decade's end, the increased power and political activism of Wisconsin's teacher unions, along with rampant inflation and the pressures of suburban sprawl, significantly increased property taxes and compelled farmers to sell their land. These changes strained and

eventually dissolved Wisconsin's farm-labor coalition because members of the farmer organizations believed that private-sector unions, their previous partners in the farm-labor coalition, sided with the same public-sector unions that contributed to the loss of farmlands. My dissertation provides a new understanding of the formation of the rural-urban divide and the enthusiasm for attacking public-sector unions and demonstrates that rural and small-town residents do not inherently oppose unions or other social democratic institutions and policies.

169. Metwally, Ahmed; Ascoli, Christian; Turturice, Benjamin; Rani, Asha; Ranjan, Ravi; Andropolis, Kalista; Dai, Yang; Ferkol, Thomas; Finn, Patricia and Perkins, David

Microbiome Dynamics as Predictors of Lung Transplant Rejection

Graduate/Professional – Bioengineering

Lung transplantation offers the only treatment for multiple chronic diseases.

Transplantation is dependent upon successful resistance to organ rejection. For children, a vulnerable population, the five and ten-year survival for lung transplants is only 52% and 29%, respectively. The reason for this low survival rate is primary due to chronic lung graft rejection in the form of Bronchiolitis Obliterans Syndrome (BOS). Our hypothesis is that the changes in the composition of the pulmonary microbiome are associated with the development and progression of graft rejection which is in turn related to detrimental cardiopulmonary outcomes and poor overall survival in lung transplant recipients.

Samples were obtained from 6 pediatric lung transplant patients over multiple time points. Bronchoalveolar lavage (BAL) samples were collected at approximately 7 time points for each subject. The DNA isolated from BAL is sequenced on an Illumina MiSeq machine. The longitudinal taxonomic profiles demonstrate the phylum Proteobacteria to be the most abundant across all samples. This suggests that certain members of this phylum may indicate a core microbiome in the lung graft. The association between *Pseudomonas aeruginosa* overgrowth and clinically suspected infection requiring antibiotic therapy was evaluated throughout the study period employing a Smoothing Splines ANOVA on the microbial taxonomic time series' profile. Overgrowth of *Cellulomonas* is associated with infection during the early days after the lung transplantation. Conversely, *Bradyrhizobium*, *Acetobacter*, and *Coriobacterium* are more abundant in the non-infected subjects. We also propose MetaLonDA, an R package that can be used to accurately detect metagenomic features (species, genes) relating to the phenotype or disease status, and accurately detect the starting and ending time points when the differences arise. It is able to handle sampling at different time points, unequal number of time points among the subjects, and long gap between longitudinal time points.

170. Meyers, Zoie; McCurdy, Matthew P.; Leach, Ryan C. and Leshikar, Eric D.

Survival Processing: Item and Context Memory Enhancement

Undergraduate – Psychology

It has been suggested that due to natural selection, certain aspects of human memory have been selected for to give us a survival and reproductive advantage. Survival processing is a memory strategy that involves thinking about information in terms of its survival relevance. Research has often demonstrated that processing information for its survival relevance leads to better item memory (i.e., the content of information) compared to a variety of control strategies. The current study aims to examine the effects of survival processing on context memory (e.g., the context in which that item was encountered, such as whether an item was colored green, blue, or red). In Experiment 1, participants viewed objects colored red, blue, or green. Half of the items (i.e., objects) were shown in a plausible color, for example a red apple, and the other half were shown in an implausible color, such as a blue banana. At encoding, participants processed items in either a survival or moving (control) condition. At retrieval, participants were asked to make an item decision (did you see this item before?), and two types of context decisions: source context (in which condition did you see this item?) and color context (in which color did you see this item?) about items they previously saw, as well as new items. Results indicated better item memory for items processed in the survival condition relative to moving, in line with the typical survival processing effects reported previously. Interestingly, there was no context memory difference for the source detail between item processed in the survival or moving condition; however, for the color detail, there was a condition by color interaction, where memory for plausibly colored items was greater than non-plausibly colored items, and this effect of plausibility was stronger in the survival condition compared to the moving (control) condition. Importantly, this suggests that the survival processing memory benefit extends to some contextual details, but only those that tap into the survival utility of items (such as color).

171. Mishra, Abhishek and Rashmi Choudhary

Improving Lung Cancer Detection

Graduate/Professional - Information and Decision Sciences

Problem description: Lung cancer is the leading cause of cancer-related death worldwide. Early detection is critical to give patients the best chance at recovery and survival. It has been founded through research that lung cancer screening using annual low-dose computed tomography (CT) helps in early detection of lung cancer and hence plays a critical role. The objective is to design and develop computer-aided detection systems for optimized CT lung cancer screening that can be implemented on a large scale. We need to develop algorithms that accurately determine when lesions in the lungs are cancerous thereby reducing false positive rate that plagues the current detection technology. We will use a data set of thousands of high-resolution lung scans provided by the National Cancer Institute to develop systems which help predicting whether a CT scan is of a patient who either has or will develop cancer within the next one year of the date the scan was taken. This will get patients earlier access to life-saving interventions, and give radiologists more time to spend with their patients. Solution Strategy: We will use the nodule locations and

extract slices that contain the largest nodule from each patient scan. The general strategy is to threshold the image to isolate the regions within the image, and then to identify which of those regions are the lungs. The nodules can be used for classification by cutting 3D voxels around them and passing it through 3D CNN. Conclusions: After training the models for first segmentation of nodules and then classification of those nodules for lung cancer diagnosis, we generate a score corresponding to each CT scan. This score represents the probability of that patient to either have or will develop cancer within the next one year of the date the scan was taken.

172. Mishra, Atreya; Nieto, Antonio and Kitsiou, Spyros

A Scoping Review of mHealth Interventions Involving Fitbit Devices

Undergraduate – LAS

Background: Physical activity (PA) is a vital component to combat chronic diseases. In recent years, the United States has experienced a decrease in PA. However, new technologies implementing mobile health (mHealth) and personalized activity tracking arise as promising behavior change tools. Objectives: The primary aim of this study is to conduct a scoping review of randomized control trials (RCTs) to examine: (a) the nature of published Fitbit-based interventional studies in terms of their population, intervention, comparison group, and outcome characteristics? (b) Are Fitbit-based interventions effective in improving PA and other health measures? Methods: A comprehensive literature search was performed on MEDLINE , EMBASE, CINAHL, and the Cochrane Library using multiple keywords and subject headings to identify eligible RCTs involving the use of Fitbit devices. Two reviewers (AM and AN) independently performed study selection, data extraction, and analysis. Results: A total of 27 RCTs met the eligibility criteria and were included in the analysis: 10 RCTs on obesity,, 4 on sedentary subjects, 4 on elders, 6 on healthy subjects, and 4 on other random conditions. There were no significant differences in mean number of steps between the intervention and control group in the obesity and elderly studies, but results were mixed in the sedentary group of studies. Significant improvements in moderate-to-vigorous physical activity (MVPA) were observed in 7 out of 9 studies across all groups. Eight RCTs measured weight loss, but only 3 found significantly positive changes in the intervention group: 2 RCTs in the obesity group and 1 in the sedentary group of studies. Conclusions: Fitbit appears to be a user-friendly wearable device and feasible for use in research studies aiming to measure or improve PA. However, results are generally mixed and difficult to interpret due to the high clinical heterogeneity of the studies and complexity of interventions.

173. Misiunas, Ruta

Soviet? I bet "niet": Garden Shelters of Lithuania

Undergraduate – Architecture

During a time of social and economical oppression conducted by the Soviet Union, Lithuanians generated a movement for individuality through the means of architecture. In a state where all aspects of life were controlled and monitored by the government, people started to feel a sense of freedom of expression through the shelters they were able to build on their given land. They had acquired this land on the outskirts of town through their employer. It is highly unlikely any of them had an architectural or design background, as majority of the population were factory workers. Due to city housing being designed and distributed by the government, the residents took this opportunity to design makeshift dwellings in the outskirts of the city to compensate for the lack of personalization in their homes. It can be argued that after the most basic needs like water, food, and shelter are fulfilled; there is a secondary need for freedom to design. In this instance, there was a necessity to express individuality and personality through architecture. This was a movement against communistic architecture and its social constraints. Although, the political ideologies of communism have been replaced with a democracy, the communist architecture still scars the country to this day. Due to the structures being built so fast and so poorly, they are starting to significantly deteriorate. It is an opportunity for Lithuania to tear down the ghosts of communism and to create an architectural fresh start; even the shelters are being torn down to be replaced with modern residential homes. This project stresses the importance of documenting these structures before they and their stories are all gone. Hundreds of these garden shelters have been photographed as well as investigated through architectural drawings, which will be shown at the research forum. Lastly, 3 new typology proposals will be presented.

174. Mitra, Arjun and Lynch, John

Ally to Stigmatized Identity Groups: What Does Being an Ally Mean?

Graduate/Professional - Managerial Studies

This study broadens our understanding of allies by examining the role they play with regards to employees who carry a stigmatized identity. Allies are employees who assume the role of supporting the success of employees with a stigmatized identity (such as members of the lesbian, gay, and bisexual community or employees with disabilities) to bring their authentic selves into work, and also protect them from the adverse consequences of stigmatized identity disclosure in the workplace. Past research have confounded the term ally with behaviors and beliefs and lack clear consensus on how allies may operate in the workplace. We, therefore, propose a coherent definition of an ally to individuals with a stigmatized identity and generate propositions about the antecedents and behaviors related to the role of an ally in the workplace. We further conceptually tease out the differences between an ally and other similar role-based relationships that occur in a workplace such as friend, mentor, and a high social exchange relationship. Using a deductive approach, we created a measure to capture the core identity of an ally. To test the psychometric properties of our measure such as reliability, factor structure, and scale validity, we collect and analyze data from a sample of 150

undergraduate students from the College of Business at UIC. With this measure we will be able to examine the antecedents and behaviors associated with being an ally in the workplace. Keywords: Ally; stigmatized identity; ally antecedents; ally behaviors; supportive relationships

175. Mizyed, Nethaum and Luque, Alicia

Two Languages in One Mind: Examining the Role of Syntactic Co-Activation in Bilingual Language Processing

Undergraduate - Biological Sciences/Neuroscience

A critical issue in bilingualism research is examination of the way in which two or more languages are processed in the mind of bilinguals 1, 2, 3. Previous work has shown that bilinguals' languages seem to interact and influence each other, even when the non-target language is not being actively used, both at the lexical 8, 9 and at the phonological levels 10,11. However, relatively little research has addressed whether the knowledge of the syntactic rules of the non-target language interacts and influences the way in which the syntactic rules of the target language are processed in the bilingual mind. We hypothesize that if interaction between syntactic systems occurs, it may result in the activation of properties of the grammar of one language when processing the other 12, 13, 14. To test this, eighteen participants (Spanish-English Bilinguals N= 10; English Monolinguals N= 8) completed a picture-sentence matching decision task in English while their brain activity was being recorded using event-related potentials (ERPs) following Sanoudaki & Thierry (2014). Participants saw sentences that contained both adjective-noun and noun-adjective pairs, following Spanish syntax, and were instructed to respond only during specific instances. Interaction between the syntactic systems was assessed by measuring the degree of response-inhibition applied between the adjective-noun and noun-adjective pairs that matched the picture and those that did not. Preliminary analysis showed that, overall, participants showed similar neural responses to non-matching adjective-noun pairs. However, when noun-adjective pairs were examined, results showed that bilingual participants showed a different neural response-inhibition modulation than the monolinguals. These preliminary findings suggest that the syntactic properties of the bilinguals' non-target language may be active while processing the other. These results may have implications for theories about bilingual language processing and about language organization in the bilingual brain.

176. Mobasher, Nasim and DasGupta, Bhaskar

On Optimal Approximability Results for Computing the Strong Metric Dimension

Graduate/Professional - Computer Science

The strong metric dimension of a graph was first introduced by Sebő and Tannier (Mathematics of Operations Research, 29(2), 383-393, 2004) as an alternative to the

(weak) metric dimension of graphs previously introduced independently by Slater (Proc. 6th Southeastern Conference on Combinatorics, Graph Theory, and Computing, 549-559, 1975) and by Harary and Melter (Ars Combinatoria, 2, 191-195, 1976), and has since been investigated in several research papers. However, the exact worst-case computational complexity of computing the strong metric dimension has remained open beyond being NP-complete. In this communication, we show that the problem of computing the strong metric dimension of a graph of n nodes admits a polynomial-time 2-approximation, admits a $O * (2^{(0.287 n)})$ -time exact computation algorithm, admits a $O (\lceil 1.2738 \rceil^k + nk)$ -time exact computation algorithm if the strong metric dimension is at most k , does not admit a polynomial time $(2 - \varepsilon)$ -approximation algorithm assuming the unique games conjecture is true, does not admit a polynomial time $(10\sqrt{5} - 21\varepsilon)$ -approximation algorithm assuming $P \neq NP$, does not admit a $O * (2^{o(n)})$ -time exact computation algorithm assuming the exponential time hypothesis is true, and does not admit a $O * (n^{o(k)})$ -time exact computation algorithm if the strong metric dimension is at most k assuming the exponential time hypothesis is true.

177. Montesa, Claire Nicole and Co, Fritschi

Racial Differences in Relationship between Habitual Physical Activity, Physical Function, and Sleep in Adults with Type 2 Diabetes.

Undergraduate - Kinesiology and Nutrition

Background and Aims: In healthy adults and those with type 2 diabetes (T2DM), poor sleep quality has been associated with poor physical function and low levels of physical activity (PA). Little is known regarding the influence of race on these relationships. The aim of this study was to examine racial differences in the relationship between physical function, habitual activity, and sleep in adults with T2DM. **Methods:** We used a descriptive, correlational design. We used t-tests and correlation analyses. Objective habitual activity and sleep outcomes were measured and averaged across 5 days using wrist actigraphy (Actiwatch Score). Sleep measures included wake after sleep onset (WASO), time to fall asleep (sleep latency), and sleep time. Physical function was assessed using the six-minute walk distance (6MWD) test. Glucose control was measured using capillary blood for hemoglobin A1c (A1C). **Results:** A total of 89 (58 Black, 31 White, age 58.3 ± 8.9 years) completed the study. Black subjects were younger (56.7 vs. 61.3) and poorer glucose control (A1C 8.2 vs. 7.1) than whites. Among the total group, habitual activity was associated with sleep latency ($r=-0.45$) and 6MWD was associated with habitual activity ($r=0.381$) and WASO ($r=-0.288$). All $p < 0.05$. In whites habitual activity was related to latency ($r=-0.391$), while 6MWD was related to WASO ($r=-0.409$). In blacks, habitual activity was related to 6MWD ($r=0.42$) and sleep latency ($r=-0.511$), while 6MWD was related to sleep latency ($r=-0.354$). All $p < 0.05$. **Conclusions:** In adults with T2DM, increased habitual physical activity is related to improved sleep, and physical function, but these relationships differ by race and sleep measure. Our findings suggest that healthcare providers should include increasing daily activity as part of their prescription in order to improve sleep outcomes in patients with T2DM.

178. Morales, Veronica

Major Fraud Cases in U.S. History and Fraud Triangle Analysis

Undergraduate – Accounting

Throughout the 20th and 21st centuries there have been numerous cases of fraud. There are different types of fraud, such as embezzlement, skimming, and securities fraud. A common misconception is that fraud examination and auditing are interchangeable. Auditing requires the use of professional skepticism. It is the recurring act of expressing an opinion on a company's financial statements, based on financial information and data. On the other hand, fraud examination requires proof and is a non-recurring act. It occurs when there is reason to believe that there is a deceptive scheme occurring in a company. In order to conduct this examination, there is an inspection of documents, review of outside data, and interviews. Furthermore, the Fraud Triangle, which was introduced by Donald R. Cressey in the 1940's, is utilized in the analysis of cases to determine if fraud is present. There are three elements: Opportunity, Rationalization, and Non-Shareable Financial Problems/Pressure. If one of the elements are missing then it cannot be considered fraud. In the research I conducted, I summarized and used the Fraud Triangle to analyze four of the largest frauds in U.S. history. These cases include, Crazy Eddie, ZZZZ Best Company, Inc., Madoff Securities, and The McKesson & Robbins Scandal of 1939.

179. Muheet, Mariyah and Cao, Dingcai

Melanopsin Activation and Conscious Visual Perception in Humans

Undergraduate – Neuroscience

Since the discovery of melanopsin-containing intrinsically photosensitive ganglion cells as the third class of photoreceptors in the retina, studies have identified the important role of this type of photoreceptor in sub-conscious functions such as circadian clock adjustment and the pupil light reflex. However, their function in seeing (i.e., conscious visual perception) is less clear and the proposed research will determine the perceptual consequences of melanopsin activation in intrinsically photosensitive ganglion cells and the mechanisms that mediate melanopsin's contributions to visual perception. The results will be beneficial in several areas, such as neuroscience, ophthalmology, chronobiology, psychology, psychiatry, and the lighting/display industries.

180. Muralidharan, Sangeetha; Caskey, Rachel N and Boyd, Andrew D

The Challenges of Pediatrics Cohort Discovery in the Age of the Transition to ICD-10-CM

Undergraduate - Bioengineering

Background: International Classification of Diseases (ICD) codes are assigned to each patient during a health care visit for billing and documentation purposes. Centers for Medicare and Medicaid Services (CMS) mandated transition to ICD 10th-Revision (ICD-10-CM) on October 1, 2015. This transition increased the number of codes, proving greater clinical detail for diagnostic codes. This however could lead to a mistranslation of definitions when translating ICD-10-CM to ICD-9-CM for studies using retrospective data. This study evaluates the transition in Pediatrics. Methods: Thirty Pediatric research articles spanning 26-months that contained ICD-9-CM codes were analyzed to measure the impact of translation on pediatric studies. These codes mapped forward to ICD-10-CM codes and then ICD-10-CM codes mapped backward to ICD-9-CM codes using: CMS General Equivalence Mapping (GEM) and ‘Motif’ tool. ICD-9-CM codes that are not mapped back to are recorded as “lost”. Percent “lost” is calculated using number of codes “lost” divided by the number of ICD-9-CM codes per diagnosis category. Results: 3,140 ICD-9-CM codes were examined from the articles and mapped forward to 6,102 ICD-10-CM codes via GEMs. However, backwards mapping ICD-10-CM to ICD-9-CM, only 2,122 ICD-9-CM codes were mapped back. A total of 1,018 (32.4%) of the previously utilized ICD-9-CM codes had no ICD-10-CM codes mapping to them. Conclusions: A substantial number of ICD-9-CM codes, 32.4% in our study, would be lost from ICD-10-CM to ICD-9-CM using only CMS GEMs which could be critical in future retrospective studies. Moving forward, the use of ICD-10-CM codes in research could lead to disparate results compared to studies using ICD-9-CM codes if historical data is inaccurately represented. Researchers need to consider the historical ICD-9-CM data when using an alternative method to GEMs for forward and backward code mapping. The use of proper methods and correct data is important in obtaining accurate results to study diseases.

181. Nabor, Zachary

A Survey of Big Bang-era Nuclear Reactions

Undergraduate – Physics

In the earliest moments of the Big Bang, an enormous portion of the light elements that exist today (hydrogen, helium, deuterium, lithium) were produced by a mechanism called “Big Bang nucleosynthesis (BBN)”. The BBN model uses our knowledge of particle physics, nuclear physics, and gravitation, to make predictions of the abundances of light elements produced in the early Universe. This model is very successful as far as matching theoretical predictions to observed abundances. However, BBN isn’t without its own shortcomings. In particular, BBN makes predictions of higher abundances for lithium than the ones obtained from actual astronomical observations.

Using “ALTERBBN,” a computational program for BBN [1], in conjunction with experimental reaction rates we will be studying the influence of nuclear reaction rates during BBN (around $1.16\text{--}116 \times 10^9$ kelvin), and how they influence the abundances of light elements with respect to hydrogen. We will be researching the responses of

elemental abundances due to changes in BBN-era nuclear reaction rates. Of particular interest, we will examine closely those rates that lead to a lower abundance of lithium isotopes. First simulations of the nuclear reaction ${}^3\text{He}(\text{n},\text{p}){}^3\text{H}$, have yielded substantial decreases in lithium abundances. This reaction modification also effectively reduces the abundances for ${}^3\text{He}$. The influences of this reaction will be of primary investigation.

182. Nagam, Meghna

Comparing Molecular Forms of Docosahexaenoic Acid and their Uptake in BV2 Microglial Cells

Undergraduate - Endocrinology, Diabetes, and Metabolism

Docosahexaenoic acid, or DHA, is an omega-3 fatty acid that plays an important role as a structural component in the skin, retina, brain, and cerebral cortex. DHA is also essential for brain development and function, yet since the brain itself cannot convert its precursors into DHA, people are required to obtain this compound via their diets and across the blood brain barrier. DHA exists in many molecular forms, such as free fatty acids, cholesteryl esters, triacylglycerols, and phospholipids. In this experiment the hypothesis that the phospholipid form of DHA has a greater uptake across the blood brain barrier than the fatty acid form of DHA was tested. Glial cells were grown at the bottom of well plates and incubated with either DHA in lysophosphatidylcholine (LPC) form, which is when DHA is present in the sn-1 position LPC, or incubated with DHA in fatty acid form for 24 hours. The uptake of DHA was then compared via glass chromatography and mass spectroscopy. The results indicate a significant increase in the uptake and transport of DHA in phospholipid form in comparison to the fatty acid form in addition to a varied incorporation pattern for these two different molecular forms. These preliminary studies display the importance of dietary DHA in the phospholipid form for optimal uptake by the brain than DHA in the fatty acid form. This in turn can not only suggests that DHA as a phospholipid can be more beneficial for brain growth and function, but that it can also play a greater role in the prevention of neurodegenerative diseases than current dietary forms of DHA.

183. **Withdrawal**

184. Naser, Siham

Walmart in Jordan

Undergraduate - Business Administration

My capstone project consists of doing extensive research on opening a Walmart store in the country of Jordan. Jordan lacks convenience and variety when coming to shopping. I choose Walmart, because it meets the general needs of people. It has the potential to

generate high revenue when opening close to the city area. My objective is to go deep into the research of Jordan and its current economy. My hope is to find possibilities of how to make improvements and enhance the shopping experience for Jordanians.

185. Nazib, Ashfique and May, Brian

Morphologically Controlled Synthesis of Layered Oxide Lithium-ion Cathode Materials

Undergraduate – Chemistry

Batteries have been historically vital in society for their effectiveness in storing. In more recent times, the importance of battery technology has only increased, due to the energy crisis of the 21st century. With much of the world transitioning from a reliance on environmentally harmful, and exceedingly limited, fossil fuels, development of alternative sources of energy, such as batteries, are of dire significance. Battery research has evolved tremendously within the last few decades with the introduction of lithium-ion batteries, which revolutionized the battery industry by providing unprecedented levels of safety, energy storage capacities and reduced costs¹. Furthermore, there are multiple variables that impact the overall effectiveness of a battery. This includes the cathode and anode materials, which are the sources of charge transfer, the electrolyte, which is the media in between the two electrodes which facilitates ion diffusion, and the mechanical components of the battery. In this work, nickel, manganese and cobalt nitrate salts were reacted in a stoichiometric ratio in a hydrothermal vessel to form a precursor material. Then the precursor material was calcined with lithium hydroxide monohydrate to form the cathode material, LiNi0.3Mn0.3Co0.3O₄. In this report, the cathode material's structural and morphological properties were characterized using powder x-ray diffraction and electron microscopy, respectively. Additionally, reversible electrochemical energy storage was demonstrated using galvanostatic cycling techniques.

186. Ndiaye, Mariane

Characterization of Genes P450 and TGR for Schistoma

Undergraduate – Biochemistry

The purpose of this research assignment was to aid in the characterization of Cytochrome P450 within the species *Schistosoma haematobium* and *Schistosoma japonicum* via polymerase chain reaction (PCR) and gel electrophoresis. PCR consists of three steps: denaturing, annealing, and elongation. This process allows biochemists to amplify portions of DNA. For the first PCR attempt of Cytochrome P450, 5µL of Taq 10x Bufer, 1.5µL of 10µM dNTPs, 33.3µL H₂O, and 2.5µL of reverse primer and 2.5µL of forward primer were used to anneal to 5µL template DNA. This was done with the Invitrogen PCR kit. This PCR used a total of 50µL. Simultaneously, a Phusion kit was used with 10µL of Phusion 5xBufer HF, 1.0µL of 10µM dNTPs, 32µL H₂O, 2.5µL of reverse primer and

2.5 μ L of forward primer for the same about of template DNA for *Schistosoma haematobium* and *Schistosoma japonicum*. For the second PCR attempt of Cytochrome P450, using only the Invitrogen kit, 5 μ L of Taq 10x Bufer, 1.0 μ L of 10 μ M dNTPs, 38.3 μ L H₂O, and 1.0 μ L of reverse primer and 1.0 μ L of forward primer were used to anneal to 0.5 μ L template DNA. This PCR used a total of 50 μ L as well. Cytochrome P450 underwent the PCR procedure using both the Invitrogen and Phusion kits. During research, the analysis of Cytochrome P450 for *Schistosoma haematobium* and *Schistosoma japonicum* were denoted *H₁* and *J₁* and *H₂* and *J₂*, for Invitrogen and Phusion, respectively. Two primers were attached to the ends of each denatured strand, and anneal to the 3' end to amplify the segments. The primers were designed to be complementary to the target DNA sequences that are being amplified via PCR. As mentioned previously, the PCR method consists of three steps at varying temperatures and times, which are repeated for a series of cycles. The first attempt, with the Invitrogen and Phusion kits, with Cytochrome P450 was unsuccessful. However, there was a second attempt made for Cytochrome P450 that produced a product using the Phusion PCR kit. This PCR consisted of the same conditions as attempt 1 with Phusion except the template DNA was replaced with the PCR products of attempt 2 coupled with changing the annealing step temperature to 63°C for 1 minute.

187. Ndukwu, Ifeanyichukwu

The Dynamic Identities of West African Immigrants

Undergraduate - Biological Sciences/Neuroscience

Though Africans are one of the fastest growing immigrant populations in United States, very little has been said or written regarding their migration into this country. West Africans have a great presence in Chicago, yet these “invisible sojourners” remain absent in conversations about integration and assimilation. To combat this lack of knowledge, this study aims to reveal the several ways West African immigrants have come to Chicago, how their thoughts on certain subjects have changed since relocating to the city, which communities they identify with, and their thoughts on “home.” This is done through interviews with the participants conducted within the city of Chicago. The results of the study suggest that there are several communities across American cultures that contribute to the identities of West Africans. They also suggest that religion and interaction with individuals of similar backgrounds. From the interviews, a few differences in the responses between males and females and between those who immigrated as children and as adults reveal how age and gender contribute largely to West African identities. This study increases the knowledge of the West African population in Chicago and may serve as a basis for further studies intersecting with African immigrants.

188. Ng, Chun Chun

Development of an Effective iBook to Educate Veterinary Students about the Ovariohysterectomy Procedure on Small Animals.

Graduate/Professional - Biomedical Visualization

To date, the veterinary students at University of Georgia(UGA) have been required to learn the small animal ovariohysterectomy, known as spaying procedure, on their own. The surgery involves the removal of ovaries and is among the most commonly performed surgeries. Although the procedure is a routine procedure, it is technically demanding and is considered as a foundation for other advanced surgeries. In this project, a comprehensive surgical guide will be created to teach the spaying technique, its related anatomy, complications and potential consequences. It will include text, illustrations, short animations and interactive 3D models in the format of an iBook. Current educational visuals about spaying are limited and inaccurate. Images that are inaccurate or difficult to interpret can place stress on the students. The lack of knowledge and competency pertaining this procedure could be detrimental to both the students' learning experience and to the pets' health. Stress affects the student's ability to recall information and impairs judgement. Visually dynamic and interactive elements have been proven to enhance the quality of learning for students and facilitate recollection even in stressful situations. This guide will be designed not only to effectively teach this technique, but to support the students' memory and promote interest.

189. Nguyen, Tiffany and Collazo, Elizabeth

Students' Perceived Understanding of the Health Information Management Role

Undergraduate - Health Information Management

Interprofessional education (IPE) is a critical step to emerge students from two or more health professions to work collaboratively to provide patient-centered care. Health Information Management (HIM) is essential to IPE because most of the activities surrounding patient care rely on coordination and collaboration of patient's health information (Belz et al 2015). The objective of our research was to examine perceived understanding of the HIM role in the U.S. healthcare system among students' in the UIC Health Science Colleges'. Variations in the understanding of the HIM role were analyzed by the amount of semesters students' have completed in an enrolled program, and by the students' own program designation. The variable gender was also examined. The data set was developed using non-random purposive sampling via a survey in Qualtrics that involved 1627 responses. IBM SPSS version 23 was used to conduct secondary analysis. Chi-Square tests were conducted at a confidence level of 95% and a p-value of 0.05 was used for significance. Based on the results of the Chi-Square tests, we found there are statistical significance when looking at the association between the understanding of HIM and student's program designation, as well as gender. However, there was no significance found between how many semesters a student has completed, to their understanding of

HIM. Research limitations included a limited sample size of males, as well as with respect to amount of semesters completed.

190. Obanor, Winifred

Literature: A Tool for Increasing Health Literacy and Mitigating Effects of Health Disparities

Undergraduate – English

Health literacy extends beyond obtaining, processing, and understanding health information, and it becomes even more vital when examining how that processed information can prompt individuals to make informed health decisions. Thus, health literacy is not simply dependent on the individual, but also on systemic factors. In a NIH study assessing levels of American adult literacy, results showed that 22% had basic health literacy, 14% were below basic, and 12% were proficient. This means that 36% of the American adults have basic or below basic health literacy skills (Kutner et al., 2006). As a member of the Organization for Economic Cooperation and Development (OECD), this phenomenon is particularly alarming for the United States as it continuously proves to be one of the countries with the highest medical expenditure and poorest health outcomes. Thus, this study aimed to explore how embedding fidelity measures in literature could potentially increase health literacy while simultaneously mitigating the effects of health disparity. The key fidelity components of health literacy focused on were: (1) simplicity of health related language, (2) repetition of diagnosed health issue, (3) listing types of symptoms associated with said condition, and (4) utilizing story form/narrative to further explain health issue. Study design included 10 UIC student participants to test if fidelity measures in 3 different short stories improved health literacy. Students were then asked to describe different health conditions based on how they were reported in the stories. Responses were qualitatively coded using ATLAS Ti according to fidelity type and reported interview. Preliminary findings affirm the aforementioned components suggesting an increase in health literacy. While this study serves as an initial reading of how societal literacy could be improved, it also demonstrates the advantage of utilizing literature as a means to educate on health, particularly in clinical areas with poorer health outcomes.

191. Ogunsile, Olu

Understanding Homelessness

Undergraduate - Biobehavioral Health Science

The homeless population is diverse and so are the issues they face. This is a challenge that the public need to understand and how to approach and best serve this population. This paper reviews literature on better understanding the homeless population. It examines the need to understand homelessness and approaching the issue in a multidimensional and

holistic manner. Viewing homelessness objectively and subjectively is key to understanding homelessness and development of appropriate and effective interventions to face the issue and to better build trust between the homeless and the community. Understanding the experience of the homeless person and complexity of issues they face will improve the publics' understanding of how to better serve this population. To understand homelessness, one needs to know that there are different types of homelessness including the most recent homeless, most prolonged (chronic) homeless and the ones in the middle category. Comparing life experiences from these categories of homelessness is a good step in understanding homelessness. To be able to serve the homeless population better, factoring behavioral and physical health issues before an intervention is implemented would be an effective measure to reducing discrimination and the rate of homelessness.

192. Ojeda, Jessica; Onyejiaka, Nneka; Ferrans, Carol and DeVon, Holli

Acute vs. Chronic Lower Back Pain: An Overview of the Effects of Acupuncture on Pain Levels

Undergraduate – Nursing

As one of the most common disorders in the United States, low back pain has been afflicting many people who usually experience at least one episode throughout their lifetime. Low back pain can be defined as either acute or chronic depending on the amount of time that the person experiences the pain. Acute low back pain (ALBP) is pain that usually lasts about 4-12 weeks and differs from chronic low back pain (CLBP) that lasts for more than 12 weeks. Currently, acupuncture is being used as an alternative non-medicinal treatment for both acute or chronic low back pain. To compare the effects of acupuncture and to determine whether acupuncture is more effective in one or the other, this review looked at six articles about ALBP and CLPB and analyzed the pain levels using the Visual Analog Scale (VAS) and looking at their pain levels before and after acupuncture. The type of acupuncture that was used was also noted, whether it was True or Sham Acupuncture. The studies suggest that acupuncture indeed is an effective method of pain management for both patients with CLBP or ALBP and the pain levels showed a higher decrease in pain level on patients with acute low back pain.

193. Oliva, Darlin

The effect of work hours on GPA

Undergraduate – Economics

Working when in school is a risk many students do not want to take. It is a risk that can have several effects on GPA. But are these effects all the same for different individuals? In some cases, students have no other option but to work, therefore they cannot control for the effects that will come along with working. In my research, I focus on the bias that

exists, while working, on student GPAs. There are other factors that affect GPA while working, such as student determination, motivation, family background, and demographics. In my research I explain how to control for such variables in order to narrow down how working hours affect GPA specifically. How will work effect student grades? The effect of work varies on the intensity of work; in other words, the amount of hours that are worked within a time frame. Work intensity can also be defined depending on the tasks and flexibility that come along with various different jobs. All these factors will make different impacts on student GPA. It is not just the general condition of whether students are working or not while getting an education that contributes to the effect, there is much more behind it. In order to prevent bias while searching for the effects of working, non-random selection will be necessary. Students will be randomly selected to work, *ceteris paribus*—all else held constant. In this research project I will identify whether or not it is working what effects student GPA.

194. Olivares, Josue; Foote, Douglas and Horswill, Craig

Effect of Fluid Loss During Intense Resistance Training on Collegiate Athletes

Undergraduate - Kinesiology and Nutrition

The purpose of this study was to determine the sweat rate, fluid balance, and hydration status of collegiate athletes during a bout of intense resistance training indoors. It was hypothesized that sweat rate would average about 1 liter per hour and athletes would be slightly dehydrated following the training bout. A secondary purpose of this study was to determine whether collegiate athlete's drinking behavior differed depending on whether they drank water or a flavored sports drink during training. It was hypothesized that athletes would drink more of the flavored beverage and incur less dehydration during training. To assess fluid loss, collegiate baseball athletes ($n=16$) were weighed before and after two intense resistance training sessions, which were directed by UIC strength coaches. Athletes could drink ad-lib, and the amount of fluid consumed during resistance training was quantified by weighing 16oz. water bottles before and after each session. Observation were made for the amount of water consumed during one training session, as well as the consumption of a flavored beverage designed for rapid fluid absorption (Hydrus®) during a second similar session. Paired t tests were used to compare pre-training mass, fluid loss, fluid intake, and % hydration after the two sessions (mean \pm SD in table; $p<0.05$ for statistical significance).

Trial	Pre-training Mass, kg	Fluid Loss, kg	Fluid Intake, L	% Hydration
Water	82.1 ± 5.2	-0.38 ± 0.19	0.60 ± 0.30	0.28 ± 0.44
Hydrus	81.8 ± 5.5	-0.33 ± 0.18	0.54 ± 0.28	0.28 ± 0.39

T-test result show that there were no differences in initial body mass, volume of fluid loss, fluid intake, or percent of hydration for the two sessions ($p>0.05$). On average, athletes drank adequate volume of fluid regardless of whether the beverage was flavored or not, and thereby prevented any dehydration.

195. **Withdrawal**

196. Origenes, Andrea Kristin; Al Ahmadi, Sami; Koster, Kevin P and Yoshii, Akira

Biomolecular Characterization of Infantile Neuronal Ceroid Lipofuscinosis

Undergraduate - Anatomy and Cell Biology

Neuronal ceroid lipofuscinoses (NCL) are a group of neurodegenerative disorders that are generally characterized by dysregulated sphingolipid metabolism and apoptosis. While there are a total of six subtypes of NCLs with varying ages of onset, the subtype under investigation is infantile neuronal ceroid lipofuscinosis (INCL). INCL affects 8 of every 100,000 individuals world wide. Beginning at around 6 months of age, individuals with INCL may experience visual failure, seizures, and cognitive deficits, which lead to developmental and psychomotor deterioration and death by age 10. INCL is caused by mutations in the palmitoyl protein thioesterase 1 (PPT1), a depalmitoylating enzyme. When functional, it is primarily involved in removing thioester-linked fatty acyl groups such as palmitate from cysteine residues. Consequently, mutations in PPT1 lead to the dysregulation of protein metabolism which cause the accumulation of lipofuscin in neurons. Although it has been established that lipofuscin is a hallmark of INCL and other NCL subtypes, very little work has been done to describe how lipofuscin accumulation is linked to the disease (Bellizzi, 2000; Jalanko, 2009). This study aims to define the earliest onset of lipofuscin accumulation in INCL, prior to the onset of behavioral deficits. The visual cortex in PPT1-KO mice was used as a model system to examine lipofuscin accumulation. Although previous research has characterized gross lipofuscin accumulation in PPT1-KO mice at later ages, ($\geq P60$), the examination of lipofuscin accumulation beginning at post-natal day (P) 11 reveals that PPT1-KO mice begin accumulating lipofuscin as early as P14 in the visual cortex, shortly after eye opening. Accumulation of lipofuscin further accelerates and then finally plateaus by $\sim P33$. The characterization of lipofuscin accumulation from this work may provide a baseline for the pathological correlates for INCL, as well as the other NCL subtypes.

197. Orland, Adriana; Lebowicz, Leah; Wellman, Christa; Mehta, Ankit and Brennan, Kevin

Animating External Magnetic Guidance of Intrathecally Delivered Gold-coated Nanoparticles to Treat Intramedullary Spinal Tumors

Graduate/Professional - Biomedical and Health Information Sciences

Intramedullary spinal tumors (IMSCTs) are rare neoplasms in the central nervous system (CNS), accounting for 2-4% of all CNS tumors (Tobin et al., 2015). Astrocytomas, a common type of IMSCT, are infiltrative and do not lie in a clear plane of dissection between the normal spinal cord tissue and the tumor. This makes removal of the tumor through surgery difficult. Due to limitations in current surgical options, along with the adverse effects of chemotherapy and radiotherapy, the use of external magnets to guide

intrathecally delivered gold-coated nanoparticles has been proposed as a less invasive treatment with fewer side effects for eliminating astrocytomas (Leushen et al., 2014; Tobin et al., 2015). To accompany the emergence of this technique an animation using anonymized patient data was developed to create a new resource to provide an overview of the procedure and to teach grant committees, surgical residents, and surgical faculty about the technique. A qualitative survey was developed using Qualtrics to provide, residents, faculty, and researchers at the University of Illinois at Chicago Neurosurgery and Neurology Departments an opportunity to provide comments. Likert scale questions and qualitative comments confirmed that the animation was effective in accurately portraying the technique and as a new valuable visual aid for neurosurgeons. This new resource will continue to help explain the procedure in anticipated upcoming clinical trials.

198. Otoo, Mary

Maternal Perceptions of Child Eye Care in Ghana, June - July 2016

Graduate/Professional - Epidemiology and Biostatistics

Introduction: World Health Organization estimates 1.4 million annual cases of child blindness. Mothers bear primary responsibility for children's vision care. This study investigates maternal perceptions of child eye problems and non-receipt of eye care in their children's' lives. Methods: Data collected from a convenience sample of women surveyed at Unite for Sight (UFS) outreach program sites across Ghana were analyzed. Bivariate and multivariate analysis assessed the association between maternal perceptions of child eye problem and non-receipt of eye care. Results: Among 260 mothers surveyed, 102 reported at least one child with eye problem (39.3%); 28/102 (27.5%) had not had an eye exam. Mothers whose children had not received an exam were more likely to perceive no benefits of an eye exam from an eye doctor, (8.6 % vs. 2.1%), and more likely to have more than 5 children (9.2% vs. 3.1%). After adjusting for these factors, mothers who had a child with eye problems were less likely to have children who had not received an eye exam ($R_{\text{Padjusted}}=0.45$, $95\%CI=0.36-0.58$). Conclusion: Mothers who reported children with eye problems were significantly less likely to have children who had not received eye exams. However, it is concerning that 28% of mothers who reported child eye problems had not brought children for vision care and that only 15 % of women whose children had no apparent eye problems sought preventive vision care. Maternal perceptions of child eye health should be examined further to better understand and tailor efforts to eliminate childhood blindness globally.

199. Papanikolla, Johanna and Santillan, Jessica

Clay Sourcing and Iconographic Interpretation of Twin Maya Urns

Undergraduate - Biological Sciences

Maya urns are large ceramic containers that play a critical role in Maya religion, predominantly in the Palenque region. Urns possess intricate details, different color schemes, and often depict lords, Gods, or ancestral deities. Dr. Joel Palka, professor of Anthropology and Latin American and Latino Studies discovered that an urn housed at Albion College, Michigan bore an uncanny resemblance to an urn located in the Museo de los Altos in San Cristobal, Chiapas in Mexico. We predict the urns are authentic and have similar origins. To verify authenticity and to permit appropriate comparison, our team closely observed and documented the characteristics and iconographic themes of each urn. Additionally, our team extracted clay samples from each urn for the purpose of performing clay sourcing. To determine if the two urns in question ascended from the same clay source and possibly the same Maya artist, the urn samples underwent mineralogical and chemical composition characterization. Instrumental neutron activation analysis was performed at the University of Missouri Research Reactor center and inductively coupled plasma mass spectroscopy was initiated at the Field Museum in Chicago. The results of the analyses are inconclusive because the samples are currently still being processed. If our hypotheses are correct and both urns are authentic and manufactured by the same artist, then this cloning sheds light on the religious and cultural implications. Identical imagery in Mesoamerican societies suggests that some deities appear in pairs and the existence of some identical images function as a source of power sharing among different societies.

200. Patel, Himanee and Rivera, Selena

Analyzing the Gender Differences between Males and Females regarding Fertility Care and the Factors that Play a Role in Disclosing the Fertility Treatment to their Children

Undergraduate - Biological Sciences

This capstone project will use a subset of data from a larger research project titled “Donor Egg Kinship Family Study”. The capstone project will report on findings from 6 qualitative, in depth interviews that were carried out. The research project was carried out 10 years ago where women who donated eggs and who received eggs were interviewed. Now 10 years later, these same women and their husbands were interviewed. This is a qualitative research, where the interviews are analyzed to see how the perspectives of the participants have changed over time. Women and men who opted for receiving a donor egg were interviewed in the study and shared their insight about their fertility experiences related to receiving donor eggs. This project is important along with the larger study because it examines the gender differences on the insight on fertility care. This study also examines the gender differences between the parents that lead them to the conclusion of whether to tell their children about the treatment. Fertility treatments and research has been recently emerging because it was a taboo back when donor egg treatment first started in 1984, which adds to our understanding as to why the parents’ perspective is usually understudied. This study analyzes the interviews in-depth that were conducted either via phone or in-person. The analysis includes exploring the emotional state, regrets, or hardships of the mother versus the father. Alongside the analysis another in-depth

evaluation is carried out in understanding the different factors that are concerning to the mother versus the father when deciding whether to disclose the treatment to their children.

201. Patel, Milan; Isbatan, Ayman; Chignalia, Andreia Z. and Dull, Randal O.

Effect of Norepinephrine-induced Acute Hypertension on Plasma Volume

Undergraduate – Anesthesiology

During acute hypertension, increased filtration forces cause a shift in plasma volume from the vascular space to the interstitial space, leading to more profound issues such as pulmonary edema (e.g. hypertensive pulmonary edema). This loss of plasma volume is not solely due to an increase in hydrostatic pressure and subsequent filtration, as described by a simple Starling mechanism, but also the result of pressure-dependent mechanotransduction that leads to an increase in endothelial permeability. Our current studies investigate mechano-sensitive signaling pathways using an animal model of norepinephrine-induced hypertension. However, in order to maintain the characteristic elevated blood pressure, intravenous fluid infusion is required. The administration of fluid obscures the true hematocrit (HCT) values that would normally be used to evaluate plasma volume levels. Importantly, each rat requires slightly different fluid administration to maintain blood pressure at target goals. Thus, the objective of this project was to develop a “reverse plasma volume calculator” that corrects for all external fluid administration, derives a true hematocrit and derives the net loss of plasma volume based on the changes in hematocrit. We utilized the aforementioned animal model to a variety of drugs that interfere with mechanotransduction and could be used clinically to treat hypertensive pulmonary edema. For example, we have observed that the local anesthetic ropivacaine has beneficial effects on mitigating hypertensive pulmonary edema. To quantify the effects of ropivacaine on plasma volume loss in our model of HPE, we used the reverse calculator. Our results quantify the increased loss in plasma volume in norepinephrine-induced animals, but also indicate that this loss is attenuated by ropivacaine. These findings support the use of the reverse calculator as a tool for the measurement of whole body mechanotransduction and also serve as preliminary evidence for the protective role of ropivacaine in acute hypertension.

202. Patel, Neha

Lichen Red-Listing - Examining Threats to Lichen Populations and Species

Undergraduate - Biological Sciences

Lichens are composite organisms and as a group have the ability to live in almost any environment on the planet. Individual lichen species are, however, also very sensitive to environmental changes within their habitats. This makes lichen populations a good way to monitor the magnitude of environmental flux within a particular habitat and to judge the level of climate change that occurs in different regions around the world. Urban

environments are particularly prone to environmental flux due to human impact. The lichen red-list project ranks lichen species according the risk of extinction their populations face using data on geographical distribution, population trends, habitat stability, and taxa establishment. The lichen populations with habitats in urban areas were hypothesized to be at greater risk for extinction. While the data supported this trend, there were also lichen populations that still showed risk for extinction despite having habitats in less urban areas. This suggests that lichens are very sensitive to the environmental changes in their habitat regardless of the level of urbanization in that area. In order to preserve lichen species, both habitat conservation and environmental stability are crucial.

203. Patel, Pooja; Marchese, Enza; Monson, Rebecca S. and Danielson, Kirstie K.

The Effect of Undercarboxylated Osteocalcin on Pancreatic Islet Apoptosis and Integrity

Undergraduate – Surgery

Type 1 diabetes (T1D) is an autoimmune disease in which the insulin-producing β -cells within pancreatic islets are destroyed. Osteocalcin (OC) is a protein secreted by osteoblasts during bone formation. Undercarboxylated osteocalcin (ucOC), a particular fraction of OC, has been shown to increase both β -cell proliferation and insulin secretion in animal models. The purpose of this study was to investigate the effect of culturing isolated human islets with human ucOC on β -cell apoptosis and islet morphological integrity in vitro for potential application in future β -cell replacement therapies for T1D. Islets from one human donor were cultured in human ucOC (0, 1, and 15 ng/mL) for seven days. Islets from another human donor were not cultured in ucOC and were maintained as a pellet for two hours to induce hypoxic β -cell apoptosis and decreased islet cell integrity, serving as the positive control. Apoptosis was quantified by the proportion of β -cells that immunohistochemically stained positive for TUNEL (terminal deoxynucleotidyl transferase-mediated dUTP nick end labeling). Islets stained with hematoxylin and eosin were scored for characteristics indicative of cellular damage on a scale of 0 to 4 (increasing proportion of total islet surface area with respective characteristic): nuclear pyknosis (condensed chromatin), eosinophilia (excessive cytoplasmic binding of eosin), vacuolization (vacuoles in cytoplasm), central necrosis, and nuclear and peripheral fragmentation. Apoptosis quantification and morphological scoring are currently in progress. If islets cultured in higher ucOC concentrations present with fewer apoptotic β -cells and greater morphological integrity, we may conclude that ucOC protects β -cell survival and islet integrity. Future clinical applications may include culturing islets with ucOC to preserve and enhance islet mass and function for future β -cell replacement therapies for T1D.

204. Patel, Saavan; Gong, Liang-Wei and Li, Wenping

Exploring the Role of Clathrin in Bulk Endocytosis

Undergraduate - Biological Sciences

In response to nerve stimuli, presynaptic membrane depolarization induces activation of voltage-gated Ca²⁺ channels, leading to synaptic vesicle exocytosis that mediates synaptic transmission. To sustain neurotransmission during stimulation and to prevent the expansion of the plasma membrane, synaptic vesicles must undergo local endocytic recycling. Clathrin-mediated endocytosis is a well-known and well-studied mechanism of this endocytosis, and relies heavily on the function of clathrin as the name suggests. The mechanism of bulk endocytosis on the other hand, is largely unknown. My project aims to study whether clathrin is involved in the mechanism of bulk endocytosis. To do so, I will disrupt clathrin in mouse chromaffin cells from the adrenal medulla, and observe whether a bulk endocytic event still occurs. Clathrin disruption will be facilitated via fluorophore-assisted-light-inactivation by the use of a reagent called FlAsH (4',5'-bis(1,3,2-dithioarsolan-2-yl)fluorescein). I have successfully designed and cloned a construct that expresses clathrin with a transgenically encoded C-terminal tetracysteine tag (c-flag-4c) that provides a binding site for FlAsH to facilitate both fluorescence and photoinactivation. This construct will be delivered to mouse chromaffin cells via lentiviral transduction in order to induce expression of our modified clathrin. Successful delivery of the c-flag tagged clathrin will allow photoinactivation of clathrin with proper illumination in order to study the occurrence, or lack thereof, of a bulk endocytic event upon clathrin disruption. Patch clamping will be used to detect bulk endocytic events which are characterized via changes in the area of plasma membrane measured through capacitance. If clathrin disruption via photoinactivation blocks the occurrence of a bulk endocytic event, then we would be able to conclude that clathrin is involved in the mechanism of bulk endocytosis, and vice versa. Either way, we would be able to provide valuable new information concerning the relatively unknown mechanism of bulk endocytosis.

205. Patel, Vaidehi; Tussing-Humphreys, Lisa; Thomson, Jessica and Goodman, Melissa

The Relationship Between Diet and Depressive Symptoms in Pregnancy

Undergraduate - Biological Sciences, Psychology

Introduction: Maternal, fetal and long-term infant health can be significantly impacted by maternal antenatal depression. Some of the immediate risks include maternal self-harm, preterm birth and low birth weight and the long-term effects include altered stress response and chronic health conditions in the infants. Therefore, identifying therapies that can prevent or treat antenatal depression is an important issue to research as it can positively affect the health and wellbeing of women and their children. Diet is one factor that may significantly affect maternal mental health during pregnancy. The goal of this project was to assess the relationship between maternal nutrient intake and dietary quality at mid-gestation with depressive symptoms of rural, Southern, pregnant women enrolled in a home visiting intervention program. Methods: Participants included 82 pregnant women residing in the Lower Mississippi Delta Region of Mississippi. In the fourth month of gestation, socio-demographic, anthropometric, mental health, and diet-related

data was collected in the participant's home by trained parent educators. Results: Women were 23.0 ± 4.6 years old, 96% were African American, 44% were obese, and 84% were receiving WIC benefits. Of the 82 women, 56 endorsed no depressive symptoms, 13 endorsed mild-moderate depressive symptoms and 13 endorsed major depressive symptoms. There was no difference in the macro- or micronutrient intake or dietary quality between women reporting no depressive symptoms versus those with mild-major depressive symptoms in the 2nd trimester of pregnancy. Conclusion: The association is likely more complex than diet and antenatal depression independently predicting the other. Larger prospective studies targeting early pregnancy through postpartum with a more heterogeneous sample may allow for a more thorough assessment of the relationship between diet and depression in the perinatal period. Lastly, diet and lifestyle interventions designed to test the causal effect of diet on maternal depressive symptoms in pregnancy.

206. Patel, Yash

Novel In Situ Method for Permeability Measurements in Lung Perfusion Studies

Undergraduate – LAS

We have developed a novel in situ method for measuring permeability in rat lung perfusion studies. Previous methods relied on weight to dry weight ratios and lung weight to obtain similar measurements. We instead rely on pressure differences within the lung to then convert into permeability values. Increases in permeability will result in larger pressures within the lung to further displace a bubble in a small capillary pipe. Bubble displacement is measured with a vision processing algorithm via a camera which then converts the rate of bubble displacement into permeability values. The disadvantage of this system is that unlike weight measurements, it cannot offer continuous permeability values. This is offset by the benefit that the lung need not be removed from the organism and can reduce occurrences of lung damage during excision and thus allow for more precise measurements. And for many lung perfusions, having second by second permeability values is not as important as insuring lung samples are not damaged during surgery. We hope this system can allow for easier permeability measurements and can allow novice lab hands to participate in experiments easier.

207. Perez, Elliott; James, Drexler and Bonam, Courtney

It's all in the Genes: Ancestry on Dehumanization and Infrahumanization

Undergraduate – Psychology

The effect of Infrahumanization and dehumanization was analyzed via the manipulation of ancestry through differentiation in biracial families. This study focused on answering whether different scenarios of ancestral racial composition would lead to heightened levels of infrahumanization and dehumanization by subjects. This study contains similar stimuli to that of a previous study conducted by Ho, Roberts, and Gelman (2015), which

analyzed the categorization of multiracial individuals on social stratification. Participants were presented with a between subjects design with three different Black/White biracial scenarios of ancestral lineage. From this information, participants were instructed to evaluate different stimuli (i.e. infrahumanization, categorization, dehumanization, stereotypes, genes). Information from this study yielded results that suggested no main effect in participants' perception of dehumanization, however, a main effect of infrahumanization via ancestral manipulation. In short, this study suggests that individuals tend to affiliate people with "more black" lineage as having less secondary emotions.
Keywords: Dehumanization, Black Genes, Categorization, Negative Emotions, Infrahumanization, Black Stereotypes

208. **Withdrawal**

209. Pham, Don; Valencia-Olvera, Ana; Avila-Munoz, Eva; Faulk, Naomi and LaDu, Mary Jo

Remodeling Lipids in the Brain: A Novel Therapeutic Target?

Undergraduate - Anatomy and Cell Biology

The *APOE4* gene is the greatest genetic risk factor for Alzheimer's disease (AD), encoding the protein apolipoprotein E (apoE), the protein component of lipid particles (lipoproteins) in the brain responsible for the transportation of cholesterol and other lipids. The *APOE* gene encodes 3 natural variants: *APOE2*, *APOE3* and *APOE4*. *APOE4* increases the risk of developing AD, the common *APOE3* variant is neutral, and the rare *APOE2* variant is protective. Thus, the function of apoE4, apoE3 and apoE2 is isoform-specific. As structure predicts function, *our therapeutic approach is to correct the structural differences between apoE3 and apoE4*. The primary difference between apoE3 and apoE4-containing lipoproteins is their lipid composition, size/shape and stability. ApoE4 is less lipid-associated and stable, forming small discoidal particles. On the other hand, apoE3 is more stable, more lipid-associated and forms bigger particles than apoE4. Moreover, apoE4 is related with brain inflammation, a process that is observed in AD. In the brain, glia cells (principally astrocytes) mediate the inflammatory response and are responsible of apoE particle production. To promote the structural remodeling of apoE, two compounds were assessed in astrocyte cultures: "Compound A" to increase lipid (cholesterol) efflux and "Compound B" to increase lipid (free cholesterol) availability. We found that both compounds increased the concentration of apoE depending on the *APOE* variant being "Compound A" more effective. With results validated *in vitro*, future studies will be performed *in vivo* to confirm the potential beneficial effects of these compounds.

210. Pham, Minnie

Exploring the Relationship between Training Condition and Working Memory in Second Language Acquisition of a Complex Structure

Undergraduate - Literatures, Cultural Studies, and Linguistics

There is no “proven method” or common consensus on the best way to learn a second language; one can raise the question, however, whether learners with certain aptitudes would benefit from learning under certain conditions over others. The goal of this research was to explore the relationship between training condition, linguistic complexity and individual differences in second language learning. Specifically, we examined the role of working memory when learning a complex form in Spanish under different training conditions (i.e., implicit and explicit). Students were recruited from second-semester college Spanish classes and exposed to a novel form in Spanish, the third person subjunctive used in expressions of doubt [e.g., No creo que baile todos los días (I don’t believe he dances every day)]. The participants were assigned to one of three groups: PI (processing instruction and structured input practice), SI+ (meaningful exposure and structured input practice) and C+ (meaningful exposure only). A pre-test was administered before each training condition, followed by a post-test; a delayed post-test was held approximately two weeks afterwards to measure overall retention. Additionally, all participants completed a battery of shortened complex span tasks (operation span, reading span and symmetry span) to test working memory. All groups demonstrated improvement between the pre- and post-tests, although this improvement was minimal, with no groups performing consistently above chance. Participants in C+ and PI groups with higher working memory scores were observed to have higher proficiency scores; these results were statistically significant. Overall, the results suggest that working memory may play a role in second language learning, but its role may differ depending on the training condition. In future research, a larger participant pool may reveal stronger trends.

211. Phung, Jenson

Determining the Effects of Novel Ku70/80 Inhibitors on CRISPR/Cas9-mediated Double Stranded Break Repair Outcomes

Undergraduate - Biochemistry and Molecular Genetics

Modification of genomes has been made widely accessible through the adoption of CRISPR/Cas9, a system that can be programmed to introduce double stranded DNA breaks (DSBs) in a gene of interest. Genome editing outcomes are determined by how a cell chooses to repair a DSB, and in nearly every scenario, the cell will favor the error-prone pathway of non-homologous end joining (NHEJ) over the precise homology directed repair (HDR). This preference for NHEJ remarkably limits the frequency of precise CRISPR/Cas9-induced edits. To increase the rate of HDR, we performed phage display in collaboration with Dr. Brian Kay’s lab to develop FN3 domain-containing monobodies that bind with nanomolar affinity to Ku70/80, the first responders of the NHEJ pathway. These novel affinity reagents mediate a 2-3 fold increase in the occurrence of HDR at endogenous loci in mouse Neuro2a cells and also decrease the frequency of genetic disruption in mouse embryonic stem cells. Furthermore, our monobodies show decreased the toxicity levels when compared to those observed with

using siRNA against Ku70. Currently, we conclude that our affinity reagents improve HDR frequencies by the suggested mechanism of binding Ku70/80 to disrupt its NHEJ functionalities.

212. Pieczynski, Alexander

Web-Based Audio Signal Processing

Undergraduate - Computer Science

Waspy, which stands for Web-Based Audio Signal Processor, is a web application that will allow a user to choose an audio source and some filter for that audio to be run through. The resulting audio will then be streamed back to the user. The user simply copies and pastes a link to some audio source (such as a YouTube video) and the application will stream the source back to the user with the altered audio. The user can then share a link to this page on social media so their friends can view the same video with the altered audio. Example of what a user might want to do with the audio is add distortion, auto-tune, reverb, and other effects. Using these different effects, the user gets to interact with the content they would otherwise only be consuming. Waspy's goal is to give users an easy way to creatively interact with web audio content. Through this user interaction, new life can be given to old media.

213. Pocius, Stephanie and Langenecker, Scott

Levels of Non-Fatal Self-Injury Predict Network Connectivity Changes in Remitted Major Depressive Disorder

Undergraduate - Psychiatry

Of the annual 14.3 million Americans diagnosed with Major Depressive Disorder (MDD), recent studies have supported that nearly one-third to one-half of MDD adolescents have engaged in some form of Non-Suicidal Self-Injury (NSSI). According to the American Foundation for Suicide Prevention, for every twelfth person admitted to the hospital for NSSI, one death by suicide is reported. A broadened Non-Fatal Self-Injury (NFSI) definition was created using a multitude of variables that may attribute to an increased susceptibility to suicide attempt. The NFSI definition includes traditional NSSI (cutting, burning, etc.), impulsivity (impulsivity questionnaires, ADD/ADHD history, gambling behavior), self-detrimental behaviors (bulimic and anorexic tendencies, tobacco abuse), decreased value on life (antisocial personality traits, depressive symptoms), risky behaviors (alcohol, marijuana, and illicit drug abuse), and past suicide attempts. An individual's score using the NFSI variable places them into a low, mild, or moderate risk for suicidal behavior. Using this NFSI variable, along with functional magnetic resonance imaging (fMRI), ongoing analysis may indicate a relationship between brain connectivity and severity of NFSI, and thus may be used as a strong predictor for suicide attempt. Another supplemental portion of this project will examine, using fMRI data, the differing

neural circuits between those with no suicide past, a history of a mood disorder with no suicidal past, and a history of a mood disorder with a suicide attempt. These relationships have the potential to improve current treatment for those who suffer from not only depression and self-injurious behaviors, but also decrease the chance of suicide attempt for these individuals using precautionary measures.

214. Ponce, Ernesto

Developing an Assessment of Children's Perceptions of Teachers' Contingent Reactions (CPCR)

Undergraduate – Psychology

The transition into formal schooling can set children towards success or failure in both academic and social domains. Throughout schooling, but perhaps most especially during these early years, a child's abilities to express healthy emotions, understand emotions of self and others, regulate emotions, attention, and behavior, make good decisions regarding social problems, and engage in a range of prosocial behaviors, all work together promote a successful school experience. However, many children have deficits in these skills by school entry. Because SEL is so crucial, programming to promote it, and assessment tools to pinpoint children's skills, are vital. Teachers provide emotional information to their students is how they react to children's emotional expressions (e.g., giving a child a hug vs. telling a child to "stop crying"). Through these reactions, children learn whether an emotion is acceptable or not in a classroom context. Previous research has focused on observing teachers' contingent reactions in the classroom; currently, there is no way to assess whether and how children perceive their teachers' reactions. This study looks at this gap by asking: (1) How do children perceive their teachers responding to their emotional expressions; and (2) Can young children report on how their teacher reacts to their emotional expressions in a reliable and valid way? I hypothesize the following: children will be able to report on teachers' contingent reactions through a semi-structured interview process. However, the reliability of their reports may vary by the emotion they express or the type of response a teacher gives (e.g., may be more in agreement with others students and/or teacher reports for positive emotions). Finally, I expect that children will report that teachers mostly use comforting types of reactions and tend to respond in positive ways to children's negative emotions.

215. Povlick, Jazmine; Kim, Anna; Wolf, Nina and Fung, Leslie W-M

BaPurE and hPur6 and its Inhibitors

Undergraduate – Chemistry

BaPurE is an enzyme found in *Bacillus anthracis* cells responsible for purine de novo biosynthesis. Purines are needed for the synthesis of RNA and DNA molecules. In solutions and in cells, BaPurE is a homo-octamer. Due to its importance in *Bacillus*

anthracis life cycles, this protein is a target for antibiotics development. Inhibitors were previously determined for BaPurE. One of the compounds identified to inhibit the conversion of N5-carboxy-amino-imidazole ribonucleotide (N5-CAIR) to CAIR by PurE was LC1. The activity of this inhibitor was studied in BaPurE using 4-nitro-5-amino-imidazole ribonucleotide (NAIR), a known inhibitor, as a control. hPur6 is a protein with a domain similar to that of BaPurE found in humans. The same two known inhibitors of BaPurE were studied using hPur6 also to determine if similar inhibition occurs with this protein. Our goal is to find a compound that will inhibit BaPurE but not hPur6. The amount of inhibition by NAIR and LC1 in BaPurE was found to be 69% and 71%, respectively and in comparison, 39% and 17% inhibition in hPur6, respectively.

216. Pratt, Brittni

Infant and Young Child Feeding Practices in Haydom, Tanzania

Undergraduate – Anthropology

Research shows that livelihoods and food security are related to Infant and Young Child Feeding Practices (IYCF) practices. Data collected as part of the MAL-ED study in Haydom Tanzania (TZH) were used to examine relationships among measures reflecting a farming livelihood and IYCF patterns over the infant's first eight months of life. Longitudinal data were collected from a cohort of mothers and infants (n=250) from birth to 24 months of age. Standard maternal and household characteristic data were collected. Monthly and bi-weekly questionnaires were used to capture infant feeding and dietary data. These datasets were combined to produce eight months of IYCF patterns. Results showed that breastfeeding initiation was the only IYCF guideline successfully achieved. Early interruption of exclusive breastfeeding was common. At 180 days, there were no infants being exclusive breastfed. The average duration of exclusive breastfeeding was 38 days and the average duration of full breastfeeding was 50 days. Exclusive and full breastfeeding dropped 30 to 120 days, with exclusive breastfeeding decreasing from 62% to 1.6% and full breastfeeding decreasing from 72.4% to 4%. Land and cattle ownership were important indicators of early introduction of cow milk; food insecurity also played role in this. At age six month, infants need foods other than breastmilk. Between 6-8 months of age, fewer than 10% of infants had a minimally acceptable diet. From monthly 24-hour recall data, two micronutrients, iron and vitamin A, were assessed. Less than 35% of infants ate iron-rich foods and less than 20% consumed foods high in vitamin A. This study shows that over the course of eight months, the diets of these infants are not optimal for breastfeeding, supplementary or complementary feeding. Results indicate a need for programs to reduce the early introduction of foods and improving the quality of infant diets.

217. Qadeer, Manal; Welke, Lauren and Tussing-Humphreys, Lisa

Associations between Mediterranean Diet Adherence, Depressive Symptoms and Cardiometabolic Biomarkers in Pregnancy: Results from the National Health and Nutrition Examination Survey (NHANES), 2005 – 2010.

Undergraduate - Kinesiology and Nutrition

Introduction: Up to 20% of women experience depression during pregnancy. This is concerning given depression can confer immediate as well as long-term health risks to the mother and infant including maternal self-harm, preterm labor, and neurocognitive dysfunction in the offspring. A Mediterranean Diet (Med Diet), a plant-based, olive oil-rich diet pattern, has been linked to mental health and cardiometabolic health benefits. However, no studies have examined the relationship between consuming a Med Diet on a woman's mental health in pregnancy. The objective of this study was to determine associations between adhering to a Med Diet and self-report depressive symptoms and cardiometabolic biomarkers in pregnancy. Methods: Pregnant women 18 – 45 years old ($n = 353$) included in the NHANES 2005 – 2010 datasets were analyzed. Dietary intake was assessed from one 24-hour diet recall and depressive symptoms via the Patient Health Questionnaire-9 (PHQ-9). Socio-demographic, laboratory, and physical examination data was also examined. Med Diet adherence was calculated using the Alternate Med Diet score. Survey weighted means (\pm SEM) by median Med Diet score (< 3 vs. > 3) are presented. Chi-square and linear regression were used to test for differences in the categorical and continuous variables between groups. Results: There was no difference in PHQ-9 score or PHQ-9 depression category for women with higher vs. lower Med Diet scores. A higher Med Diet was associated with significantly higher circulating HDL cholesterol and intake of iron and folate and lower intake of saturated fat and cholesterol. Conclusion: Adherence to a Med Diet was not associated with reduced depressive symptoms in pregnancy. However, adherence to a Med Diet was associated with higher HDL cholesterol levels and intake of micronutrients known to sustain a healthy pregnancy. Controlled intervention studies designed to examine the role of the Med Diet on depressive symptoms in pregnancy are needed.

218. Raber, Tiffany; Lebowicz, Leah; Oto, Aytekin; Brennan, Kevin; Hughes, Donna and Westin, Charles

An Interactive Program Incorporating 3D Models and 2D Illustrations for Enhanced Prostate MRI Training

Graduate/Professional - Biomedical and Health Information Sciences

PURPOSE: The goal of this study is to create an educational interactive module that will visually teach techniques in accurately detecting pathological structures in prostate cancer using magnetic resonance imaging. MRI scans have become highly accurate in detecting lesions in the prostate and it is important that proper training is provided. The ability to visually think and engage one's spatial memory is critical when visualizing this MRI data.

3D models of prostate tumors will be created that correspond to MRI data of specific pathological cases. This research strives to increase understanding and allow for earlier diagnoses of prostate cancer, therefore increasing patient outcomes. MATERIALS AND METHODS: MRI data of patients with prostate cancer will be imported into Materialise Mimics® to extract 3D models of the prostate and tumors. Autodesk 3dsMax® and Pixologic ZBrush® will be used to optimize and texture the models. These models will then be compiled with Unity into an interactive module, giving the users control of rotation, opacity, labeling and isolation of anatomy. The MR sequences will also be embedded so users may directly compare the pathology on the scan to how it exists in three dimensions. Additional illustrations, content, and assessments will be included to reinforce the material. RESULTS: A randomized controlled experiment will be tested on radiology residents to acquire qualitative data to measure the effectiveness of the module prototype. In theory, this application will improve the education of MRI interpretation by bridging the gap between textbook reading and real-life experience. CONCLUSION: If successful, this research will play a crucial role in increasing the understanding of identifying pathological structures of the prostate in MRI scans. This interactive application will reduce the cost of MRI education while teaching spatial learning, critical thinking and valuable anatomical skills all at a user's control

219. Rahman, Rafid; Clark, Maureen; Balakrishnan, Rithvik; Rotert, Paul and Dykens, Andrew
Community-engaged, Participatory Cervical Cancer Visual Screenings in rural Africa: Best Practices

Undergraduate – LAS

In 2008 alone, physicians worldwide diagnosed an estimated 529,000 new cases of cervical cancer and approximately 274,000 died from the disease [a]. Given the statistic that cervical cancer comprises around 12% of all cancers in women worldwide, the convincing literature illustrating impact of the screen and treat approach, and the abundant existing curricular and implementation guidance materials, it remains surprising that the implementation of this health service remains limited on the second most common cancer in women [b]. This review focuses on the literature describing research or policy considerations that have implications in the implementation or strengthening of cervical cancer prevention services at the decentralized level in Africa. The purpose is to review the information present for strengthening health services where a visual inspection approach is already used in the general health service setting, or where this approach is appropriate for implementation. The review informs ongoing partnered cervical cancer prevention implementation research in Southeastern Senegal to improve service quality, increase service utilization among target age women in local communities, and assure sustainability of the implemented health service. The authors hope that the aggregated best practices and evidence will further facilitate the strengthening of cervical cancer prevention health services in similar contexts. The policy intentions are to demonstrate the importance and applicability of cervical cancer screening services to create sustainable policy that emphasizes these services into routine medical care. The nature of impact is to raise the level of discourse related to cervical cancer, increase capacity of existing health

systems, improve the quality of scope of services, and transition to a self-sustainable approach. Furthermore, the impact of travel, cost, burnout, education, and social support will be explored.

220. Rahman, Tahsin; Indacochea, J. E. and Ebert, W. L.

Effects of Added Molybdenum on Corrosion of 316L Stainless Steel

Graduate/Professional - Civil and Materials Engineering

Molybdenum is a major constituent of metallic fuel wastes to be immobilized with steel cladding in an alloy waste form. The effects of added molybdenum (5-20 wt%) on the corrosion behavior of 316L-based alloys in an aggressive acid-brine environment (pH 4) were measured using potentiodynamic and potentiostatic methods. Different amounts of two Mo-rich intermetallic phases formed as Mo was added. Sigma phases having modest molybdenum contents (21-29 wt% Mo) formed in all the alloys and Laves phases with higher molybdenum contents (33-40 wt% Mo) formed in alloys made with more than 5 wt% Mo. Alloys with 15 wt% Mo or more showed poor corrosion resistance that is attributed to the abundant Laves phases. Detailed analyses of the corroded materials using SEM/EDS showed preferential corrosion of the Sigma and Laves phases (probably galvanic corrosion). Test results and their relevance to formulation and performance modeling of waste forms will be discussed.

221. Raja, Maryam

“I think they care, but they don’t show it:” Fifth Graders Speak Candidly about Perspectives and Perceptions of Teachers, Peers and the School Climate

Undergraduate - Curriculum & Instruction

This study examines student relations with their peers and teachers and how the school climate affects students' perceptions of school. At the heart of this study is the following research question: How are student perceptions of school formulated and altered through their interactions with their peers and educators? Interview data was collected from four fifth grade students in a split classroom. The students attend a predominantly Latino/a public school in Chicago, Illinois. Two separate interviews were conducted during the Fall of 2016 with each individual student. Students were inquired about interactions with students across grade levels, teacher support, peer support, rewards systems and bullying. The findings across the four interviewees reveal that students have mixed experiences with current and former teachers. Most notably, a few of the themes that emerge are that students see teachers as knowledgeable figures, find that their peers carry both social and academic value and perceive that certain issues, for instance, bullying can be mitigated only when an adult figure intervenes. The salience here is that often the student is blamed for disengagement from school, but on lesser occasions are the factors affecting them looked at. In order for students to learn academically, they must first be cared for and feel

connected to the members of the school community, which is why there is a reciprocal relationship between academic learning and perceptions of school culture. One cannot simply read a student based off of academic performance without examining how much support they are receiving from their teachers, their peers and most importantly, whether they feel valued as part of the larger school community.

222. Ramirez, Brendan

The Dodd-Frank Act: Corporate Governance Effects

Undergraduate - Accounting & Information Decision Sciences

The Dodd-Frank Act of 2010 was passed in reaction to the 2008 financial crisis. While the bulk of the Act covered financial regulations, it also provided a slew of new corporate governance guidelines. This legislation was intended to increase investor protection and promote economic stability by curbing managerial risk taking. This paper argues that Dodd-Frank's corporate governance provisions have succeeded in making company operations more transparent which, overall, has positively affected investors, and in turn, has strengthened the corporate governance of companies. Specifically, the three sections this study focuses on are: Section 951 say-on-pay voting, Section 953 executive pay disclosures, and Section 972 board of directors' qualifications and responsibilities disclosures. The say-on-pay voting and board disclosure rules have had enormously positive effects on companies' corporate governance concerns and have been well received by shareholders. The disclosure of the ratio relating a company's CEO compensation to its median employee compensation excluding the CEO's pay will start being reported by in 2018. This stipulation is likely to have a positive effect on corporate governance; however, the net effect of the on companies may be adverse. This may occur because high ratios are likely to incite employee and media backlash over perceived wage disparity and excessive compensation. To frame the context of Dodd-Frank and its corporate governance reforms this paper will begin with an overview of corporate governance, a review of prior corporate governance legislation via an analysis of the Enron Corporation, and a discussion of the role corporate governance played in the 2008 financial crisis. Next, the overall corporate governance provisions of Dodd-Frank are studied followed by a detailed discussion of SEC rules adopted with relation to Sections 951, 953, and 972. The paper concludes with a review of the arguments put forth and recommendations of areas for further research.

223. Ramirez, Cesar

Nociceptive Effects of Cannabinoids on the Developing Naked Mole-Rat

Undergraduate - Biological Sciences

The Naked Mole-Rat (*Heterocephalus glaber*, NMR) is a small, social rodent that is insensitive to chemical pain and tolerant to hypoxia. Interestingly, the mechanism

responsible for hypoxia tolerance is found in neonatal mammals. This suggests that NMR retain their neonatal characteristics throughout adulthood. Included in this neonatal retention is a large quantity of cannabinoid receptors, which are important in understanding the therapeutic effect of cannabis. We previously established that NMR do not demonstrate the impaired locomotion associated with cannabis consumption. Due to the retention of neonatal characteristics and their unusually abundant expression of cannabinoid receptors, NMR serve as the best model to understand cannabinoid effects on pain relief. The aim of this study is to characterize the nociceptive effects of cannabinoid agonist (WIN55) on NMR in an age-dependent manner. Therefore, a formalin assay was performed during different development periods: neonatal, adulthood, and older adulthood (6 MO, 1 YR, 5 YR). NMR (n=12) and mice (n=12) were administered WIN-55 (0.06mg/kg, or 0.12mg/kg) or 0.9% saline intraperitoneal 30-minutes prior to the experiment. Each animal received a 15-20 μ L of formalin subcutaneously into the dorsal hind paw. Time spent performing nociceptive behaviors (licking, biting, and lifting) of the formalin-injected foot were recorded in 5-minute intervals for 90-minutes. With no analgesic, mice demonstrate a normal decrease of pain behavior with age. NMR however, had a high pain response in neonatal and older adults but a decrease in adults. Moreover, we found that both NMR and mice have attenuation of nociceptive behavior under the effects of WIN at all stages of life. Ideally, therapies using cannabinoids would relieve symptoms without inducing euphoria. We see this in NMR response to cannabinoids and that, coupled with the ongoing studies of brain circuitry in the NMR, could reveal insight for designing more effective drugs and treatments for humans.

224. Razvi, Sharmeen and McGinley, Andrea

Acne and the Power of Antimicrobial Resistance

Undergraduate - Biological Sciences

Acne Vulgaris (Acne) is a skin condition caused by clogged skin pores. When sebum production is elevated, the populations of two species of bacteria become dysregulated within the pore, leading to an inflammatory response and lesions. Acne is the most common skin problem in the United States, affecting 40-50 million people from infancy to adulthood. The treatment for acne can include topical and oral antibiotics, topical creams, contraceptives, chemical skin peels, and laser work. The goal of this research study was to investigate whether common topical over-the-counter (OTC) and antibiotic treatments can cause antimicrobial resistance to develop. Antimicrobial resistance is a growing public health threat in which microorganisms adapt to resist treatments. We hypothesized that if acne bacteria are exposed to antimicrobials for prolonged periods, then antimicrobial resistance will occur. Prolonged exposure to treatments may promote resistance by allowing bacterial cells the opportunity to evolve mutations and reproduce. This research studied the major topical antibiotics and OTCs used for acne treatment to understand the role of bacterial resistance in the two predominant bacteria species linked to acne: *Propionibacterium acnes* (*P. acnes*) and *Staphylococcus epidermidis* (*S. epidermidis*). Our findings suggest that prolonged exposure of acne bacteria to some antimicrobials can induce resistance via selection for mutation against antimicrobial

sensitivity. *S. epidermidis* produces mutant colonies when exposed to erythromycin, but not clindamycin. The mutant strains have markedly reduced sensitivity to erythromycin. The *P. acnes* strain shows much greater sensitivity to both antibiotics and it has not given rise to any mutant strains. The OTC treatments salicylic acid and benzoyl peroxide do not promote resistance in either species. These results highlight the importance of exercising caution and monitoring potential resistance when using antibiotics for the treatment of acne.

225. Rebollar, Aletia

Discourse Sensitive Clitic--doubled Left Dislocations in Heritage Spanish

Undergraduate - Hispanic Linguistics

The purpose of this study is to determine whether or not heritage speakers of Spanish (HS) perform in a native-like manner at the syntax-discourse interface of Spanish Clitic-doubled Left Dislocations (CLLD). CLLD relates a dislocated constituent to a discourse antecedent ([+anaphor]), while clitic-less FF ([-anaphor]) does not. There is, therefore, a correlation between the presence/absence of clitic-doubling and the presence/absence of an anaphoric relation. The IH predicts that second language learners (L2ers) show divergence in performance because L2ers experience difficulties with the integrations of syntax and discourse modules in real time use. (Sorace, 2011) Moreover, Montrul and Polinsky (2011) consider that the predictions of the IH are also applicable to HS. Leal Mendez, Rothman, and Slabakova (2015) propose convergence from HS data taken from an acceptability judgment task (AJT). However, the authors acknowledge that a task that limits metalinguistic analysis could have shown the processing limitations predicted by the IH. Therefore, this study employs data from a speeded production task (Sequeros-Valle, Hoot, and Cabrelli Amaro (in progress), which limits metalinguistic analysis. The authors found that HS will perform similarly to native speakers at the discursive restrictions of CLLD, and these results challenge the IH.

226. Redfield, Janelle

Physical Activity and Personality Type

Undergraduate – Spanish

The purpose of this experiment is to determine which personality types correlate with exercise behaviors (frequency and intensity). I will give about 50 randomly selected participants a questionnaire that measures personality types by using the NEO Five-Factor personality assessment and that also measures exercise behavior by using an IPAQ survey. Based on previous research, it is hypothesized that those with a stronger personality in extraversion and neuroticism will be more likely to exercise more frequently and intensely. Those with a stronger personality in conscientiousness and agreeableness may exercise with a more moderate frequency and intensity. Those with the

stronger personality trait of openness to experience may be anywhere on the spectrum from low to moderate to high exercise frequency and behavior. This information is important because it can influence the way that exercise is advertised and marketed to different people. Instead of advertising one type of exercise, personal trainers and other health professionals that work in the exercise field can find different ways to promote exercise to different personalities. As a result, this can increase the amount of people willing to exercise and increase the overall health of many communities.

227. Reiman, Derek; Metwally, Ahmed and Dai, Yang

A Convolutional Neural Network Approach to Analysing Association of Microbiome and Phenotype

Graduate/Professional – Bioengineering

The microbiome of the gut has been linked to many diseases. A microbiome study is usually started with the characterization of the microbial community in an environmental/genomic sample using next generation sequencing (NGS) technologies in order to quantify abundance on a taxonomic level. The next step is to detect statistical associations between microbial taxa and phenotype. Alternative approaches based on predictive models have been proposed, however the difficulty in establishing these prediction models is the selection of features relative to the phenotypical response from a large number of microbial taxa. We propose a novel framework to analyze microbial taxonomic data for phenotype association using a Convolutional Neural Network (CNN). A CNN incorporates spatial information into the model and generates convolution layers with multiple feature maps. We take advantage of the CNN modeling approach to explore this structure by constructing a phylogenetic tree and embedding it into a matrix as the input for the model. However, the power of CNNs rest not only in their predictive power, but also in their innate ability for feature selection. By extracting the feature maps, we believe that it is possible to observe which parts of the phylogenetic tree are important and how they change between phenotypic classes. To demonstrate the utility of the proposed framework, we used a dataset containing 1967 samples taken from three different sites of the body (gut, skin, oral cavity) in the “Moving pictures of the human microbiome” project. Our model achieved an accuracy of 99.67% on the given dataset, which is highly competitive with other methods. With a trained and accurate model, we extracted the feature maps at various layers. Our analysis has shown that the samples of each phenotypic class share a similar microbial landscape based on the features captured by the CNN model.

228. Riley, Penelope; Olivares, Javier; Cerkoska, Simona; Teshome, Betlihem; Karis, Klas and Khalili- Araghi, Fatemeh

Thermal Transport Properties of Heterogeneous Two-Dimensional Materials

Undergraduate – Physics

Understanding the thermal properties of two-dimensional (2D) materials is critical towards nano-electronic device development. However, due to the small scale of such devices, fully understanding and determining the contribution of all components of such devices experimentally is not possible.

Computer simulations were used to simulate thermal transport across a single layer of molybdenum-disulfide (MoS₂) and various substrates and calculate thermal conductivity. This analysis details how well the material conducts heat, an essential property in various technological applications. Using the molecular dynamics program LAMMPS, we simulated thermal transport across a triple-stacked system consisting of a single layer of MoS₂ sandwiched between two substrates. On one side, we had a thick layer of titanium and the other side had a thick layer of silicone dioxide (SiO₂) or aluminum oxide (Al₂O₃). An equilibrium simulation was first run to stabilize this structure. After stabilization, a non-equilibrium simulation was run which defined hot and cold regions at the top and bottom of the system allowing the heat to flow from the hot to the cold region. By monitoring the heat flow over time (J) and the temperature gradient (ΔT) across the system (of cross-section A and length L), the thermal conductivity (k) was calculated ($k = J / (A \Delta T / L)$). Using the molecular visualization software VMD, we obtained a graphical visualization for each system and observed that it was running as expected. We also simulated simpler systems consisting of a single layer of MoS₂ and one substrate. The thermal conductance was then calculated across their interface. Our results show that adding a single layer of MoS₂ between two substrates reduces the thermal conductivity of the system by a factor of 5. Additionally, the boundary conductance of MoS₂ with each substrate is significantly higher in the triple-stacked system compared to those in the double-stacked systems.

229. Rivera, Elaine and Ragozzino, Michael

Effect of Prenatal Fluoxetine Exposure on Offspring in a Genetic Model of Autism

Undergraduate – Psychology

Autism spectrum disorders (ASD) is characterized by social impairments and repetitive behaviors with restricted interests. There has been a dramatic increase in prevalence of ASD in the past two decades and one hypothesis is that increase use of the selective serotonin reuptake inhibitors (SSRI) in pregnant women may contribute to elevated risk of an offspring having ASD. Serotonin is known to play a major role in brain development. At present, unknown is whether SSRI exposure alone or interacting with a condition such as depression increases the risk of an ASD-like phenotype in offspring. Further, unknown is how SSRI exposure in pregnant females already at risk of having offspring with ASD may affect the incidence and/or severity of the autistic phenotype. To begin addressing these gaps in knowledge, the present study examined the effect of prenatal SSRI exposure with fluoxetine in B6 mice (a typical mouse strain) and BTBR mice (an idiopathic model of autism). Pregnant female mice were administered fluoxetine from gestational period 8 to 18 (0.3 mg/kg/day). Offspring were tested as young adults (8 weeks of age) on self-

grooming behavior (stereotyped, repetitive behavior) and an elevated plus maze (measure of anxiety). Prenatal SSRI exposure had the opposite effects in B6 and BTBR mice on grooming behavior. Male and female B6 mice prenatally exposed to fluoxetine showed an increase in grooming compared to that of B6 mice exposed to vehicle injections. In contrast, Male and female BTBR mice prenatally exposed to fluoxetine showed a reduction in repetitive behavior compared to that of BTBR vehicle controls. One possibility is that prenatal SSRI exposure in B6 mice produces an excitation/inhibition imbalance in the brain, while it corrects an imbalance in BTBR mice that leads to distinct effects on grooming behavior.

230. Roby, Lauren; Gorman, Kevin and Kay, Brian

Generating Sandwich Assays via Phage Display

Undergraduate - Biological Sciences

Due to its inherent specificity and sensitivity, the sandwich assay is the gold standard in diagnostics and is the foundation for many biochemical assays. In this setup, one binding reagent is used to capture the analyte from a mixture, and another reagent is used for detection. Thus, the analyte is “sandwiched” between two binding reagents.

Unfortunately, finding pairs of reagents that work in this assay format is time-consuming and costly. To bridge this technology gap, the Kay lab has developed a technology termed MegaSTAR, which uses phage-display to rapidly identify pairs of affinity reagents that bind the same target simultaneously. Our group generated sandwich assays for the human protein rho GTPase-activating protein 32 (RICS). The goal of my project was to further characterize the output of the affinity selections for the aforementioned target and to use the analysis to design additional sandwich assays. I used Sanger sequencing to determine the sequence for 100 tandem clones that bind RICS. Then, using bioinformatics, I sorted the clones based on their amino acid sequence. Fifteen unique pairs were identified even though a small number of clones were sampled, thereby highlighting the robustness of the technique. Using sequencing data, we predicted and confirmed the combination of tandem clones for two successful sandwich assays.

231. Rodas, Irma; Ruiz, Anthony; Alonso, Angelica; Craven, Meredith; Calderon, Leonilda; Nava, Magdalena; Dykema-Engblade, Amanda; Rademaker, Alfred and Sanchez-Johnsen, Lisa

Latino Obesity and Cancer Health Equity Scholars: Trainee Involvement and Opportunities to Conduct Obesity and Cancer Health Equity Research

Undergraduate – Psychiatry

Introduction. The Chicago Cancer Health Equity Collaborative (ChicagoCHEC), a National Cancer Institute-funded grant (U54CA202995, U54CA202997 and U54CA203000), is a collaboration between the University of Illinois at Chicago (UIC),

Northeastern Illinois University (NEIU) and Northwestern University (NU) to address cancer health equity. ChicagoCHEC funded a one-year grant, Community-Engaged Obesity Intervention Development for Puerto Rican and Mexican Men, to UIC, NEIU, NU and the Puerto Rican Cultural Center. One goal of the grant was to provide training/professional development opportunities to university students and community trainees, who are called Latino Obesity and Cancer Health Equity Scholars. The aims of this presentation are to describe the training/professional development opportunities and share the perspectives of various trainees. Methods. Graduate students (n=2) were selected based on their professional interests. Undergraduates (n=2) and community trainees (n=2) responded to advertisements offering training/ professional development opportunities in obesity/cancer prevention research. Results. Depending on their training level, the Scholars have been provided with these training opportunities: how to conduct community engaged and cancer-related health equity research; how to provide research support for Latino health studies; attending obesity/smoking seminars; preparing for/attending team meetings; participating in IRB submissions and grant preparation; and developing research proposals. The following professional development opportunities will continue to be provided: learning how to use referencing software; managing IRB submissions; networking with others across universities/community organizations; developing conference presentations; attending/co-presenting at seminars/conferences/symposium; and manuscript writing (for graduate students). In terms of trainee perspectives, for undergraduates, the focus is on learning research assistantship duties. For graduate students, the focus is on developing and analyzing data for their Master's theses. Community-level trainees will continue to gain knowledge about obesity and cancer prevention among Latinos and share their perspectives about community-engagement. Conclusion. Trainees will continue to develop research skills and will be provided with opportunities to enhance their professional goals in Latino obesity.

232. Rosario, Keren

Is Fortification the Answer

Undergraduate – LAS

This study explores the concept of fortification in foods, and asks specifically whether fortified foods can present a viable solution to the nutrition issues faced by children and adults across the nation. Through a meta-analysis of existing literature the past history of fortification is provided, with details from its initial usage and leading to how foods are currently being fortified. Fortified foods are compared to natural sources of nutrients, and clinical trials are presented along with the outcomes of these trials. I hypothesize that fortified foods present a practical and implementable solution to nutrition deficits in the U.S. Bio-availability is discussed, both in terms of fortified foods and nutrients occurring naturally in foods. In addition data is collected and presented on the steps involved in the processing of various foods and what nutrients are removed or lost throughout, as well as on the current nutritional issues facing the nation. Materials reviewed include peer reviewed journals, statistics and research, government websites such as FDA.gov,

Agriculture.gov, USDA.gov, the Center for Disease Control, and the NIH among others, as well as Nutrition databases such as Agricola.

233. Sahagun, Joseph; Cortez, Vanessa; Espino, Carmen; Rivera, Bernardo and Wink, Donald

Expansion of a Simple Fluorescent Sensor: Glass Surface Modification Method

Undergraduate – Chemistry

In today's society biosensors have become a huge component in various fields such as analytical chemistry, biochemistry and the medical field. These fluorescent sensors serve as markers and aide in refining the future of research through its massive potential. The broad application of these sensors, particularly fluorescent ones, have been developed and refined throughout the years. As the field continues to develop, the availability of classroom models has not. The sensor model was based off the CASPiE Module developed by Ivanisevic et al. The fluorescent compounds studied were dansyl chloride, coumarin-6-sulfonyl chloride, rhodamine isothiocyanate (RITC), or fluorescein isothiocyanate (FITC). An optimal ratio of organic silanes was determined to obtain the optimal fluorescence emission from each fluorescent compound for both slides and test tubes. It was determined that the optimal ratio of (3-aminopropyl) trimethoxysilane (APTMS) to propyltrimethoxysilane (PTMS) was a 1:3 for dansyl chloride. The fluorescent labeled test tubes were then quenched using a variety of solvents or cyclodextrin in order to determine which chemicals were effective. For each fluorescent tag, the ratio of silanes that gave optimal fluorescence, as well as the solvent that effectively quenched it were recorded. When comparing the results between the various fluorescent tags, it was determined that any silane used prior when paired with PTMS in a 1:1 ratio yielded the optimal fluorescence. The dansyl chloride fluorescent biosensor model has been expanded to include coumarin-6-sulfonyl chloride, RITC and FITC variations. Although, further analysis of the RITC model is required in order optimize the application of it on both the slide and test tube.

234. Saifuddin, Hamza; Martinez, Jenny and Mohr, Justin

Cu-Catalyzed γ -Alkylation of Enones using Dihalocarbonyl Synthons

Undergraduate – Chemistry

The synthesis of 1,6-dicarbonyl compounds has been a long-standing problem and significantly more challenging than the syntheses of 1,3-, 1,4-, and 1,5- dicarbonyl compounds. To resolve this issue, our group recently reported a γ -alkylation protocol that involved the use of dienol ether derivatives of readily available cyclic enones along with a Cu catalyst to directly form a γ -C – C bond.¹ This project focuses on using two different dihalo carbonyl compounds, ethyl trichloroacetate and ethyl bromodifluoro acetate, to study the synthesis of dihalogen derivatives of 1,6-dicarbonyl molecules. Not only does this ease the process of generating a γ -C – C bond, but also provides an efficient method

that can be applied to the synthesis of various other complex molecules, especially within medicinal chemistry. Using copper(II) triflate as a catalyst, the reaction was run along with sodium bicarbonate (base) and pentamethyldiethylenetriamine (ligand) on many different dienol ether derivatives of enones at a temperature of 80 °C for about 22 hours. The products were then purified using column chromatography and analyzed using nuclear magnetic resonance spectroscopy. The reaction had varying success depending on the type of dienol ether molecule used, the details of which are being presented.
References: (1) Chen, X., Liu, X., & Mohr, J. T. Cu-Catalyzed Stereoselective γ -Alkylation of Enones J. Am. Chem. Soc. 2016, 138, 6364-6367.

235. Saini, Ravisha; Kyzar J., Evan; Krishnan R., Harish; Zhang, Huaibo and Pandey C., Subhash

Effects of Chronic Ethanol Exposure and Withdrawal on mRNA Expression Profiling of Histone Methyltransferase and Demethylase in the Amygdala of Rats

Undergraduate – Psychiatry

Alcoholism is a serious public health risk and contributes to other psychiatric disorders such as anxiety. Epigenetics is defined as modifications to DNA and histones that cause changes in gene expression without changing the genetic code. Epigenetic processes such as histone acetylation and histone methylation are implicated in alcohol use disorders. We investigated the role of histone demethylases and histone methyltransferases in the effects of chronic ethanol exposure in the amygdala, a brain structure that is crucial for anxiety. Male Sprague-Dawley rats were treated with Lieber-DeCarli ethanol diet or control diet for 15 days, and ethanol-fed rats were withdrawn for either 0 (ethanol group) or 24 hr (withdrawal group). Our results showed that the histone demethylases specific for the repressive epigenetic mark histone H3 lysine 27 trimethylation (H3K27me3), Kdm6a and Kdm6b, showed no significant changes in the amygdala between the control, ethanol, and withdrawal groups. We then examined changes in mRNA levels of the histone methyltransferases Ezh2 and Suz12 (specific for H3K27), and G9a, a methyltransferase that specifically adds methyl groups to H3K9. There were no significant changes in Ezh2 and Suz12, but G9a showed a significant increase in the ethanol group when compared to control rats. These results indicate that chronic alcohol exposure alters specific epigenetic pathways within the amygdala. Future studies will investigate other epigenetic effectors and histone methylation and identify downstream genes that may provide new treatment targets for alcohol addiction (Supported by grants from NIH-NIAAA and Department of Veterans Affairs to SCP).

236. Sakharkar, Saheel

Query Security in Popular Database Texts

Undergraduate - Computer Science

There is no shortage of literature in computer science about databases. Our goal is to take a look at the most popular computer science literature related to databases which are used in a teaching environment. We aim to find out how accurately these texts describe working with databases as compared to working databases in the real world. Primarily, we target whether these texts are properly teaching database security.

237. Salzman, Ryan; Valencia, Ana; Balu, Deebika; Collins, Nicole and LaDu, Mary Jo

Alzheimer's Disease Pathology is caused by Soluble A β Peptide, not Amyloid Plaques

Undergraduate - Anatomy and Cell Biology

Alzheimer's disease (AD) is the 6th leading cause of death in the United States. Currently, there is no cure and existing treatments are temporary and palliative. Age is the greatest risk factor, while the presence of the *APOE4* allele increases AD risk compared to *APOE3*, and *APOE2* is protective but rare. *APOE* encodes for apoE, the protein part of fat (lipid) particles in the brain. *APOE4* is associated with increased amyloid-beta peptide accumulation, both as amyloid plaques and soluble oligomeric forms of A β . While amyloid plaques may be benign, the soluble oligomeric forms are considered a proximal neurotoxin. Understanding the interactive effects that *APOE* genotype and age have on AD pathology has been limited by the lack of mouse models that express human *APOE* genotypes. Using EFAD mice, a novel, tractable human-*APOE*/familial AD-transgenic (FAD-Tg) preclinical mouse model, we have developed the mechanistic hypothesis that risk factors associated with AD pathology: *APOE4* and age cause a reduction in apoE lipidation, resulting in inefficient clearance of soluble A β , synaptic loss, and behavioral impairment. By 6-months (M), E4FAD mice have greater behavioral impairment, AD pathology, and lower apoE lipidation levels compared to E3FAD and E2FAD. However, EFAD mice have not been analyzed beyond 6M. As the greatest risk factor for AD is age, aged EFAD mice address both these critical risk factors: age and *APOE4*. In this study, at 6, 10, 14 and 18M, we measured amyloid deposition as well as soluble A β species. (1) A β deposition as plaques continues with age with E4FAD > E3FAD with regional and age-dependent changes in plaque morphology. (2) While the levels of soluble A β 42 plateaued at 10M in E4FAD and 14M in E3FAD and E2FAD mice, oA β levels continued to increase from 6-18M with E4FAD > E3FAD > E2FAD.

238. Samadi, Schaudieh

Components of Health Resilience: Understanding Factors for Resilient Communities in Urban Settings

Undergraduate – Physics

A resilient community is one that is able to sustain itself through the use of existing available sources in order to overcome socio-economic and environmental challenges.

With the increasing need for access to healthcare resources and services in urban communities, understanding key components of health resilience in relation to other important factors of sustainability: economic factors, cultural vitality, social equity, and environmental responsibility offer insight into how present-day communities can potentially structure themselves to deal with increasing populations in urban areas while being mindful of valuable resources. In order to identify key components of health resilience in communities such as Pilsen Little Village in Chicago, it helps to understand the roles of the healthcare system and community representatives towards developing the appropriate goals and designs that lead to sustainable urban communities. The participants in this study include healthcare professionals from the UI Pilsen Healthcare Center Lower West and community representatives from Pilsen Little Village. The participants were interviewed and filled handouts referring to a given framework of healthy, resilient communities. Thorough content analysis revealed the need for improving social connectedness between the healthcare center and community representatives in order to maximize support for the health and well-being of the residents of the community. Key components of health resilience were narrowed-down and compared to the components of traditional examples of community health resilience in order to identify best practices for overall sustainable and resilient community health. This information helps translate into the other factors of sustainability in making recommendations for defining resilient communities of the future.

239. Sanad, Lena; Oludare, Simisola and Grabiner, Mark

Effects of Increased Difficulty of an Attention-Demanding Task on Step Width and Step Width Variability During Treadmill Walking

Undergraduate - Kinesiology and Nutrition

Background: Walking is a complex motor function, the performance of which may be thought of as occurring automatically. However, walking is an attention-demanding task. Performing an attention-demanding task while walking can degrade the quality of walking. For example, balance during walking, stability, can be degraded by the simultaneous performance of an attention-demanding task. Step width and step width variability are measures that have been associated with walking stability.

The purpose of this study was to determine the effects of a cognitively demanding task on step width and step width variability during treadmill walking and to determine whether the effects were proportional to increased difficulty of the same task. We hypothesized that a cognitive task performed while walking will result in an increase in step width and step width variability. We also hypothesized that increase in step width and step width variability will scale the difficulty of the cognitive task. Methods: To test our hypotheses, four healthy young adults walked for 10 minutes on a treadmill under three conditions. The first served as the control walking condition. During the second and third conditions, the subjects walked while performing an attention demanding arithmetic task (dual task). The attention-demanding task was the same for each condition but the level of difficulty of the task was increased in the second condition. Motion capture was used to collect three dimensional kinematic data from which step width and step width variability were

computed. Paired t-tests were used to determine the significance of differences between dependent variables during the dual task conditions. Significance was determined using the criterion of $p < 0.05$. Results: The increase in difficulty of the attention-demanding task increased step width by 11 percent ($p = 0.036$). Step width variability decreased by 2 percent ($p > 0.05$). Discussion: The increase in step width while performing the more difficult of the two attention-demanding tasks is consistent with findings of previously published research. However, the significant increase in step width while performing the more difficult of the two, otherwise identical attention-demanding tasks, is novel. In light of the relationship between step width and side-to-side balance while walking, the results of this study preliminarily suggest that these novel findings warrant more systematic study.

240. Sanchez, Danielle

Renovation of Chem 130

Undergraduate – Chemistry

Chem 130: Survey of Organic and Biochemistry is a course required for students who wish to pursue a future in nursing. It is centered around organic structures relevant to life sciences, and provides an introduction to the basis of biochemistry, including learning about structure and function of proteins, nucleic acids, carbohydrates and lipids. Students are able to utilize what they learn in lecture by performing guided experiments in the laboratory aspect of this course. With the help of Dr. Clark, the coordinator of this course, we were able to incorporate two new and improved experiments into the syllabus of this course, which are designed to improve students understanding about the process behind urinalysis and the chemistry of carbohydrates. These two labs, which were performed by the Spring 2017 Chem 130 students for the first time, were then observed, and their abilities to complete and understand the experiments were recorded. We hope to see a positive adjustment in these students' lab report scores and ultimately exams involving these aspects of organic and biochemistry. We also hope to continue to implement these new experiments into the future of Chem 130.

241. Santillan, Jessica and Papanikolla, Johanna

Clay Sourcing and Iconographic Interpretations of Twin Maya Urns

Undergraduate – Anthropology

There are two nearly identical Maya incensarios in existence; however, they are currently located in two completely different places: Albion College, Michigan and the Museo de los Altos, San Cristobal de las Casas in Chiapas, Mexico. Both of the urns show the same image: a deity emerging from the Maya mountain zoomorph (called Cauac) and appear to be similar in measurements. In order to determine if the urns are authentic and clones, researchers traveled to Michigan and Mexico to collect samples through the process of

drilling and flaking. Additionally, measurements from both urns as well as photographs were taken. So far in the data analysis, the urns appear to depict the Maya God L/Earth Lord and are nearly identical in measurements. An early conclusion could suggest that both urns are authentic and constructed by the same artist.

242. Sarkisian, Alexandra

The Relationship between Time Spent in Food Preparation and Body Mass Index among Latino and African American Parents

Undergraduate - Kinesiology and Nutrition

Cooking meals at home allows for more control over the amount of calories, fat, and sugar in one's diet. Frequently consuming home-cooked meals can be an important factor in preventing obesity among the adult population. The purpose of this study is to examine if there is an association between the amount of hours per week spent preparing food and body mass index (BMI). Data was collected from the Study on Children's Home Food Availability using TechNology (SCAN) on 97 African American and Hispanic parent/caregiver-child dyads. To assess food preparation, parents were asked, "How many hours per week do you normally spend preparing food for your family?" Trained staff also measured the heights and weights for parents at the first visit to assess BMI. BMI was calculated as weight (kg)/[height (m)]², and a BMI $\geq 30\text{kg}/\text{m}^2$ for adults indicated that they were obese. To assess the relationship between parent BMI and time spent in food preparation, we estimated the correlation between the adults' BMI and reported amount of time spent preparing food per week using Pearson's correlation. In this sample, the average time spent cooking was 10.4 hours per week (8.2 hours/week and 12.3 hours/week for African American and Hispanic households, respectively). The average BMI was $31.4\text{ kg}/\text{m}^2$ and 48.5% of parents were obese. The main analysis estimated a weak correlation ($r= 0.095$) suggesting that there is no apparent linear relationship between hours spent preparing food per week and BMI. These findings suggest that the amount of time spent cooking per week does not appear to be related to BMI. Future studies should evaluate other indicators of health such as diet quality in relation to food preparation time.

243. **Withdrawal**

244. Schulte, Andrew

Reconstructing the Crocodile Mimic: Differentiating Suchomimus tenerensis from Other Spinosaurids Through Skeletal Reconstruction and Animation

Graduate/Professional - Biomedical Visualization

The use of 3-dimensional models in the dissemination of paleontological discoveries is becoming ever more important in the promotion of spatial understanding of fossil morphology and phylogeny by paleontologists, students, and the interested public. In 1998, paleontologist Dr. Paul Sereno was the head of a team that uncovered a new species of crocodylian theropod named Suchomimus tenerensis. It exhibited features such as an articulated snout of remarkably long, low, and narrow proportions¹ and a pincerlike terminal rosette, containing the largest teeth in the skull. Throughout the course of this research, a complete digital reconstruction of Suchomimus tenerensis is being created from CT scanned data of its fossilized remains. The resulting 3D models of these specimens are the subject of a narrated animation emphasizing the key morphology differentiating Suchomimus from other Spinosaurids. It is the aim of this project to further test the use of advanced scanning, segmentation and 3D modeling/animation software to produce accurate, comprehensive, and dynamic visualizations of paleontological discoveries. While the results of this research can be assessed in terms of its role in paleontology, the proposed enhancement of visualized bone data is applicable to many other fields of scientific research. The ability to address questions of organismal morphology, function, and evolution using digital models is far-reaching and valuable throughout the scientific community. This research seeks to determine how accurate and efficient these models can be and to which degree contemporary visualization techniques benefit fields of scientific research. The target audience to be addressed is primarily the paleontological community, specifically those conducting research on the family of Spinosauridae. However, it is likely that this visualization will be displayed on the UofC's Fossil Lab website which is intended to describe their findings to the general public.

245. Scott, Haley; Tess Tyton and Craig Horswill

Workstation Energy Expenditure: Effects of the Hovr' and Cognitive Function

Graduate/Professional - Kinesiology and Nutrition

Background: Prolonged sitting is associated with cardiovascular disease, metabolic syndrome, and increased risk of mortality. Facilitating increased energy expenditure into the workday may help desk-bound individuals reduce these risks. Alternative workstations may increase energy expenditure; however, some efforts that significantly elevate metabolism (treadmill walking) may distract from and diminish work productivity or vice versa: cognitive effort may reduce spontaneous movement. Purpose: The purpose of this study was to compare metabolic rate and cognitive function while sitting, sitting using an alternative workstation device (Hovr®), and standing while doing a cognitive task. Previously we found a 17% elevation in metabolism with Hovr' use compared to that of sitting. Methods: Participants included 24 individuals (12 males and 12 females; age 23.42 ± 5.90 y; height 170.61 ± 10.41 cm; weight 73.57 ± 19.48 kg). The study consisted of randomized order for sitting, sitting using the Hovr', and standing workstations. Metabolic rate (VO₂) and cognitive function using tests of variable attention (TOVA) were measured. TOVA lasted ~22 minutes so VO₂ measurements were made continuously and evaluations were divided into quarters based on the TOVA testing summary. Statistical analysis was done using two-way ANOVA with repeated measures

($p<0.05$). Results: Physiological data by quarter is as follows (Sit, Hovr', Stand, respectively): Q1 VO₂ (L/min): 0.285 ± 0.066 , 0.327 ± 0.093 , 0.295 ± 0.084 ; Q2 VO₂ (L/min): 0.282 ± 0.064 , 0.312 ± 0.086 , 0.294 ± 0.083 ; Q3 VO₂ (L/min): 0.286 ± 0.065 , 0.320 ± 0.088 , 0.298 ± 0.085 ; Q4 VO₂ (L/min): 0.283 ± 0.067 , 0.317 ± 0.086 , 0.298 ± 0.089 . For VO₂, a main effect was found for time (Q1, Q2 > Q2, Q4, $p<0.050$) but no workstation effect or interaction. For TOVA, time effects were found: decreased response time, increased response time variability; however, commission errors and omissions errors did not differ for quarter, workstation, or interaction. Conclusion: Although the metabolic data suggested an elevated rate when using the Hovr' vs. sitting (11.5%), the difference was not significant. The lack of change in error rate with a change in response times and variability of response times suggest when attention to cognitive work demands more effort, the ability to continued spontaneous physical activity (moving the Hov'r) may diminish.

246. Shah, Aayush

Investigation of the Long Term Effects of Youth Mentoring on Health During Adulthood

Undergraduate - Kinesiology and Nutrition

Background: Mentoring programs for youth show effectiveness for short-term improvements in outcomes such as academics and risk behavior. Understanding of their potential for facilitating improvements in physical health as well as whether benefits extend into adulthood, however, is limited.

Objective: This study investigated effects of participation in the Big Brothers Big Sisters of America (BBBSA) community-based mentoring (CBM) program on physical health outcomes in adulthood. Secondary analyses investigated whether any such effects were mediated by educational attainment and/or moderated by parent education and income levels. Method: 250 of 1,136 participants in a randomized control trial of the BBBSA CBM program conducted in the early 1990s were surveyed approximately 20 years later. Measures included current BMI, physical activity, diet (consumption of fast food), perceived physical health, and educational attainment. Participants who reported having had a Big Brother or Big Sister in the program were considered to have been mentored. Multivariable regression analyses were conducted to address study aims.

Results: Receipt of mentoring was a significant predictor of exercising greater days/week in adulthood. However, mentoring was not associated with other physical health outcomes

Conclusion: A community-based mentoring program showed evidence of a favorable influence on exercise during adulthood but not on other healthy lifestyle behavior (diet) or measures of health status. Future research should consider effects of other types of mentoring programs on adult physical health outcomes (e.g., programs that incorporate physical activity) as well as other pathways through which mentoring may influence such outcomes (e.g., type of occupation in adulthood).

247. Shea, Karen; Riel, Jeremy; Lawless, Kimberly and Brown, Scott

Teacher Challenges in Problem-Based Learning Curriculum Implementation

Undergraduate - Educational Psychology

This project examines challenges teachers face in the classroom in the enactment of a problem-based learning curriculum. Specifically, the study investigates differences between veteran and novice teachers in the challenges faced when implementing new curricula. The study followed 42 middle school teachers implementing a new blended learning curriculum. Weekly journals reflecting on their teaching and lessons were examined. A qualitative coding scheme was applied to teacher interview data from an implementation of a problem-based curriculum. Following coding, inductive analysis was performed , generating categories of challenges expressed by teachers in reflective journals. Additional comparisons of category type, composition, and influencing factors examined differences between the veteran and novice groups. The analysis has shown that novice teachers experience challenges at a higher rate than veteran teachers and that novices frequently encounter unique types of challenges.

248. Sheets, Zoie; Tipton, Alycia; Segura-Moye, Laura and Pradhan, Amynah

Epigenetic Modulation of Chronic Migraine

Undergraduate – Psychiatry

Chronic migraine is a highly-debilitating chronic pain disorder, which affects approximately 1% of the world's population. The mechanisms regulating the movement of migraine from an acute to a chronic condition are not well understood, despite the wide impact of this disorder. Epigenetic regulation of gene expression has become well-established as a modulator of other chronic pain conditions, including neuropathic pain and emotional disorders such as depression and anxiety. The aim of this study was to determine the role of epigenetic modulation in chronic migraine, with a focus on histone deacetylase (HDAC) and DNA methyltransferase (DNMT1) inhibitors. Chronic intermittent treatment with the known human migraine trigger nitroglycerin (NTG) has been shown previously to induce a chronic migraine-associated pain in mice. Male and female mice were treated with control/vehicle or NTG every 48 hours and pain thresholds were measured via manual von Frey hair stimulation. NTG produced significant acute and chronic migraine-associated hyperalgesia. 24 hours following the final injection of NTG or VEH (day 10), baselines were determined and mice were injected with the HDAC inhibitor trichostatin A (TSA). The experiment was repeated with a DNMT1 inhibitor, 5-azacytidine (5AC). Both the TSA and 5AC inhibited the hyperalgesia induced by chronic NTG treatment. These initial behavioral experiments were repeated, replacing NTG with VL-102. This drug is known to target specific pathways and provided insight into what particular neural pathway may be involved. VL-102 produced the same chronic-migraine associated pain as seen with NTG, and TSA also inhibited this hyperalgesia. All of these results indicate that upregulation of both histone deacetylase and DNA methyltransferase

may be mechanisms by which migraine becomes a chronic condition. Finally, to further characterize this epigenetic modulation, ELISA assays were performed on tissue collected from the trigeminal ganglia of both NTG and VEH mice. NTG mice were found to have twice the percentage of methylated DNA than VEH mice had, also indicating that this aforementioned upregulation plays a role in the transition of chronic migraine from acute to chronic.

249. Siddiqui, Hafsa

Social and Emotional Learning in Middle School

Undergraduate – Education

My capstone presentation is centered around social and emotional learning for middle school students. During my time as a student teacher in a middle school Humanities classroom at Lovett Elementary, I was able to see implementation and effects of social-emotional learning. By incorporating morning meetings and peace circles, students were provided healthy and productive outlets for channeling their social and emotional issues. I started my research at the beginning of the 2016-2017 school year by giving students a survey that addressed the way they deal with issues in their life. As a follow up, after 7 months of implementing social and emotional learning, I provided students with the same survey and observed the difference social and emotional learning could have on student behavior and learning. Students showed growth in areas of social interactions with their peers as well as gains in implementing various methods of dealing with emotional stressors.

250. Sidorowych, Christina; Lebowicz, Leah; Daugherty, John; Brennan, Kevin; Bond, Sam; Cotanche, Douglas and Ross, Callum

Visualizing Human Embryonic Development of the Heart's Outflow Tract

Graduate/Professional - Biomedical and Health Information Sciences

Human embryology provides a logical basis for understanding the overall organization of the human body and offers students the scientific basis for understanding mechanisms underlying both normal and abnormal development. The development of the human heart is one of the most complex processes to study in embryology. The heart is undergoing complex folding and various views and angles are needed to visualize this, making it very difficult to comprehend and learn the developmental process. Visualizing the 3-dimensional changes that include complex twisting and folding during the heart's outflow tract development is especially difficult. This long complex development is very important in understanding comparative human adult anatomy. The fundamental intellectual reason for studying embryology is to understand how our bodies came into being¹. Currently, there are many 2-dimensional illustrations depicting the embryonic development of the heart. However, students struggle to comprehend the various views

and angles of the heart with only 2D illustrations. A central challenge for teachers of human embryology is how to convey to their students the essential picture of the molecular control of development without overwhelming them with details. With the collaboration of both content experts, anatomy professor Dr. Callum Ross from the University of Chicago and anatomy professor Dr. Douglas Cotanche from the University of Illinois at Chicago, this research project will develop a 3D interactive program. This project will investigate how to best visually communicate the formation of the heart's outflow tract in a concise and efficient manner. Interactives have been shown to significantly advance the quality and effectiveness of learning environments for students. This interactive tool will depict the twisting and folding of the heart's outflow tract development, in addition users will be able to rotate the object in a 3-dimensional interface. Modes and tools in the application will allow students to explore the heart's outflow tract through various cross sections and control the animation of the heart developing. Testing before and after use of the 3D interactive tool, will evaluate medical student's knowledge on heart development and visual spatial relationships. Results of this project will provide evidence on the effectiveness of three-dimensional interactive visual learning tools for the education of medical students.

251. Simon, Alexander and Meyer-Dombard, D'Arcy

Identifying and Characterizing Iron Cycling Microbes from the Zambales Ophiolite

Undergraduate - Earth and Environmental Sciences

Evidence from previous studies suggests that members of the subsurface microbial community have the capability to reduce iron both aerobically and anaerobically in ophiolite-hosted ecosystems. These ecosystems occur where mafic and ultramafic rock that typically form at great depths are exposed near the surface. Exposure to surface conditions cause rapid chemical changes to the exposed rock surface, creating the unique environment characterized as a serpentinizing system. Soils that form in serpentinizing areas are enriched in metals like Fe, Cr, Ni, and Cu.

Samples from serpentinizing systems found in the Zambales ophiolite in the Philippines were obtained in 2013. Previous work has suggested the iron reducing capabilities of members of this microbial community in both aerobic and anaerobic conditions. The purpose of this project was to identify which microbe or microbes in this community were responsible for reducing iron, and to further characterize this microbe. By means of a serial dilution, the aerobic member of this community responsible for iron reduction was isolated. DNA was extracted and sequenced, and revealed that the isolate is a previously uncultured strain of [Tissierella sp.], which has been suspected of reducing iron in other ecosystems (Fuller et al., 2013). The next phase (which is ongoing) tests and measures various properties to further characterize this microbe. Samples were taken daily over a two week period to measure the rate of growth of the microbe. Additionally, the isolate's ability to grow in a simple growth media at different pHs is currently being measured. Finally, evidence from previous work suggests that members of the core microbial community characteristic to serpentinizing systems have the capability of processing other

toxic metals in addition to iron. The isolate's ability to grow in varying high concentration Cr, Ni, and Cu solutions is currently being measured as well.

252. Sin, Alexander and Polikanov, Yury

Unraveling the Mechanism of Ribosome Inhibition by Hibernation Factor SRA

Undergraduate - Biological Sciences

Ribosome hibernation is a process by which bacteria slow down their protein synthesis in order to cope with stressful conditions. This process utilizes several proteins which bind to the host's ribosomes, disable them and in some cases cause ribosome dimerization. These proteins have been labeled as hibernation factors. While antibiotics are especially effective at shutting down active ribosomes, they have no effect on inactivated ones, therefore providing a potential mechanism by which bacteria can easily become resistant to an antibiotic. Investigating the link between ribosome hibernation and acquisition of drug resistance in pathogenic bacteria can help with providing a way to prevent bacteria from developing multi-drug resistance.

One of hibernation factors, Stationary-phase-induced Ribosome-Associated protein (SRA), was originally thought to be a ribosomal protein, until a study revealed its stoichiometric ratio to the ribosome not only to be much lower, but also changing during bacterial cell cycle (Izutsu et al. 2001). This protein is mainly expressed during stationary phase and, hence, it was classified as a hibernation factor. This lead to a hypothesis that SRA is involved in various molecular mechanisms associated with stationary phase ribosome. The purpose of this project is to obtain a structure of SRA in complex with a 70S ribosome from bacterium *Thermus thermophilus* by using X-ray crystallography techniques. Currently, materials have been prepared for further work. The protein was overexpressed in *E.coli* cells, and purified using methods of His-tag affinity and size-exclusion chromatography approaches. The protein has been isolated and purified for future crystal formation. 200 ul of 2 g/L protein solution was obtained from 6 L of cells in media. The pureness and concentration of protein in the final solution has been analyzed with SDS-PAGE and BCA Assay respectively. These results will be further used to obtain structure of SRA-ribosome functional complex using crystallography.

253. Singh, Mandip and Gemeinhart, Richard

Do Micelles Remain Intact When in Fibrin Gels?

Undergraduate - Biological Sciences

For superficial ocular injuries, eye drops have been used but are limited by the short amount of time the drops remain in the eye. As soon as a person blinks their eyes, the medication will be drained from the cornea. However, deeper wounds require the therapy to be in a local area for an extended amount of time and extended release of therapeutic molecules. Proteins and exosomes derived from growing mesenchymal stems cells, bone

marrow stem cells, and adipose stem cells have been shown to augment wound healing, but cannot be retained on the surface of the eye (Soleimannejada *et al.*, 2017). In the proposed research, we will examine methods to treat deep injuries using fibrin gel, an FDA approved material for ocular surgery. It was hypothesized that micelles, which have similar characteristics to exosomes, would remain intact in the fibrin gels produced for a period of four to five days. Micelles could potentially hold medication in their hydrophobic core. That would allow for slow release of medication compared to eye drops, which release the respective medication within a couple seconds. In the experiment conducted, pyrene was used as a dye, which placed into the micelles. The pyrene was used as a representation of a medication that could be loaded into the micelles. These micelles were then placed into fibrin gels to observe whether release of pyrene was being seen. The release was measured in release media at specific time points using the process of fluorescence spectroscopy. The measurements indicated that the pyrene was being released into the fibrin gels, as the micelles should be released over at least hours compared to the seconds that the drops would be present.

254. Soppet, Savannah Colla MD, Joseph; Kotini-Shah MD, Pavitra; Soppet, Savannah; Molokie MD, Robert; Chen PhD, Yi-Fan and Prendergast MD, Heather.

The Use of Bedside Ultrasound as a Predictive Tool for Acute Chest Syndrome in Sickle Cell Patients: A Prospective Exploratory Study

Undergraduate - Emergency Medicine

OBJECTIVE: Investigate the use of bedside lung ultrasound (BLU) in identification of early pulmonary findings associated with acute chest syndrome (ACS) in adult sickle cell disease (SCD) patients **METHODS:** Prospective, observational study of a convenience sample of SCD patients presenting to the Emergency Department (ED) for a pain crisis between June 2016 and July 2016. Lung ultrasound was performed using low frequency curvilinear probe for GE vivid q. Six anterior and six posterior lung fields were recorded on each patient. Additionally, right and left upper quadrants were recorded for pleural effusion. BLU interpretations were made by an emergency physician blinded to the diagnosis of ACS, and were validated by a second reviewer. The electronic medical record was reviewed at discharge and at 30 days. **RESULTS:** Twenty SCD patients were enrolled. Median age was 31 years; median hemoglobin was 7.7g/dl. Six patients developed ACS. Five patients in the ACS group had lung consolidations on BLU (83%) compared to 3 patients in the non-ACS group (21%), $p = 0.0181$, (OR=18.33, 95% CI 1.51 to 222.87). The ACS group was also more likely to have pleural effusion and B-lines on BLU than the non-ACS group, $p = 0.0175$; 0.1657, respectively. In the ACS group, BLU was more sensitive than initial CXR at identifying lung consolidations (83% vs. 17%) and it was 100% sensitive at identifying patients who developed ACS within 48 hours of presentation, BLU identified positive lung findings sooner than CXR (median of 3.6 vs 31.8 hours). **CONCLUSIONS:** Pulmonary consolidation or pleural effusion on BLU of an adult SCD patient presenting to the ED for painful crisis highly suggests that

the patient will develop ACS. Pulmonary abnormalities of ACS appear on BLU before CXR. BLU is a promising predictive tool for ACS.

255. Sorokina, Lioudmila; Lin, Christine and Khetani, Salman

Decellularized Liver Extracellular Matrix for Long-Term Culture of Primary Human Hepatocytes

Undergraduate – Bioengineering

Primary human hepatocytes (PHHs) are valuable for applications such as modeling human liver diseases, cell-based therapies, and drug screening due to the inherent differences between animal and human liver pathways. Maintaining pure PHH monolayers is challenging in culture formats that rely solely on extracellular matrices (ECM) derived from non-liver sources, such as rat tail collagen I. Moreover, a varied and complex ECM microenvironment modulates the functions of PHHs *in vivo*. Stromal cells in the liver also affect various hepatic functions. A micro-patterned co-culture (MPCC) platform was engineered on adsorbed ECM from porcine and human decellularized livers as well as collagens I, III, IV, fibronectin, and laminin. Present gold standard for hepatocyte culture, rat tail collagen I, served as the control. ECM proteins were adsorbed onto tissue-culture polystyrene plates for 2 hours at 37°C. Soft lithography was used to pattern various ECM substrates into circular domains. PHHs selectively attached to the circular ECM-coated domains and were surrounded by murine embryonic 3T3-J2 fibroblasts. Liver function markers such as albumin, urea, cytochrome P450 as well as morphology were assessed over a period of 28 days. On human and porcine LBM, PHHs demonstrated functionality comparable to rat tail collagen I. Albumin secretion was enhanced by combinations of collagens I plus IV and fibronectin plus laminin. Human and porcine LBM can be used as functional substrates for the long-term culture of PHHs in MPCCs, resulting in stable hepatic functions over several weeks. Specific ECM combinations may be used for further studies of liver-specific diseases.

256. Soto, Patricia

A Piece of Cake

Undergraduate – Management

With the rising demand of socially responsible businesses that provide higher quality products and service, Pati Cake, a specialty retail bakery, aims to serve this demand. Currently, Pati Cake is being run as a home based cottage food operation applying for booths at famers markets. This paper will serve as an in depth analysis of the business concept, market, product, and operations for Pati Cake using various proven strategies such as Porter's Five Forces, SWOT Analysis, strategic analysis, etc. In addition, a synthesis and analysis of the Pati Cake business strategy (high end differentiator) applied to a class Capsim simulation will demonstrate how a similar business, industry and market

will operate, act and react in such conditions. The concepts and strategies outlined will then be applied in day-to-day operations of the business, recorded and analyzed to determine the best and most effective strategies for Pati Cake.

257. Spencer, Breyauna and Szpunar, Karl

Disambiguating the affect of interpolated testing on the build-up of proactive interference during learning

Undergraduate – Psychology

Students frequently report difficulty learning information presented at the end of long study sequences. Prior research has shown that information presented earlier in a study sequence interferes with learning of information presented later in a study sequence, but that interpolating study with testing can serve to protect against such buildup of proactive interference (PI). Nonetheless, it remains debated whether interpolated testing improves encoding or retrieval of information presented in later portions of study. In the present study ($N = 60$), students learned five interrelated lists of words. Students were always tested on the fifth list and then again during a final cumulative test. We used a 2×2 design to vary whether or not students were tested on the first four lists (i.e., testing versus control) and also the rate of presentation of individual words (4s versus 10s per word). We found that learning of the fifth list was impaired due to PI in the absence of previous testing (i.e., for lists 1 through 4) at both short and long presentation rates. However, during a final cumulative test that required participants to recall all study words, non-tested participants recalled words from the fifth list as well as tested participants, but only if they had studied words for 10s. Taken together, our results indicate the PI during learning arises largely due to constraints imposed by initial memory tests (i.e., during retrieval), and that an encoding manipulation can serve to overcome PI during later tests that do not impose similar constraints on retrieval.

258. Stark, Elizabeth

An Analysis of Charter Schools: A Neoliberal Reconstruction of the Education System into an Education Market

Undergraduate - Teaching of Mathematics

Education across the United States had always been divided into public and private schools, but in the 1980s, that all would change. Progressive educators introduced charter schools into the world of education in the 1980s. The National Charter Resource Center (2017) defines charter schools to be, “public schools operating under a “charter,” which is a contract entered into between the school and its authorizing agency. The charter also allows the school with significant operational autonomy to pursue specific educational objectives.” The growth of the charter school movement in the 21st century brought forth deregulation and privatization of schools. These charter schools have brought

privatization into a public education sector, as well as turned the education sector into a market that has promoted neoliberal policies and introduced a corporate makeover of public education. Charter schools and their policies have brought into question what is now considered public and private in regards to education in the United States. Thus, this project will explore the charter schools themselves, their neoliberal policies and ideals especially in Chicago, the relation to gentrification and racial inequalities in Chicago and New Orleans, and this radical neoliberal renovation of the education sector into an education market.

259. Subanajouy, Polatip; Gelb, Lev; Berry, Grant and Hanley, Luke

Multivariate Analysis of Mass Spectrometry Imaging Data of Pancreatic Tissue

Undergraduate – Chemistry

Mass spectrometric imaging (MSI) has shifted the paradigm for many disciplines, including diabetes, oncology, and pharmacology. We use time-of-flight mass spectrometry (TOFMS) for MSI, in which ion flight times in a vacuum tube are used to calculate mass-to-charge (m/z) ratios, for the identification of chemical species. MSI further correlates m/z ratios from the TOFMS to the spatial distribution of the analyte on an intact sample, such as a tissue slice. Unlike other microscopy methods, MSI does not require the modification of those analytes for marking. However, procedures culminating in ionization are not equivalent, because they may differ in ion-to-neutral ratios and suppression of signals for target analytes. This study uses MSI to investigate lipid content in sections of pancreatic tissue prepared for ionization by laser desorption ionization (LDI) and laser desorption postionization (LDPI). Multivariate analysis is used to decompose MSI data into contributions from different components. We relate these back to the fluorescence images stained for lipid/nonlipid contrast. Finally, the ion masses from the deconstructed images are compared for lipid and nonlipid regions. The ultimate goal of these studies is to use MSI to identify biomarkers for the onset of diseases associated with the disruption of lipid metabolism.

260. Suthar, Nidhi; Hardy, Laura and Burdette, Joanna

Investigating The Contribution Of p53 Mutation To Loss Of PTEN Induced Tumorigenesis And Resulting PAX8 Regulation By Thiostrepton

Undergraduate - Medicinal Chemistry & Pharmacognosy

High-grade serous ovarian cancer (HGSC) is the most lethal and frequent type of epithelial ovarian cancer. Recent studies have shown that the origin of HGSC may be the fallopian tube epithelium (FTE) rather than the previously accepted model of ovarian surface epithelium origin (OSE). Several alterations have been identified that work synergistically to induce tumorigenesis in HGSC, the earliest of which is the mutation of tumor suppressor p53, which is present in 100% of HGSC and requires additional

alterations to contribute to malignant transformation. Our lab has shown that the loss of the tumor suppressor PTEN alone induces tumorigenesis in a mouse model, suggesting the critical role of loss of PTEN in human HGSC. A third protein of significance is PAX8, which is expressed in 80-96% of HGSC and in the FTE, but not the OSE. Interestingly, mouse models of HGSC derived from the OSE acquire PAX8 expression. Inducing expression of PAX8 in the OSE results in an increase in proliferation. The purpose of this study is to elucidate early changes in HGSC progression and identify a potential therapeutic strategy to reduce PAX8 expression using the FDA approved drug thiostrepton. We hypothesize that mutation of p53 in addition to PTEN loss increases tumorigenic properties and that the addition of thiostrepton will reduce PAX8 levels and therefore reduce tumorigenic properties of cell lines. In order to study tumorigenic properties induced by these mutations, cell migration scratch assays were conducted using PTENsh, p53mut and PTENsh + p53mut FTE cell lines. The results indicate that cells with PTENsh +p53H show increased migration potential over PTENsh alone and p53mut. Additionally, an increase in PAX8 expression was seen in p53mut/Ras and PTENsh/p53mut cell lines when compared to control wild type FTE and this expression was reduced significantly with the addition of thiostrepton, indicating a potential treatment pathway.

261. Syed, Jawad; Wardrop, Duncan J; Vásquez, Frank X and Helan, Victoria

Dehydrative Fragmentation of 5-Hydroxyalkyl-1H-tetrazoles: A Mechanistic & Methodological Study

Undergraduate – Chemistry

The treatment of 5-hydroxyalkyl-1H-tetrazoles with carbodiimide reagents triggers a sequence of dehydration and fragmentation of the resulting tetraazafulvene to generate alkylidene carbene intermediates. These electron-deficient species are short-lived and highly reactive, yet can be productively harnessed for the purpose of organic synthesis due to a number of valuable reactions that they undergo, including stereospecific 1,5-C-H bond activation. The goal of this capstone project was to employ a multi-pronged approach to gain insight into the mechanism of this little-studied organic transformation. Initial studies focused on utilizing ab initio quantum chemistry methods and the UIC's supercomputing extreme server, to calculate the activation energy (E_a) of the thermal decomposition of a number of 5-hydroxymethyltetrazoles. More recently, we have begun a systematic examination of the general reactivity of 5-hydroxymethyltetrazoles with Brønsted-Lowry and Lewis acids.

262. Tam, Eric; Pal, Gian, MD, MS; Bhavsar, Radha, MD; Timms, Courtney, BS; Verhagen, Leo, MD, PhD; Hall, Deborah, MD, PhD and Marder, Karen, MD, MPH

Interest in Genetic Testing in Parkinson's Disease with Deep Brain Stimulation (DBS)

Undergraduate - Kinesiology and Nutrition

Parkinson's disease (PD) is a chronic neuromuscular condition resulting from deficient dopamine production within the brain. Patients may observe symptoms including muscle rigidity, extremity muscle tremors and changes with gait through their disease progression. Unfortunately, as a cure has not been discovered yet, the disease can still be well-managed and treated. However, research with Parkinsonian patients have found genetic mutations that correlate with higher risks of PD onset. Genetic mutations in the glucocerebrosidase (GBA), leucine-rich repeat kinase 2 (LRRK2) and parkin (PRKN) genes have influence on disease progression and available treatment outcome. Under Dr. Gian Pal, a Neurologist within Rush Hospital's Neurology Movement Disorders Specialty, the Genetic Attitude Questionnaire (GAQ), seeks to gain genetic knowledge, patient desire for genetic testing along with their reasoning behind testing. The GAQ projects seeks to understand factors that influence patient desire to undergo genetic testing. The questionnaire assessed genetic knowledge, patient desire for genetic testing, and reasons for testing. The GAQ was administered to 28 non-demented PD patients after DBS who were unaware of their genetic mutation status. Genetic knowledge, the desire for genetic testing, and reasons for testing were then quantified. Genetic testing is widely desired by PD patients with DBS if it is able to influence clinical decision making. The majority of PD patients have a basic understanding of PD genetics.

263. Tam, Patrick

Music Interpreter

Undergraduate - Computer Science

While improvising or playing music, it may be difficult for the musician to remember or determine what he/she is playing. To ease this difficulty, the Music Interpreter will take in the user's music through a microphone or through a .wav file to decode what he/she is playing. The Music Interpreter takes the music in as bytes, then determines what notes he/she is playing. The program determines this by analyzing the frequencies. It takes the peak in the frequencies of the sound, then translates the frequency into a readable music note for the user. In reading a .wav file, a sliding window is utilized to separate the music notes from each other and separating them based on how the music is being played. When using the Music Interpreter, musicians can improvise music with little to no fear of forgetting what they have played previously.

264. Tam, Shelby; Vinay Aakalu MD; Dhara Shah MS and Marwan Ali MRes

Healing Properties and Effects of Histatin on Corneal Injuries

Undergraduate - Lacrimal Cell Biology

This paper aims to describe histatin and why its properties make it suitable to aid in the healing process of corneal injuries. The paper will then address and describe two experiments performed to test the viability of different histatins in their abilities to perform successful wound closure on corneal injuries. The focus of this research is to find out if histatin can potentially be used on humans to treat diseases and injuries in the future based on in vitro scratch assays and in vivo mice corneal injury experiments. At this point in time, the experiments have not yet been completed for all testing of histatins and are in the relatively beginning stage of experimentation, but they do seem to offer an optimistic option for ophthalmic healing.

265. Tarawneh, Ammar; Okkema, Peter and Alena Kozlova

Functional Analysis of GAR-1 and GAR-2 Muscarinic Acetylcholine Receptors in *Caenorhabditis elegans*

Undergraduate - Biological Sciences

We wish to examine pharyngeal muscle contractions *Caenorhabditis elegans*. There are two types of muscle contraction, pumping, which occurs approximately 200 times per minute, and peristalsis, which occurs only once every ten pumps. Pharyngeal muscle contractions are essential for feeding in *C. elegans*. It is important to know which mAChR play a major role in these muscle contractions. Activation of muscarinic acetylcholine receptors (mAChR) can stimulate both pumping and peristalsis. *C. elegans* treated with arecoline, an acetylcholine muscarinic receptor agonist, were previously found to have a higher percentage of pumps in the pharynx being followed by peristalsis, slow pumping, and prolonged peristalsis. *C. elegans* contains 3 genes that encode mAChRs: gar-1, gar-2, and gar-3. In gar-3 mutants, in which the GAR-3 mAChR has lost its function, treatment with arecoline yielded no such response, and the pumping and peristalsis of the mutant remained the same as the untreated gar-3 mutants. This led to the hypothesis that GAR-3 is the major mAChR involved in pharyngeal muscle contractions. To test this hypothesis, time lapse images were collected to characterize pharyngeal muscle contractions that occur in gar-1(ok755) and gar-2(ok520) mutants before and after arecoline treatment. For each strain, the gar-1(ok755), gar-2(ok520), and wild type, a time lapse of five worms were taken without treatment with arecoline and another five worms after treatment with arecoline. Preliminary results indicate that pharyngeal muscle contractions in gar-1 and gar-2 mutants look similar to wild type animals. Upon arecoline treatment, both mutants showed decreased frequency of pumping, increased frequency of peristalsis, and prolonged peristalsis. These preliminary results confirms that GAR-1 and GAR-2 do not have any function in pharyngeal muscle contractions, and are consistent with the hypothesis that GAR-3 is the major mAChR involved in pharyngeal muscle contractions.

266. Tayag, Kristin Alyssa; Foucher, Kharma C. and Longworth, Jessica A.

Physical Fitness Levels, Lifestyle Behaviors, and Academic Success by College Major

Undergraduate - Kinesiology and Nutrition

Background: University students engage in unhealthy lifestyle behaviors, and these behaviors are linked to poor health and mental acuity. Kinesiology students study movement and exercise, and thus are more likely to be engaged in healthier behaviors. The purpose of this study is to determine whether Kinesiology students are more “fit” than non-Kinesiology students, and to determine the relationship between physical fitness, lifestyle behaviors, and academic success. Design: Ten Kinesiology students (5 female) and 10 non-Kinesiology students (5 female) will undergo three fitness assessments and self-report their exercise, diet, sleep, and study habits, as well as GPA. The assessments will measure maximal oxygen consumption (VO₂), maximum isokinetic muscle torque (T), and percent fat (FM) and fat-free mass (FFM). Independent t-tests will test for differences in VO₂, T, and FM and FFM between Kinesiology students and non-Kinesiology students. Pearson’s Correlation will be used to determine the relationship between fitness, lifestyle behaviors, and GPA. Results: We expect Kinesiology students to achieve higher VO₂, produce more T, and have lower FM and higher FFM than non-Kinesiology students. We also expect a positive correlation between fitness, lifestyle behaviors, and GPA. Discussion: Our aim is to determine whether Kinesiology students are more “fit” than non-Kinesiology students, and whether physical fitness is related to lifestyle behaviors and academic success. Further research examining the relationship between fitness, lifestyle behaviors, and academics could help bring awareness to universities about the importance of their students’ physical fitness. Additionally, further studies can be done to assess the effect of physical fitness in the classroom setting on student lifestyle behaviors in comparison to students whose curriculum is not centered on physical fitness.

267. Thakkar, Shreya; Iriarte, Jose; Yotsuya, Mamoru and Reed, David A.

TMJ Hypofunction Secondary to Post-Traumatic Insult Attenuates Chondral Lesion Formation

Undergraduate - Biological Sciences

Degenerative joint disease (DJD) accounts for 30.1% of temporomandibular disorders and has an unknown etiology. Post-traumatic insult to the TMJ using a unilateral partial discectomy surgical instability model induces DJD in a mouse model. This insult is associated with mechanical, metabolic, and inflammatory stress in the joint, potentially initiating and promoting the progression of degeneration. This study sought to establish if TMJ hypofunction secondary to post-traumatic insult to the cartilage is sufficient for attenuating late stage TMJ DJD progression. It was hypothesized that an unopposed molar model would attenuate contralateral joint reaction forces in mouse TMJ and slow the progression of DJD. Joint reaction forces in the unopposed molar model were calculated from free body analysis, with muscle vectors reconstructed from 3D osteological projections. Three in-vivo groups were compared: non-surgical control, unilateral partial discectomy (UPD), and UPD + unopposed molar (UM). UPD was achieved by excising the right articular disc from the TMJ. UM was achieved by excision of the left mandibular

molars and clipping of the left incisor. Procedures were performed on male c57BL/6 mice. Tissue was collected, sectioned, and stained with safranin o/fast green from 4, 8, and 12 week post-operative mice. Free body analysis found that joint reaction forces were decreased contralateral to UM excision by 33.9% distally, 26.6% mesially, and 1.3% during incisor biting. For the UPD group, 4 week post-operative mice showed elevated proteoglycan and condylar remodel, 8 week post-operative mice presented with decreased proteoglycan, chondral lesions and fibrillations, and 12 week post-operative mice presented with pervasive chondral lesions. In the UPD + UM group, proteoglycan and condylar remodeling was unaffected, but there was an absence of chondral lesions and fibrillations at 8 and 12-weeks post-operative. Removing the mandibular molars decreased joint reaction forces contralateral to tooth extraction, mitigating chondral lesion formation and cartilage fibrillation.

268. Thnaibat, Nayfah; Zaheer, Shamaila; Montero, Carlos; Zhao, Ming; Che, Chun-Tao and Warpeha, Katherine

Development of high polyphenol-producing broccoli as new chemical engines for health and disease

Undergraduate - Biological Sciences

Chronic inflammation precedes and underlies many chronic conditions and can lead to pain and disability affecting more than 100 million people in the USA. Current medications including non-narcotic (acetaminophen, NSAIDs) and narcotic drugs, which present serious drawbacks including lack of efficacy and toxic side effects, tolerance, and addiction. A major challenge is to develop effective, novel, safe approaches to prevent the demonstrated inflammatory basis of pain. Chronic inflammation is a complex response of multiple cell types, signaling pathways and inflammatory mediators. We target a new paradigm in the treatment of pain by making extracts from plants that have been enhanced to boost specific polyphenol chemicals that impart a anti-inflammatory phenotype. In the human diet, flavonoids are the most common phytochemicals, and hydroxycinnamic acid amides (HCAAs) are found in seeds and seedlings, active in defense. Both types of chemicals are polyphenols, where evidence indicates reduced inflammation responses. In plant cells we have studied the role of these chemicals in stress responses. We have also developed a way to induce the chemicals, have them retain stability for potential use as non-opiate therapeutics. We screened common Broccoli (*Brassica oleracea* var. *italica*) for high polyphenol lines by stress induction analysis. Those surviving plants produced a stable (not degrading) chemotype, a total of 116 lines. We classed their metabolic profiles into three chemical profile groups. Broccoli are usually self-incompatible so once you find a genotype producing chemicals you need it can be hard to maintain it, and if it is sterile you cannot maintain it easily; culture is difficult. My particular project was to pioneer a propagation method where stable lines could be identified identify and maximize the chemicals produced. I also report on progress to address the Research Question: Can a specific growth protocol utilize stress induction to boost broccoli chemicals that maximize polyphenol content in mutagenized lines that can be vegetatively propagated, to produce a stable source of potential therapeutics?

269. Thompson, Shameka

Voting and Irrationality

Undergraduate - Political Science

Why white working class citizens vote against their economic interests has become an increasingly popular topic since, the publication of Thomas Frank's *What's The Matter with Kansas*. Voting for Republicans, ordinarily the party of the rich and affluent seemingly works against their economic welfare and therefore, against what others presume is in their best interests. This paper explores the reasoning behind why these citizens vote the way that they do. I argue that this white working class segment values individualist traits, as illustrated through the use of psychological systems model, which accounts for why they may vote in favor of a noneconomic interest over material concerns. This psychological model demonstrates how personal factors can override or bypass economic concerns in decision-making.

270. Tovar, Kayleigh and Federle, Michael

Elucidating Rgg-mediated quorum sensing networks in *Streptococcus pneumoniae* and testing their contributions in pathogenesis

Graduate/Professional - Microbiology & Immunology

Quorum Sensing (QS), or bacterial communication by intercellular chemical signaling, is a process common to many (if not most) bacterial species; yet, it is unclear how QS signaling pathways contribute to virulence in many clinically significant pathogens. The Federle lab has helped to characterize a family of transcriptional regulators, known as Rgg proteins, as mediators of QS. We and others have shown the importance of Rgg proteins in multiple species of streptococci in regulating expression of genes that may enhance their ability to colonize and infect the host. Rgg proteins are known to regulate genes important for 1) controlling virulence; 2) promoting the development of resistance to lysozyme, a host-produced antimicrobial enzyme; 3) stimulating the formation of biofilms, or protective bacterial communities; and 4) initiating the development of natural competence to take up DNA from the environment. The role of the Rgg proteins in the pathogenic lifestyle of the clinically significant pathogen *Streptococcus pneumoniae* has yet to be investigated, but published genome-level mutagenesis studies indicate Rgg proteins in this organism are critical in models of infection. We have constructed isogenic mutants for each Rgg paralog important in these models and are in the process of determining their significance for survival in mouse models of nasopharyngeal colonization and invasive lung infection. We will then elucidate the molecular networks under Rgg regulation. We expect these approaches will provide the first step in developing novel therapeutics to combat clinically significant pathogens by interfering with QS pathways.

271. Traver, Mallory; Hwang, Changhwa and Njongmeta, Leo

Laboratory Risk Assessment and Implementation of the Emergency Equipment Management Program at UIC

Undergraduate - Public Health

The Occupational Safety and Health Administration (OSHA) requires functional eyewash and safety shower units in places of work where employees are at potential risk of exposure to corrosive chemicals and other hazards capable of causing bodily injury. The Environmental Health and Safety Office (EHSO) conducts routine laboratory safety audits including annual inspections of eyewash stations and safety showers to ensure optimal operations in emergency situations. Four research buildings on campus (SES, MBRB, COP, COMRB) account for close to 50% of inspected eyewash and safety shower units (474 out of 985) on the campus. The main objective of this study is to determine if there is a correlation between safety equipment (eyewash and safety showers) compliance and distribution of hazardous research materials stored and manipulated in these selected buildings. Hazard inventory for each building will be conducted using laboratory hazard ID cards and annual laboratory audits and eyewash/safety shower compliance information obtained from the EHSO Laboratory Safety database. Data analysis will be conducted and the results used to inform and improve laboratory risk assessment and the safety shower and eyewash compliance program.

272. Udoetuk, Stella and Bhatt, Kruti

Social Justice Framework for Teaching Pre-Health Students

Undergraduate – Chemistry

Pre-health professionals must obtain a fundamental understanding of cultural competency in order to treat and work with diverse populations; yet it is not extensively taught in undergraduate coursework. Further, pre-health students are not adequately exposed to social justice issues, especially those pertaining to health inequities. Exposure to social justice in the health field will help nurses navigate inequities and provide quality healthcare to all patients regardless of race, age, gender, sexuality, and ability. Providing exposure to inequities in the current healthcare system may drive students to be a force for change in the system. This study focuses on an undergraduate organic chemistry lab course for pre-nursing students. One lab aims to teach about carbohydrate chemistry and the students in this lab are responsible to develop tests for Sucrase-isomaltase (SI) deficiency. SI deficiency, though relatively rare, is disease that affects nearly 5-10% of the Inuit population. SI deficiency symptoms appear in infant to early childhood. Students in this lab will use Inuit population as a case study to understand how rare diseases affect culture and diet and to understand how research can benefit non-majority populations. The students will compare their cultural diets to that of the Intuits and of the

other student in the class. They will also work to understand how the Inuit diet is affected by availability, culture, and Western influences. Another lab was developed to illustrate methods for detection of neonatal respiratory distress (NRDS), the leading cause of death in pre-term infants. While 99% of infant deaths occur in low resource settings, most research aims at causes that are prevalent in developed countries. Students are asked to consider treatments that can be used to decrease the rate of NRDS if the proper machines and ventilations are not available, particularly in settings where home births are common.

273. Ulm, Ashley; Brennan, Kevin; Lebowicz, Leah; Luciano, Cristian; Vinyard, Christopher J. and Druzinsky, Robert E.

Visualizing the Attachments and Internal Architecture of the Masseter Muscle in Cavia Porcellus Using Contrast Enhanced Micro-CT

Graduate/Professional - Biomedical Visualization

Contrast enhanced micro-Computed Tomography (CE micro-CT) renders the anatomy of soft tissues in detail that has, here to for, been unavailable through standard micro-CT. The CE micro-CT scans provide a level of contrast in soft tissues that often permits visualization of individual muscle fascicles. Although exquisite details of the internal architecture of muscles can be seen in published slices from CE micro-CTs, published 3D reconstructions of muscles do not depict those details. The purpose of this project is to utilize CE micro-CT to segment out the masseter muscles of a specimen of *Cavia porcellus*, the guinea pig, and visualize the details of the internal architecture of those muscles. The head of an adult guinea pig was soaked in a solution of called iodine potassium iodide (I₂KI) for several weeks and then scanned at Northeast Ohio College of Medicine using the Scanco vivaCT micro-CT. The Materialize Mimics® Innovation Suite will be used to capture this detail in 3D and allow full reconstruction and exploration of the muscle fiber internal micro-architecture. This data will be put into a 3D PDF to facilitate further research into the attachments, internal structure, and biomechanical function of the masseter and its parts. We hope to develop standardized methods for visualization of muscle architecture that will facilitate future analyses of CE micro-CT datasets.

274. Vashi, Rohan; Elfeki, Maryam; Costa, Sofia and Murphy, Brian T.

Analysis of Specialized Metabolite Production in Streptomyces and Micromonospora Strains Isolated from Lake Huron

Undergraduate - Medicinal Chemistry & Pharmacognosy

Marine bacteria have recently been recognized as sources of novel antibiotic molecules, pinning them as potential targets to study in the field of drug discovery. However, differences in the production of antibiotic molecules may be observed due to selective pressures found within the strain's environmental residence. This study aims to observe

this effect within 22 Streptomyces and 25 Micromonospora strains isolated from the Lake Huron basin and hypothesized that differences in the geographic location from which the bacterium are isolated resulted in different selective conditions, which allowed the various strains to inherit the ability to produce different specialized metabolites. Strains were first cultured in ISP2F broth and frozen into cryovials for storage. The identity of each of the strains within the two bacterial genera was then confirmed by DNA sequencing of the 16S rRNA, and considered to be identical if they exhibited $\geq 99\%$ similarity in sequence. Specialized metabolite production in each strain was observed using MALDI-TOF mass spectrometry, analyzed using principle component analysis and hierarchical clustering in conjunction with the 16S rRNA data, and visualized using specialized metabolite networks assembled using statistical algorithms.

275. Vazquez, Mirna and Okkema, Peter

Isolating Suppressors of T-box Mutant Lethality in *C. elegans*

Undergraduate - Biological Sciences

T-box transcription factors play an important role in the development of all animals, and defects in T-box genes are involved in a variety of human genetic diseases and cancers. However, despite their important functions, we are uncertain of how T-box transcription factors function at the molecular level. We are characterizing the *C. elegans* T-box factor TBX-2, to understand the molecular function of these factors. TBX-2 functions with the Groucho family co-repressor UNC-37 in pharyngeal muscle development. Double mutants homozygous for the partial loss-of-function alleles *tbx-2(bx59)* and *unc-37(e262)* exhibit a strongly enhanced temperature sensitive lethal phenotype with loss of anterior pharyngeal muscles. We have carefully characterized the lethality of these *unc-37(e262); tbx-2(bx59)* double mutants at various temperatures, and found that at 23.5°C and 25°C no animals reach adulthood. To identify new genes functioning with TBX-2 and UNC-37, we have isolated mutations that suppress *unc-37(e262); tbx-2(bx59)* lethality at 23.5°C. We are now phenotypically and molecularly characterizing these suppressed strains. This work will increase our understanding of how *C. elegans* TBX-2 functions, and we expect that it will increase our mechanistic understanding of T-box factors in all animals.

276. Villanueva, Ulani; Berhelhammer, Max and Villanueva, Ulani

In-Vitro Model for Studying Fluid Turnover in Humans

Undergraduate - Kinesiology and Nutrition

Purpose: This study used an in vitro model to validate a method for assessing total body water (TBW) and daily fluid turnover (FTO) in the human body. TBW and FTO are important aspects of studying energy balance and daily energy expenditure in healthy and ill humans. The specific aim was to validate the analytical method for assessing

deuterium using cavity ring-down spectroscopy (CRDS) including determining the sensitivity and range of CRDS. Methods: A large container filled with 40 L of tap water represented TBW of a reference human (TBW1). The criterion consisted of weighing the container (Mettler-Toledo scale; +1 g). A pre-weighed dose of deuterium oxide (~3 g D₂O) was added, thoroughly mixed, and a sample was stored for CRDS analysis. To represent 2-L daily FTO in sedentary humans for one week, ~14 L of water was removed from the container, replaced with 14 L of tap water, and mixed well. A sample was stored as the new, elevated background deuterium. The container was again spiked with ~3 g of deuterium, mixed, and a sample was extracted and stored (TBW2). The procedure was repeated for third cycle and measure of water mass (TBW3). To simulate preparation of urine or plasma samples required for CRDS, water samples underwent a 4-day distillation with Conway dishes. Distillation ratios of 1:1 (D₂O sample to deionized water) were used for TBW1, TBW2, and TBW3. In addition, the TBW3 was distilled with 1:3 in case 1:1 exceeded the CRDS upper range. Results: Coefficients of variation for triplicate CRDS analyses per sample ranged from 0.06 to 1.2 %. The table compares Weighed vs. tracer dilution (D₂O CRDS) estimates of TBW (kg units).

Method	TBW1 (1:1)	TBW2 (1:1)	TBW3 (1:1)	TBW3 (1:3)
Weighed	39.62	40.14	39.81	39.81
D ₂ O CRDS	44.88	45.29	47.511	56.33
% Difference	13.1	12.8	19.3	41.5

Conclusions: D₂O dilution produced overestimates of ~5 L in the best case. The percentage of error was high and likely due to fractionation as the deuterium did not fully exchange with deionized water in the Conway dish. An alternative method of purifying samples prior to CRDS analysis needs to be evaluated.

277. Wahdan, Sarra

The Effect of Math Tutoring on Student Attitudes Towards Mathematics and on Student Achievement

Undergraduate - Mathematics, Statistics, and Computer Science

Mathematics has commonly been labeled as the most difficult subject for students. This then leads to negative attitudes towards mathematics and low achievement in math classes. Tutoring is the common reaction and potential solution to low grades and negative attitudes towards a subject. However, does mathematics tutoring lead to positive attitudes towards mathematics or do the students remain having negative attitudes towards the subject even after tutoring? This research began with collecting data from subjects who have never been tutored in mathematics in order to create a control group for data comparison. Subjects who have participated in mathematics tutoring are surveyed and interviewed regarding their attitudes towards math and their achievement in math classes. Other than comparing the subjects who have been tutored to the control group, this study also compares the attitudes and achievement of the test group subjects with respect to the number of tutoring visits and the structure of the tutoring session. Through surveys and interviews, this study has found that a considerable amount of students remain with a lack

of confidence and dim views towards mathematics depending on the structure and the number of tutoring sessions they attended. Subjects who attend more one-on-one, periodic tutoring sessions with a consistent tutor and an interactive tutoring structure are the most likely to gain a positive attitude towards the subject and also receive higher grades in the related course. This study explores which tutoring structure works best in achieving both higher achievement and positive attitudes towards the subject.

278. Walter, Jessica and Junker, Laura Lee

Methodological Analysis of the 1995 Tanjay Archaeological Survey

Undergraduate – Anthropology

Contrary to what many in the public may believe, excavation is only one small part of the work done by archaeologists. Archaeological surveys not only serve to find sites prior to excavation, but, in cases where excavation is impractical, or even impossible, they can give researchers a glimpse of the settlement patterns in the region, with information ranging from site size, activities carried out there, socioeconomic relations between sites, and more. However, there are many factors that can impact the results of a survey and affect interpretation of the collected data. In this study, I reviewed the field notes from a 1995 archaeological survey of the Tanjay region on the island Negros in the Philippines. Using data from 40 different surveyed agricultural fields with documented archaeological remains, I examined various factors that affected the probability of certain artifact classes, and artifacts in general, being observed on the surface by archaeologists. Variables included the size of the field, how much time was spent surveying it, whether or not it was currently planted with crops and, if so, how and when it was last plowed, the types of crop and their respective heights; and the general field conditions, when it rained last, the types of soils, the slope of the field, and its proximity to modern habitation. Using statistical analysis in SPSS, I then compared these variables - which included both environmental factors (e.g. recent rainfall resulting in more visible artifacts, vegetation obscuring surface visibility) and human factors (e.g. surveyors walking slower and “seeing” more on the surface, nearby modern inhabitants mixing in contemporary debris) - with the amounts and densities of artifacts (earthenware, porcelain, shell, metal, and stone tools) found in each field to see just how these factors could be expected to alter an archaeological team’s findings and interpretations.

279. Wang, Yifan; Chen, Jiwang; Zhao, Shuangping; Huang, Longshuang; Felesena, Nicholas; Natarajan, V and Machado, RF

SphK1 Deficiency in Smooth Muscle Cells Protects Against Hypoxia- or hypoxia plus Sugen mediated Pulmonary Hypertension

Undergraduate - Medicin

Sphingosine kinase 1 (SphK1) regulates the synthesis of the bioactive sphingolipid sphingosine 1-phosphate (S1P), an important lipid mediator that promotes endothelial cell proliferation, migration and angiogenesis. Serum S1P activates YAP1 signaling pathways and YAP1 activation promotes cell proliferation. We previously reported that SphK1 mRNA and protein levels were significantly up-regulated in pulmonary artery smooth muscle cells (PASMCs) isolated from patients with pulmonary arterial hypertension (PAH). In this study, we investigated whether smooth muscle cell conditional SphK1 deficient (*SM22αCre + SphK1 f/f*) mice are protected from experimental models of pulmonary hypertension (PH) and whether YAP1 plays a role in SphK1-mediated PH development.

280. Wierzchowski, Adrian

Regioselectivity and Reaction Rates in Alkene Systems

Undergraduate – Chemistry

Radicals play a crucial role in many synthesis reactions in organic chemistry. A key example is the use of alkoxy radicals in isomerizations due to their high H-atom abstracting capabilities as well as their ability to be formed from an assortment of precursors in mild environments. The purpose of this study was to compile information on what factors affect the regioselectivity and rates of radical generation, radical addition, and radical transfer reactions in alkene species. It was hypothesized that thermodynamic effects would primarily influence all three types of reactions. The regioselectivity and reactivity of radical reactions is actually highly dependent on the type of radical reaction being performed. In radical transfer and radical addition reactions, the relative strength of the bonds being broken and the polarity in the transition state control free radical substitution reactions. The regioselectivity of radicals in radical addition reactions also depends on whether the species is electron rich, neutral, or poor. In electron rich and neutral alkene species, regioselectivity is primarily thermodynamically controlled. In electron poor alkene species, regioselectivity is mainly influenced by polar effects. The relative contribution of thermodynamic or polar factors in radical generation depends on the magnitude of ΔH . Thermodynamics wins out if ΔH is large. If ΔH is small, initial radical generation primarily depends on the polarity of the species in question. Kinetic solvent effects must be kept in mind in all types of radical reactions so as not to reduce the rate of a reaction by introducing an undesired side reaction. This marks an important shift in previous thinking which assumed radical-based methods are not influenced by solvent effects on their reactions kinetics and reaction products.

281. Wilczek, Bernadette

Reading Bruno Schulz's "Sanatorium Under the Sign of the Hourglass" as a Politically Engaged Text

Undergraduate - Slavic and Baltic Languages and Literatures

This research project and paper offers a new interpretation of a short story published in 1936 by Bruno Schulz, a Polish Jewish writer from the Galician city of Drohobycz, entitled “Sanatorium Under the Sign of the Hourglass.” In preparing the paper I conducted research into the political and historical context in which Bruno Schulz lived, focusing on the Jewish cultural and political context in Poland in the early 20th century and the rise of Jewish nationalism. My paper offers a political interpretation of Bruno Schulz’s “Sanatorium Under the Sign of the Hourglass,” and reads it as a critique of the Zionist movement’s focus on creating a Jewish state in Palestine during the interwar period. Bruno Schulz has generally been read as unengaged in the political debates of the interwar period. Through research on Zionism and other political choices Jews faced in interwar Poland, however, I found that a close examination of the metaphors that occur throughout Schulz’s works reveals his politically engaged critique of the Zionist movement in his “Sanatorium Under the Sign of the Hourglass.” Through my study I was able to challenge the way a well-known author in Polish literature has traditionally been understood and interpreted.

282. Wilson, Amaalyah

The effects of Social Media on Human Resources Hiring Process

Undergraduate – Management

This study involved examining how social media can affect how human resources hire candidates for opening positions and the legal issues that come along with it. A literature review was conducted on previous studies and introduced recommendations to better understand the effects of social media on HR. The literature review focuses on a case study conducted in 2012, named “Should human resource managers use social media to screen job applicants? Managerial and legal issues in the USA.” They analyzed problems that were reported in the business press and identified the issues using concepts relative to Human Resources. The original study found that when companies are using social media to screen candidates, they obtain a greater amount of information about the candidates which was not readily available through conventional means. Companies saw it as an additional resume. Issues were raised due to invasion of privacy, information accuracy, and arguments rising if social media should be used. The completion of this literature review ended with recommendations based on the findings that social media should be used to a certain extent in hiring candidates. Candidates should create a professional profile where companies can observe in order to determine if they should hire them or not.

283. Wright, Dorothy

Ozone Disinfection of E. coli in Secondary Treated Final Effluent Wastewater

Undergraduate - Environmental and Occupational Health Sciences

Diarrheal illness in the developing world is a major public health concern. Repeated diarrheal illnesses can cause stunting of physical development, intellectual development, and in many cases death of children. In numerous parts of the developing world, the cause of diarrheal illness is the contamination of rivers and lakes by untreated sewage. A solar powered ozone generator, point of use treatment method, has been developed for drinking water disinfection. The aim of our research is to determine how effective ozone disinfection treatment would be against E. coli. Turbidity or 'cloudiness' a physiochemical characteristic of untreated water is formed by particulate organic matter found in lakes and rivers. Turbidity influences the effectiveness of drinking water disinfection. Our hypothesis, more turbid water will decrease the effectiveness of ozonation disinfection. The relevance of our research is to develop user friendly instruction protocol for safe and effective disinfection treatment. We used ozonation disinfection on secondary treated effluent wastewater (FE) from the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). FE undergoes some treatments but not disinfection. Ozonation was performed without added turbidity and with specific amounts of added humic acid, simulating turbidity. Ozone and E. coli concentrations were taken pre-treatment, during, and post-treatment. Humic acid was added to FE to create degrees of turbidity, 5-35 nephelometric turbidity units (NTU). The data shows rates of disinfection in FE without added turbidity may reach disinfection level of 0 MPN E. coli present at +/- 60-120 minutes. Disinfection in FE with added humic acid show disinfection occurring at much slower rate, +/- 0-100 MPN E. coli present 120-180 minutes. The rate equation (concentration E. coli + turbidity) x (time) determines the effectiveness of ozonation disinfection. Higher concentrations of turbidity equal more time necessary to reach safe levels of disinfection.

284. Wu, Lanny

Sleep Activity and its relation to Gestational Diabetes in Pregnant Woman

Undergraduate - Biobehavioral Health Science

Gestational diabetes mellitus (GDM) is typically diagnosed in pregnancy as early as the second trimester (13 weeks to 27 weeks) or until the third trimester. It is caused by elevated glucose levels, which cause extra glucose to be "absorbed" by the fetus. This then causes the fetus to become larger in size due to the extra fat being stored in the body. When mothers are diagnosed with GDM, the infants are more likely to develop diabetes as they age. There are some studies that show an association between gestational diabetes and sleep-related disorders. A sleep disorder such as obstructive sleep apnea can be observed during a sleep study based on their Apnea-Hypopnea Index (AHI). AHI is the amount of apneas or hypopneas detected per hour of sleep, which helps with the prognosis of the disorder. Early diagnosis and treatment could potentially be associated with the reduction of poor fetal outcome risks. A case-control study is conducted to measure objective sleep parameters through the usage of polysomnography, sleep-monitoring activity watches and participant's self-reported online questionnaires. The objective of

this study is to evaluate if sleep activity increases the risk of infant complications in pregnant women with gestational diabetes. What is being sought is the investigation of the association of GDM between sleep-related activities and pregnancy outcomes.

285. Xu, Jingting

Inferring Genome-wide Absolute Methylation Level from DNA Enrichment Experiment

Graduate/Professional – Bioengineering

DNA methylation is an essential epigenetic modification that plays a key role associated with the regulation of gene expression during differentiation. On the other hand, in disease states such as cancer, the DNA methylation landscape is often deregulated, thus DNA methylation study plays a vital role in the epigenetic regulatory research.

Recent advancements in sequencing-based DNA methylation profiling methods provide an unprecedented opportunity to map complete DNA methylomes. These include whole-genome bisulfite sequencing (WGBS, MethylC-seq, or BS-seq), reduced-representation bisulfite sequencing (RRBS), and enrichment-based methods such as MeDIP-seq, MBD-seq, and MethylCap-seq. These methods yield largely comparable results yet differ significantly in the extent of genomic CpG coverage, resolution, quantitative accuracy, and cost. Here, we present an algorithm that infers genome-wide absolute DNA methylation levels from less costly enrichment-based methods (such as MeDIP-Seq) yet yields accuracy and resolution comparable to the 10-folds more expensive bisulfite convert based methods (such as WGBS) with the same or more genomic coverage, enables cross-reference studies using abundant and readily available data of DNA enrichment-based methods in the public repository with other ChIP-Seq, RNA-Seq, etc datasets.

286. Yahyanejad, Farzaneh; Das Gupta, Bhaskar; Karpinski, Marek and Mobasher, Nasim

Effect of Gromov-Hyperbolicity Parameter on Cuts and Expansions in Graphs and Some Algorithmic Implications

Graduate/Professional - Computer Science

δ -Hyperbolic graphs, originally conceived by Gromov (Essays in group theory. 1987), occur often in many network applications; for fixed δ , such graphs are simply called hyperbolic graphs and include non-trivial interesting classes of “non-expander” graphs. The main motivation of this paper is to investigate the effect of the hyperbolicity measure δ on expansion and cut-size bounds on graphs (here δ need not be a constant), and the asymptotic ranges of δ for which these results may provide improved approximation algorithms for related combinatorial problems. To this effect, we provide constructive bounds on node expansions for δ -hyperbolic graphs as a function of δ , and show that many witnesses (subsets of nodes) for such expansions can be computed efficiently even

if the witnesses are required to be nested or sufficiently distinct from each other. To the best of our knowledge, these are the first such constructive bounds proven. We also show how to find a large family of $s-t$ cuts with relatively small number of cut-edges when s and t are sufficiently far apart. We then provide algorithmic consequences of these bounds and their related proof techniques for two problems for δ -hyperbolic graphs (where δ is a function of the number of nodes, the exact nature of growth of f being dependent on the particular problem considered).

287. Yang, Albert and Whelan, Christopher

Seed Preferences of *Passer Domesticus* and Other Granivores at the UIC Greenhouse Grounds

Undergraduate - Biological Sciences

As a highly ubiquitous species within the United States and a most of the rest of the world, the house sparrow (*Passer domesticus*) has been and continues to be greatly associated with humans. Although described as a commensal species, house sparrows have been noted to do substantial damage to agricultural fields. We determined the seed preferences of *P. domesticus* and other granivores at the UIC Greenhouse to suggest potential crop companion plantings that may deter or discourage birds from feeding on major agricultural grains. I determined diet preferences for different seed types by collecting giving-up densities (GUDs -- the density of seeds left in an experimental patch when foraging stops) of avian granivores at the UIC Greenhouse from late September to early February. House sparrows were the only prominent species of avian granivore in the UIC Greenhouse area from September to mid-October, when other foragers, including dark-eyed juncos (*Junco hyemalis*) and white-crowned sparrows (*Zonotrichia leucophrys*), were observed. I hypothesized that the bird foragers would prefer seeds of grasses to those of forbs (wildflowers). Preference was determined by comparing GUDs statistically with general linear models. I found no significant difference between GUDs for proso millet (*Panicum miliaceum*) and for whole rice (*Oryza sativa*), but lower GUDs for millet than for shelled rice. Similarly, GUDs were significantly lower for millet than for two forbs: buckwheat (*Fagopyrum esculentum*) and safflower (*Carthamus tinctorius*). When offered crushed buckwheat, the GUDs decreased, indicating that the aversion to buckwheat was from physical rather than chemical characteristics. Further experiments will determine whether the aversion for safflower is likewise physical or chemical. Overall, results confirm the preference for seeds of grass species (millet and rice) over those of forbs (buckwheat and safflower). Companion planting with these two species could deter bird foraging in agricultural fields of cereal crops.

288. Yang, Hyerim; Lutz, Joseph and Childs Emma

Reversal learning and reacquisition of virtual reality conditioned place preference in humans

Undergraduate – Psychiatry

Studies using virtual conditioned place preference (VCPP) computerized tasks have contributed to our understanding of conditioned behaviors in humans. Previous studies have focused on assessing acquisition and extinction of conditioned place preference (CPP). However, reversal and reacquisition of conditioned behaviors in this paradigm remain uncertain. The current study aims to determine whether monetary VCPP can be reversed or reacquired following its extinction. Healthy men and women (N=70) completed a VCPP computerized task. During the first session, participants completed 6 conditioning trials in which they were exposed to 2 similar yet distinct rooms, one of which was associated with high monetary reward, and the other with low monetary reward. During the second session, participants were assigned to one of 3 conditions. In the first condition (N=25) participants again completed 6 conditioning trials in which the reward-room pairing was reversed. In the second (N=20) and third (N=25) conditions, participants completed a cue exposure task in which they received a small amount of money in either a neutral environment (condition 2) or in the high reward room (condition 3). Subjective (room ratings) and objective preference (time spent) for the rooms was evaluated at various times throughout the sessions. Following conditioning, participants exhibited significant preference for the high reward room. This effect was transient and CPP was extinguished when participants returned for their second session. Reversal of the reward-room pairing resulted in significant reversal of CPP. On the other hand, monetary cue exposure in either a neutral or conditioned environment was insufficient to induce reacquisition of CPP. This study confirms that monetary CPP in a virtual apparatus can be reversed and therefore offers a unique opportunity to investigate the underlying mechanisms of CPP and reversal learning.

289. [Yard, Lauren](#)

Social Media Affordances and Governance: Effects of External Legislation on Health Insurance Organizations' Social Media Policies

Undergraduate – Communications

While many researchers have studied the differing trends in internal social media policies over the past five years, they have failed to acknowledge the differing external environmental factors that could influence the way in which policy is formed. Particularly within the healthcare sector, Health Insurance Portability and Accountability Act (HIPPA) and the Affordable Care Act (ACA) create distinct and tangible external policies that could potentially influence the internal policies that are formulated. Healthcare organizations must form their policies more thoughtfully to develop a useful policy that addresses the needs of the organization, and the rights of both customers and employees. This ultimately leads to the question, what are the themes, commonalities and differences between organizational social media policies considering their need to address the limitations imposed by current legislation? To examine the influences that govern social media behavior within the organization, this study employs a qualitative content analysis of social media policies requested from 84 of the largest health insurance companies in

the United States. This methodology builds off prior studies of organizational behaviors and analyzes the affordances and indicated perception of the use of social media by organizations. Ultimately, it is expected that there will be a significant focus on the aspect of patient privacy, and potentially on accountability of employees for what they post. These findings distinguish how external environmental factors can shape the formation of internal organizational policy and show how those external forces can also shape the perceived top level affordances of social media and how organizations govern what they believe to be the perceived affordances of social media by employees. Understanding these three distinct levels can help to form more effective and less unnecessarily restrictive policies in the future.

290. Young, Alexandria; Herrera, Denise; Ren, Yulin; Woodard, John L; H Huntsman, Andrew C; Fuchs, James R; Kinghorn, A Douglas and Burdette, Joanna E

Phyllanthusmins, a Promising Potential New Class of Natural Product Chemotherapeutic, for Use in the Treatment of High Grade Serous Ovarian Cancer

Graduate/Professional - Medicinal Chemistry & Pharmacognosy

The need for new chemotherapies is especially great in high-grade serous ovarian cancer (HGSOC), the most lethal gynecological malignancy. The overall survival rate has not changed in the last 50 years. About 75% of HGSOC patients relapse within 2 years of first-line therapy and no optimal therapeutic recommendations have been established for the treatment of recurrent disease. A recently discovered class of natural product, phyllanthusmins (PHYs), may have a novel mechanism of action, slowing the growth of tumor cells in various types of cancer *in vitro* and *in vivo*. Our study focused on the action of these compounds in ovarian cancer, using two HGSOC cell lines (OVCAR3 and OVCAR8) and one normal ovarian surface epithelial cell line (IOSE80). Cell lines were tested with PHY analogs in a range of doses for 3 days. Based on sulforhodamine B assays, the most potent analog, PHY34, had an IC₅₀ of 4.1 nM in OVCAR8 and 3.9 nM in OVCAR3. PHY34 was not potent against IOSE (IC₅₀=18.3 μM). Structure activity relationships suggest that the addition of bulky substituents to the compound's sugar group confer the greatest potency. Clonogenic assays indicate cytotoxicity and reduction of 2D foci formation at concentrations as low as 10 nM. Western analysis and annexin V/PI staining suggest PHYs work by inducing apoptosis. *In vivo* assays, including hollow fiber and intraperitoneal xenografting with IVIS imaging, revealed that low doses (0.75 mg/kg) of PHY34 are able to slow the growth of OVCAR8 cells intraperitoneally. Preliminary data indicates the PHY mechanism of action may involve induction of autophagy. Phyllanthusmins represent a promising, potential new class of chemotherapeutic, which has nanomolar potency in ovarian cancer cell lines *in vitro* and *in vivo*, without similar effect in normal cell lines *in vitro*. Their mechanism may involve the induction autophagy and apoptosis in cancer cells.

291. Zeno, Hani; Bushneva, Yana and Iriarte-Diaz, Jose

The Effect of Variation of the Jaw Musculature and Cranial Morphology on the Bite Performance of Primates

Undergraduate - Biological Sciences

Diet affects many aspects of primate biology. It has been hypothesized that variation in their musculoskeletal apparatus of the cranium and mandible of primates reflects adaptations to functional demands of the feeding system. In this study, we seek to correlate the mechanical performance of different cranio-mandibular morphologies observed in extant primates with their phylogenetic, ecological, and behavioral characteristics. We used 3D virtual models of the cranium and mandible of 69 species of primates to map the position and orientation of the major jaw-closing muscles (masseter, medial pterygoid and temporalis). Biting force was assessed by applying a 3D mechanical model that takes into consideration the position and orientation of the muscles as well as the position of the biting point and the jaw joint. Relative biting forces were obtained from these models and compared between species. We found that biting force is heavily influenced by phylogenetic factors and less influenced by diet. Also, no all muscles contribute to bite force in the same way, and its contribution depends mostly by taxonomic affiliation, but also modulated by diet. Analysis of other feeding performance parameters still are needed to better understand the evolution of the cranio-mandibular apparatus in primates.

292. Zink, Katherine; Dean, Matthew; Burdette, Joanna E. and Sanchez, Laura M.

Visualizing the Chemical Communication Governing Ovarian Cancer Metastasis with Imaging Mass Spectrometry

Graduate/Professional – Pharmacognosy

Ovarian cancer is one of the leading causes of cancer-related deaths among women due to the difficulty of recognizing the early stages of the disease. A precancerous mutation in a fallopian tube epithelial cell is believed to be the origin of many cases of ovarian cancer, but not until that cell colonizes the ovary during ovulation is tumorigenesis possible. However, there are currently very weak conclusions citing chemical compounds that may be involved in this transformation and colonization. Therefore, understanding the chemical communication that occurs between the fallopian tube and the ovary is the aim at the heart of our research. We are attempting to study chemical communication in a 3D cell culture environment using a technique called imaging mass spectrometry (IMS). MALDI-IMS allows us to visually recognize the spatial distribution of molecules within a system and provides insight into their interaction, distinguishing discreet molecules by their mass signatures. Mass-guided analysis is extremely valuable in characterizing the molecules implicated in this interaction; masses that indicate up- or downregulation in a healthy ovary grown in an in vitro environment may be crucial players in pathways that lead to cancer development. Our findings indicate clearly that the MALDI-IMS method

developed is capable of detecting unique chemical signals at a very low mass range both in the 3D cell cultures and at sites of interaction between ovarian tissue and cell cultures. We currently have a molecule of a mass at 170.6 whose upregulation in the presence of a 3D cell culture embedded with an ovary indicates that it may be implicated in the development of ovarian cancer. Understanding the biological roles and origins of these molecules are vital steps for developing health screenings or assays that may be able to detect or predict the presence of a particular malignant biomarker.

293. Zocchi, Alejandra and Caskey, Rachel

Quality Improvement Project: Analysis of Physician Communication about the HPV Vaccination

Undergraduate - Biological Sciences

Although the Human Papillomavirus (HPV) vaccine has been proven to be effective in the prevention against HPV-related disease, vaccination rates lag behind other adolescent vaccines. Physician focus on preventive benefits of vaccination, rather than the mode of transmission (intimate contact), may improve parental acceptance and increase the rates of HPV vaccination among adolescents.

Research assistants covertly collected data on physician presentation of HPV vaccinations to adolescent patients (<18 years old) and their parent under the guise of a shadowing student. Physicians were blinded to data collection. During pre-intervention data collection, forty doctor-patient encounters were observed and physician presentation of the HPV vaccine and parental response were recorded. The intervention was an educational presentation to resident physicians about how to effectively talk about the HPV vaccine with families by focusing on cancer prevention. During post-intervention data collection, thirty-two doctor-patient encounters were observed and data was collected on how physicians presented the HPV vaccine and parent response.

Prior to the intervention, 62.5% of physicians discussed the mode of transmission of HPV when discussing the vaccine with parents. During both pre- and post-intervention, parents that initiated the conversation with the physician about HPV had more hesitations regarding vaccination. After the intervention, 92.3% of physicians focused on cancer prevention benefits of the vaccination. There was 40% increase in acceptance by parents of adolescents when physicians were initiated the HPV immunization discussion.

This quality improvement project demonstrates that educating physicians to focus on cancer prevention, rather than mode of transmission, when discussing the HPV vaccine with families results in an increase of vaccination rates by 0.4%. Post-intervention, a 17.3% increase was seen in the initiation of immunization discussion by physicians leading to a 40% increase in the acceptance rate by parents. Resident physicians were successfully able to modify the way they discuss the HPV vaccine.

294. Zuba, Jessica

Outcomes of Preliminary Interviews with Key Stakeholders of Illinois' Short Term Stabilization Homes Program

Undergraduate – Psychology

In 2016 the Illinois Department of Human Services' Division of Developmental Disabilities provided funding to two community based agencies to implement the Short Term Stabilization Home program (SSH). The program intends to provide crisis services to adults with co-occurring intellectual and/or developmental disabilities (IDD) and psychiatric diagnoses, referred to as dual diagnosis. The SSH program is intended to provide an alternative to institutionalization for individuals with dual diagnosis who are experiencing a behavioral crisis. The SSH program provides coordinated behavioral and psychiatric services to individuals with dual diagnosis in a community setting for a period of 30 to 90 days. An evaluation of the implementation and performance of the program will be conducted by a research team at the University of Illinois at Chicago's Department of Disability and Human Development. Two professionals involved in the implementation of SSH, a Licensed Professional Counselor (LPC) and an administrator of one of the two contracted agencies, were interviewed prior to the start of the evaluation study. Preliminary pilot interviews with key stakeholders can reveal information that researchers may not have considered in the design of an evaluation, and provide them with an opportunity to modify data collection procedures and materials. The preliminary interviews provided insights into the barriers and facilitators professionals experienced during the process of setting up SSH. Both interviews served to inform the design of the evaluation. Insights resulting from the interviews provided valuable information that assisted in the design of the questions for the focus groups with key stakeholders of SSH.

295. Zumach, Kate and Sereno, Paul C.

Documenting Visualization and Decision-Making Methodology in 3d Reconstruction of Early Cretaceous Basal Squamate Norellius nyctisaurops.

Graduate/Professional - Biomedical Visualization

Digital reconstruction of fossils, now commonplace in the paleontological literature, are often presented as a fait accompli with little documentation regarding the many decisions made along the way and with little or no access to these stages or the digital reconstruction itself. Using the skull of Norellius nyctisaurops, I document the complex process of reconstruction with standardized forms using new cloud based software to create a multi user up-loadable database for sharing methodology and decision-making of the reconstruction. The only known specimen of Norellius nyctisaurops, regarded as a basal gekkonomorph, is a skull approximately 20 mm in length that was reconstructed based on a microCT data. Several visualization tools were used for this reconstruction. Materialize Mimics was used to interpolate MicroCT data of the original skull into 3d models. These 3d models were then reconstructed in ZBrush. The animation was done in

3ds Max and Adobe After Effects. The animation displays the original skull, reconstructed skull, the brain endocast, reconstruction of vestibular system, and path of the internal carotid arteries. The remodeled skull models were prepped and 3d printed. The database workflow was designed and created. The forms and reports from the database were submitted to the reconstruction team for approval. The resulting deliverables consist of 3d printed skull, a 3d animation, and a collaborative database documenting decision-making. The 3d models are available for handling and evaluation of the skull while preserving the original fossil. In conclusion, the methodology used in this reconstruction gives insight on how 3d programs are used in the creation of a reconstruction and how accuracy and communication between the paleo-artist and content expert can be efficiently documented with a new form of checks and balances.

296. Withdrawal

Impact Day

Poster/Oral/Oral Creative Presentations

301 Anderson, LaQueal; Shin, Pearl; Vavra, Sonia; Diaz, Cesar and Gallardo, Felipe

Spurring Growth through UIC Radio

Presentation Type - Oral Presentation/Impact on Self

Undergraduate - Center for Student Involvement

Launched in 2000, UIC Radio is the only form of student media at the University of Illinois at Chicago. Thus, its role of providing a platform for expression and connection is extremely vital to the UIC community. UIC Radio seeks to be a place where students can freely express themselves and engage in topics that touch students' lives daily. UIC Radio expanded past its streaming platform to also include a blog that provides another format to either expand on ideas and concepts debuted in broadcast shows or provide more avenues for the expression of thought. Since UIC Radio is a student-led organization, we, as student leaders, push the organization forward and often glean great, transferable life lessons from our work. We believe our work with UIC Radio has spurred personal development as we navigate working with others and working through complex UIC policy to implement our vision for UIC Radio. We also argue that through our work on the radio station, we provide a platform for ideas and safe spaces as well as a launching pad for UIC and local talent proving UIC Radio to be a vital service to the UIC community. Finally, many of the UIC Radio student leaders seek to go into broadcasting, mass communication, or artist management for their careers. Thus, our work with UIC Radio has helped us hone our talents and skill sets, network with professionals already doing the work we hope to do, and well placed us to succeed in our next steps into the media world after we matriculate from UIC.

302 Awad, Reham

To What Extent is HIPAA Adequate Enough to Protect Personal Health Information in Retail Pharmacy?

Presentation Type - Poster/Impact on Self

Undergraduate - Honors College

HIPAA is a very important law that was established in 1996 for the purpose of helping people keep existing health insurance, controlling the cost of care, and to keep medical information private; however, the question in place is whether HIPAA is an adequate enough of a law to protect personal health information in the retail setting of a pharmacy. In order to analyze the application of HIPAA in

the pharmacy, I will provide arguments and counterarguments looking closely at the privacy, security, and breach notification rules of the law. These breaches stem from the lack of enforcement of the HIPAA law rather than the style in which it was written. Moreover, HIPAA is written adequately enough to protect patients' personal information. To conclude, HIPAA is a well-written law; however, the problem lies not in the words of the law but in the enforcement of the law.

303 Baezan, Cristian

Diminishing Machista Mindsets In the Community

Presentation Type - Poster/Impact on Self

Undergraduate - ED222

The purpose of this project is to examine the role of machismo in my Latino community and society at large and to critique the aspects of manhood as it is experienced by heterosexual men like myself. As a first generation Latino undergrad student at the University of Illinois at Chicago with a Human Development and Learning major, I believe that it is fundamental to talk about crucial and often neglected topics like machismo. While some people believe that machismo only takes place in the Latino culture, it is actually a matter that affects both men and women at the international level. Now, this project will detail the connections from the ED 222 Gender, Sexuality, and Education course along with programs through my fraternity, Lambda Theta Phi Latin Fraternity, Inc. Through Professor Hathaway's course, I was exposed to the idea that men play a dominant and superior role in society and how a man educating a man is often more effective, which then challenged me to think about my advantageous ability to change others' viewpoints; impacting my community and myself. Therefore, my fraternity brothers and I collaborated with other organizations on campus by generating an event series of workshops and discussions this semester called, "Marching Away from Machismo" that incorporated both male and female perspectives around masculinity and machismo. Our "Men of Color, Mental Health and Masculinity" event which was a collaboration with Reimagining Masculinities Initiative on campus was one of our many successful events to spread awareness on machismo. In short, this experience has not only challenged me as a student but as a heterosexual man to think broadly of my male, straight privileges. I know I play a vital role and have a responsibility in educating to shift mindsets and experiences of other men to be inclusive and act as feminists.

304 Curuk, Etem; Lee, Yunju and Aruin, Alexander S.

The Effect of the Discomfort-induced Insole on Symmetry of Turning in Healthy Individuals

Presentation Type - Poster/Impact on Community

Grad/Professional - Physical Therapy

Turning while walking is a common activity that corresponds to 45% of all steps taken daily. It might be risky maneuver associated with falls experienced for example by stroke survivors who commonly exhibit asymmetry of stance and gait. Achieving symmetrical stance and gait is an important goal of rehabilitation. The purpose of the study was to investigate the effect of a textured insole (D-insole) on symmetry of turning. Nine healthy young individuals performed turns to the right while walking with no insole, immediately after the insole was inserted in the right shoe, and after of walking for six minute with the insole. Motion Analysis system was used to obtain the displacement of pelvic markers and duration of turning, and visual analog scale was used to measure the perceived level of discomfort. The displacements of markers were used to calculate the symmetry index. Using the D-insole was associated with increased level of perceived discomfort ($p < 0.05$). Moreover, using the D-insole was associated with changes in the displacement of two pelvic markers and larger asymmetry index immediately after insole was inserted in the right shoe ($p < 0.05$) as compared to no insole condition. When the D-insole was used, the duration of right turning increased immediately after the insole was inserted ($p < 0.05$) and after walking with the insole for six minutes. The results indicate that using the D-insole might create asymmetry of turning in healthy individuals. The outcome provides a background for future studies focused on using the D-insole to minimize the asymmetry of gait and turning commonly seen in individuals with unilateral impairment.

305

Desrosiers, Alexandra; Dommaraju, Sunil; Lawrinson, Danielle and Ocampo, Sabina

Student Activities Board: Building Connections and Promoting an Engaged Community

Presentation Type - Oral Presentation/Impact on Community

Undergraduate - Student Activities Board

As a university that prides itself in having a mostly commuter-population, the campus can sometimes feel disconnected. It is difficult for members of the UIC community to interact with one another and establish numerous positive, impactful relationships. These relationships are vital to a UIC student, as they help build social, academic, and professional ties that aid the student's college experience and help them gain resources and opportunities to further their goals. The Student Activities Board (SAB) at the University of Illinois at Chicago attempts to tackle this predicament. SAB's core mission is to plan interactive, entertaining, and educational events that bring the UIC community together and foster the creation

of these key relationships. SAB's impact on the community can be seen by the type of events that are planned and the type of people that we engage. For example, last Fall, SAB hosted an event titled 'Evening with Diane Guerrero'. At this event, speaker Diane Guerrero discussed various problems with current immigration rhetoric and proposed steps that we as individuals can take to address the issue. Through events like these, we highlight important topics that are extremely relevant to the UIC community and foster conversations surrounding these topics. In engaging the UIC community, SAB members develop vital leadership skills as they work through the problems and challenges that arise when planning these high impact events. Our members are seen taking initiative when planning our events by contacting necessary organizations, developing back-up plans when the initial idea seems unfit, and adapting to the physical environment of the event. Through the event planning process, the members gain tools that promote careers in relevant fields like student affairs. Personally, we have seen ourselves become professional leaders, take initiative for the things we care about, and more effectively connect with our campus.

306 George, Edgar; Griffith, Garrett and Baynard, Tracy

Career Development and Research Experiences through the Integrative Physiology Laboratory

Presentation Type - Poster/Impact on Career Development

Undergraduate - Kinesiology

I have been an Undergraduate Research Assistant in the Integrative Physiology Laboratory (IPL) for the 2016-2017 academic year. To expand my experiences in preparation for medical school, I became a Research Assistant in the IPL to help strengthen my candidacy for medical school through extensive research experiences. In doing so, I am now well-versed in the area of clinical human research having assisted in a wide-array of studies. Human studies assisted with: GH (effects of a novel exercise training program on psychosocial outcomes, as well as heart and blood vessel function); SAFE (effects of resistance exercise in older and younger men and women); OBESITY (effects of exercise on vascular control in obese and lean individuals); and NIHFT (effects of resistance training in type 1 diabetes). Being an undergraduate Research Assistant in the IPL has truly helped me over the last year in many ways, in particular through career development. As a prospective medical school student, it is important to expand my knowledge of the health care field in order to better understand the different areas of the field. Additionally, it was also important for me to obtain hands-on experience to expand my professional development, so that I have a deeper understanding about the common equipment found in a clinical setting, what they are used for, and what the results mean. Every time I visited the IPL, it was something different. No two days were the same and that was something very critical to my experience. Additionally, the IPL has allowed me to work in close

contact with patients of different clinical populations, thus expanding patient interactions, and increasing my knowledge of patient bedside etiquette. Overall, the IPL has impacted my career development by making me more of a well-rounded and competitive candidate for medical school.

307 Goyal, Nikita; Lee, Yunju and Aruin, Alexander S

The Effect of a Cognitive Task and Finger Touch on Standing Balance Control

Presentation Type - Poster/Impact on Community

Grad/Professional - Physical Therapy

Postural sway during standing is commonly used to describe balance control. Past studies have shown that light finger touch applied to an external stable object reduces postural sway in standing. The purpose of this study was to investigate the effects of light finger touch combined with cognitive task on postural sway in standing. A group of young healthy individuals participated in the study. First, baseline measurements of their ability to perform cognitive task were obtained in sitting. Then, the participants stood on the force platform with no finger touch (NT) and with light finger touch (FT) applied to an external stable object. Both the tasks were performed with eyes open (EO) and closed (EC) and with and without a cognitive task. The cognitive task consisted of counting backward from a randomly chosen three-digit number. Center of pressure (COP) displacement was calculated and analyzed. When light touch was available, body sway was reduced which is consistent with previous body sway studies. Furthermore, we found that the cognitive task reduced postural sway as compared to standing with no cognitive task. The study outcome showed that postural sway during stance decreases when the subjects apply a light finger touch and perform cognitive task. This suggests that dual tasks do not necessarily lead to increase in postural sway. Further studies will determine whether a cognitive task combined with light finger touch could improve balance control in older adults with cognitive impairment.

308 Haque, Saman

Assessment of Quality of Life Measures for Juvenile Probation Officers

Presentation Type - Poster/Impact on Self

Undergraduate - Applied Psychology

The Cook County Juvenile Probation Department was the first entity to view juveniles through a different lens, rather than grouping them into the same system as adults. This was a huge step for the justice system in America, because it established the idea that juvenile need to be treated differently when committing a crime. Logically, those

who chose to work within this new domain, also had to understand that they were working with a different population and need to tailor their treatment to this group of clients. The Juvenile Probation Department works with their clients to best address the issues through treatment, counseling, and any resources that will help in creating behavioral changes. Juvenile probation officers however deal with an inordinate amount of stress related to working with a population that has traumatic experiences, do not use logical reasoning skills, and are in an environment out of their control. This role of “helper” that juvenile probation officers assume, is often the reason for compassion fatigue, burnout, and influences job satisfaction. Using the ProQOL Survey, developed by Dr. Beth Hudnall Stamm, one can assess professional quality of life. Through this survey, distributed at The Cook County Juvenile Probation Department, one can develop ideas further about the factors affecting burnout rates, job satisfaction, and compassion fatigue. Not only that, but it can be a reason to pursue the development of preventative measures to deter the negative effects on juvenile probation officers when playing the role of “helper” in the workplace.

309

Harris, Jasmine; Becker, Marrisa and Shippy, Scott

Determination of Primary Amines in Hemocrit and Plasma Samples of Drosophila Melanogaster

Presentation Type - Poster/Impact on Career Development

Undergraduate - Liberal Arts and Sciences Shippy Lab

The fruit fly has long been a common biological model largely due to the ease of genetic manipulation and homology to human disease. The measurement of amino acid content in the hemolymph or blood of the fruit fly provides a direct measure of fly physiology. Hemolymph in drosophila is a blood-like fluid, composed of plasma and hemocytes. While it is known that hemolymph is rich in amino acids, it is unclear whether amino acids from hemocytes contribute significantly to observed hemolymph amino acid levels. In this project 6 amines were quantitatively determined using capillary electrophoresis (CE) in samples of hemolymph plasma and a hemocrit-enhanced fraction collected from female drosophila Melanogaster. A volume of 27 nL of hemolymph was extracted from an incision at the second tergite of 5 flies using a 14 mm long 50 micron inner diameter capillary. Capillary action collected hemolymph was spun in a centrifuge tube and diluted with 1 microliter of drosophila ringer. The hemocrit content was centrifuged to the bottom of the tube. Top and bottom halves were collected for derivatization with 3-(4-carboxybenzoyl)quinoline-2-carboxaldehyde and capillary electrophoresis analysis. Successful cell separation was confirmed independently by flow cytometry and microscopy. Peak heights for amines were compared to a calibration curve collected from known amine quantities, and concentrations were determined. Though the profiles were visually variable, it was found that there were no statistical differences between amino acid compositions of hemolymph plasma and hemocrit when t-tests were conducted.

310 Hernandez, Celina

Enrolling but Not Graduating: Retention Among Latino College Students

Presentation Type - Poster/Impact on Community

Undergraduate - Sociology

For Latino/a students, graduation rates lag behind college enrollment rates, suggesting that not all students that enroll in college actually graduate. For instance, while 59% of white students graduated with a bachelor's degree or higher in 2012, only 9% of Latinos/as graduated that same year (Krogstand and Fry, 2014). Previous research suggests that factors such as mentoring and support from family and peers contribute to the successful retention of Latino/a students in college; however, these analyses rarely include qualitative data from students themselves, such as their perspectives on their education. Thus, we have little first-hand knowledge from Latino/a students who do not graduate from college. This study attempts to fill this gap in the literature by exploring the experiences of first-generation undergraduate Latino/a students at the University of Illinois at Chicago (UIC) who left the university after their first year of college. Participants were asked a series of questions about their departure from UIC. These in-depth interviews were then transcribed and findings are discussed in terms of emergent themes.

311 Hathaway Miranda, Heather

Teaching Gender & Sexuality in Education as a Latina and Survivor of Domestic Violence

Presentation Type - *Oral Presentation/Impact on Self*

Grad/Professional - ED222

The purpose of this Impact project is to give a Latina face to surviving domestic violence and to empower others to claim their space by using personal narrative. Through a LatCrit lens combined with Feminist Theory, as a full time PhD student and sole Instructor of ED 222: Gender, Sexuality & Education, I have had to balance my domestic violence survivor role with that of an educator incorporating all intersections of gender, sexuality, sexual orientation and other crucial aspects of identity such as race and ethnicity in the course syllabus and my teaching. My aim is to open dialogue about surviving various forms of violence while pursuing a college/university education and juxtapose that with being an educator. Standing at the front of the classroom and drawing upon the language of bell hooks to be an educator that is willing to do what I ask of my students, I have incorporated my story throughout the semester. One key assignment for my students is "The Story of You" in which they tell an autobiographical story of their experiences with

gender, sexuality, and sexual orientation. Therefore, I have done the same, identifying myself as a survivor as well as offering tips for being an ally to victims of various forms of violence. To assist my students and others to embrace an attitude and plan of action as an ally for survivors of various forms of violence I revisit and encourage them to play an active role to Break the Cycle of Violence in the UIC community throughout the course, assignments, and conversations outside the classroom. In the end, not only do my students hopefully benefit but I continue to strengthen in my journey of survival because of sharing.

312 Herz, Amy

Student Hunger Project

Presentation Type - Poster/Impact on Community

Undergraduate - Math and Computer Science

UIC is aware of the fact that there are students on campus that may be homeless or in need of basic amenities such as water. The Student Hunger Project undertook the task of locating all helpful utilities on campus such as water fountains, microwaves, vending machines, and eating areas and made the information available to anyone visiting UIC's campus on its online map. In addition as a computer science major, I decided to take the opportunity to learn about Geographic Information Systems, (commonly known as GIS) to create a floor-by-floor detailed map of these amenities within UIC's more popular buildings. This presentation will shed light on the fact that there are students attending UIC who could benefit from these free amenities. Another outcome we hope to see is that anyone at UIC can be made aware of the accessibility of refill stations across campus, and this will encourage them to bring reusable water bottles that can contribute towards UIC's climate commitment of being a zero waste campus.

313 Jimenez, Magali

Burden of Asthma in U.S. Veterans: Literature Review

Presentation Type - Poster/Impact on Self

Undergraduate - Undergraduate Research Assistant Program

To summarize and synthesize the literature on asthma and asthma related respiratory conditions as well as risk factors for asthma in U.S. veterans, we searched Pubmed using the key terms: asthma (title) and veteran* (Title/abstract) published since 2002. Articles were included if they were in English, conducted with U.S. veterans, and included asthma or respiratory symptoms as main outcome variables. Nineteen articles were identified based on

this initial search. Ancestry research conducted in the references used yielded 9 additional articles. Overall, 17 articles met the inclusion criteria and are included in this review. Studies on the mortality of asthma were very limited. Studies that examine the incidence of asthma were also limited but showed that the incidence of the disease varies significantly across studies with some studies showing an incidence as high as 6.2% in deployed veterans. The prevalence of asthma and respiratory symptoms in veterans ranges from 3.1% to 8.3% for all, but can be as high as 16.4% in female veterans. The main risk factors that were associated with asthma in veterans include: Deployment location (i.e Iraq/Afghanistan), psychological distress, environmental exposures (Ie.smoke, CO₂), and comorbidities. Despite the fact that veterans must be free of asthma or asthma symptoms since age 13 years to enlist, our findings suggest that the burden of the disease is six times greater in veterans deployed to Iraq/ Afghanistan. With this knowledge, it is imperative for health care practitioners to do thorough health assessments on veterans to identify those with the condition and implement control measures. Furthermore, the etiology of asthma in veterans is an issue that must be studied further to provide the best care for veterans.

314 Johnson, Sharon

Military Sexual Trauma Screening in Race, Sexual Orientation, and Ethnicity

Presentation Type - Oral Presentation/Impact on Career Development

Undergraduate - Hon222

In addressing this problem, the VA is focusing on providing veterans with adequate treatment post-service. The Military Sexual Trauma (MST) screening tool is one such measure taken to identify MST which requires veterans' medical providers to ask all new patients about sexual trauma during their time in the military. Informational articles released by the VA have addressed the fact that sexual orientation, race, and gender may affect the outcome of MST screening(citation pending) . Additionally, past research has identified a significant reporting difference in MST from men and women(Hoyt, Rielage& Williams). This study examined the effectiveness of the military sexual trauma screening tool in identifying a history of sexual abuse in comparison with a physician's identification of such through direct questioning. 60 veterans attending residential and outpatient PTSD treatment at VA clinics were given a paper survey measuring demographic information, military service history, and MST history. This was also cross analyzed with patients' MST status according to the electronic medical record using clinical information from physician visits. Chi squared analyses were used to analyze differences identification of MST by the screen according to gender, race, and sexual orientation. It was found that the current MST screen was more likely to pick up on a history of military sexual trauma in women than in men(chi squared symbol= 8.57, df=1, p.01) and sexual

orientation(chi squared=3.385, df=1, p>.01) minority groups. For future research is needed to identify how to modify the MST screen and physician interactions to encourage better identification of MST in men.

315 Lopez, Yaresi

Kindness Week: A Critical Service Learning Project

Presentation Type - Poster/Impact on Community

Grad/Professional - School Social Work

Traditional service-learning projects help youth develop social-emotional competencies and provide platforms to apply the skills in real-life settings and situations. Critical service learning (CSL) projects expand upon these capacities by introducing a lens of social justice. Participants of CSL projects are challenged to think critically of issues of power, privilege, and oppression and develop creative ways to address them (McKay and Johnson, 2015). At James Shields Middle School, the school social worker and social work intern collaborated with a special education teacher to support a group of 11 students in the implementation of a CSL project. Five girls and six boys from grades 6-8th ages 11-14 were selected as participants for this project. Each of the group members receive instruction in a resource room due to their cognitive and intellectual abilities; and half of the participants struggle with symptoms of autism. These students were specifically selected to develop a school-wide social-emotional learning campaign as an effort to provide leadership roles and further promote equity. Through a series of brainstorming activities – a critical component of CSL – the group identified bullying as a topic for their campaign. The group then developed and executed Kindness Week as an intervention to bullying. As a result of their participation, students reported higher levels of self-esteem and were observed displaying stronger social skills. School administrators and other teachers further reported a positive impact on the school as a whole.

316 Lyle, Christopher

Examining Children's Books and Their Lives

Presentation Type - Oral Presentation/Impact on Self

Undergraduate - ED222

The purpose of this Impact project is to elaborate on the experiences from my ED222: Gender, Sexuality, and Education course as it relates to my current work

and future career. My major is Human Development and Learning and I hope to pursue a career in youth counseling in a school atmosphere. In Professor Hathaway Miranda's course, we had to do an annotated bibliography of children's book and critique them regarding gender, sexuality and sexual orientation. The children's book assignment impacted me in several ways. One, it made me visit my community library for the first time in quite a while. Two, it made me see the difference between my childhood books and popular ones now. Three, it helped me more closely examine my youth worker role. I currently work at an Oak Lawn Park District after-school program for more than 3 years with boys and girls. I oversee one of the schools. I find myself connecting more with the kids and I enjoy seeing them grow up and mature over time. This assignment made me reflect deeply on the messages that our children receive through books and what language I use with them as a male figure. I believe I can have fun with them and be their authority figure, which I believe is an important trait to have when working with young kids. I also coach an 11-year-old travel baseball team. I love working with the boys on the team and now think more carefully who they are as young men. I love seeing kids work through things. I like helping them learn and grow through those tough situations in life and their identity. Whether it be in the classroom, sports field or at home, that is my passion and what I hope to do when I get older.

317 McKay, Tyler Eric

My Experience in the Black Tech Scholars Program

Presentation Type - Creative Presentation/Impact on Career Development

Undergraduate - Black Tech Scholars

As a participant of the African American Academic Network's Black Tech Scholars Program, I have had the opportunity of being a part of something meaningful personally and professionally. What initially drew my interest in being a program scholar was the opportunity of gaining hands on experience in learning various programming languages, while simultaneously building on my professional networks and skills. In addition to these mentioned perks, I have had the privilege of working on two real time digital projects for community based organizations within the Chicago Metropolitan Area. I have benefited through my participation in the UIC Black Tech Scholars in the following areas:

1. Meeting and collaborating with African American undergraduate students of similar mindsets, but from different backgrounds, we have a common goal of learning how to create professional website.
2. Gaining the job shadowing and networking opportunities by visiting different tech companies such as Google and Productive Edge.
3. Obtaining career and professional advice from tech professionals and hiring directors within the field

4. Establish a digital portfolio to showcase my expertise to potential employers and clients
5. Increasing my satisfaction in my collegiate experience at UIC.
6. Granted the opportunity of gaining meaningful employment through my participation within the program.

318 Mitra, Arjun

Ally to Stigmatized Identity Groups: What Does Being an Ally Mean?

Presentation Type - Poster/Impact on Community

Grad/Professional - Managerial Studies

This study broadens our understanding of allies by examining the role they play with regards to employees who carry a stigmatized identity. Allies are employees who assume the role of supporting the success of employees with a stigmatized identity (such as members of the lesbian, gay, and bisexual community or employees with disabilities) to bring their authentic selves into work, and also protect them from the adverse consequences of stigmatized identity disclosure in the workplace. Past research have confounded the term ally with behaviors and beliefs and lack clear consensus on how allies may operate in the workplace. We, therefore, propose a coherent definition of an ally to individuals with a stigmatized identity and generate propositions about the antecedents and behaviors related to the role of an ally in the workplace. We further conceptually tease out the differences between an ally and other similar role-based relationships that occur in a workplace such as friend, mentor, and a high social exchange relationship. Using a deductive approach, we created a measure to capture the core identity of an ally. To test the psychometric properties of our measure such as reliability, factor structure, and scale validity, we collect and analyze data from a sample of 150 undergraduate students from the College of Business at UIC. With this measure we will be able to examine the antecedents and behaviors associated with being an ally in the workplace.

319 Nakamura, Fukutarou and Stuck, Aaron

Campus Housing: A Career in IT

Presentation Type - Oral Presentation/Impact on Career Development

Undergraduate - Campus Housing IT

The Campus Housing IT department is a small team of student employees lead by student employees that offers support to 70 full time staff, 200 student staff and approximately 3000 residents. Our responsibilities include, resolving residents' internet and cable issues, managing the computers used by full time and student staff, communicating network issues to ACCC, maintaining door access lists, managing key boxes for all residence halls, retrieving security camera footage, and training full time staff. In the past two years, our support has extended to other departments. Additionally, the success of our department has extended past the University. For the past eight years, graduates from our department have found successful careers in IT across the country. The past three graduates are currently employed at a major IT consulting firm in the heart of the city.

320 Noriega, Mayte

Story of Me

Presentation Type - Poster/Impact on Self

Undergraduate - ED 222

As a first-generation, Hispanic student at UIC, I believe that culture deeply influences people's perception on gender and sexuality, especially in educational settings. As a psychology major enrolled in ED222: Gender, Sexuality and Education with Professor Hathaway Miranda, I have gained great insight regarding this influence. The autobiographical assignment "The Story of You" was most impactful. The purpose of this project was to examine my educational experiences with gender and sexuality. It pushed me to reflect and resulted in awareness of what and how I learned what I know about gender and sexuality. Mexican culture generally isn't very open about sexuality and often follows stereotypical gender norms. Though my culture's influences have been hard to break from, being a member (and sister) of Delta Psi Alpha Multicultural Co-ed Fraternity, Inc. has helped me learn about the realities of people's different opinions and cultural attitudes about gender and sexuality. This assignment made me realize that the message I want to convey with my future profession was what my fraternity strives for. They embody this by sharing the message of the importance of multiculturalism and the goal to spread awareness about it. It is imperative to educate people that culture may influence and may be a traditional part of their life but the norms do not have to be followed. DPsi helped me through this because of its acceptance of people through all walks of life. The different dialogues that I have shared with my brothers and sisters have made me realize the benefits of these learning experiences as a future educator wanting to work with children. In summation, I profoundly understand as a Hispanic woman now more than ever that people come from all walks of life and being informed and accepting of that is crucial to being a successful educator.

321 Novak, Mackenzie

Career Development through Experiential Learning with the Integrative Physiology Laboratory's Health and Fitness Program

Presentation Type - Poster/Impact on Self

Grad/Professional - Integrative Physiology Lab

The Integrative Physiology Laboratory (IPL) is a research based-facility that integrates exercise and nutrition with a wide range of cardiovascular and metabolic diseases. During my time as a master's degree student, I have had the opportunity to play a role as a graduate assistant in the IPL. The purpose for working in the IPL is to gain the knowledge in exercise testing protocols and apply my experience to the field of exercise rehabilitation. I also gain experience in forming a community health program that will allow individuals to undergo tests during exercise as well as at rest that can serve as an aid to their health lifestyle. My primary role in the IPL is working with the Health and Fitness program, where individuals can receive various types of tests, such as maximal oxygen uptake, dual-energy X-ray absorptiometry scan, resting metabolic rate, and ankle to brachial index and pulse wave velocity. After test completion, I provide an overview of the data collected with the individual. This overview allows them to understand what values will be most important to their exercise training and health interventions. Impact: This experience will help me gain confidence in working one-on-one with clients, which is important for a career in the health field. My career goal is to work in cardiac rehabilitation and help patients through their recovery so they will be able to go about their daily lives and maintain a good quality of life. This experiential opportunity will provide me with further knowledge of the exercise physiology field in administration, interpretation, and consultation, which are important to have when working in a clinical setting.

322 Otoo, Mary

Maternal Perceptions of Child Eye Health in Ghana, June – July 2016

Presentation Type - Oral Presentation/Impact on Community

Grad/Professional - Public Health

The World Health Organization (WHO) estimated that there are 1.4 million cases of child blindness globally. Mothers have a pivotal role in a child's health care because they generally bear primary responsibility for managing children's healthcare needs. Hence, efforts to eliminate childhood blindness should include

mothers. Studies have reported a correlation between mother's knowledge and perceptions and maternal healthcare-seeking behaviors. This study investigates maternal perceptions of child eye problems and non-receipt of eye care in their children's' lives. Women with children under age 15 who attended Unite for Sight (UFS) outreach programs sites across Ghana were surveyed. Data collected from this convenience sample of women were analyzed. Bivariate analysis, multivariate analysis, and logistic regression models were used to assess the association between maternal perceptions of child eye problem and non-receipt of eye care. Among 260 mothers surveyed, 102 reported at least one child with eye problem (39.3%); 28/102 (27.5%) had not had an eye exam. Mothers whose children had not received an eye exam were more likely to perceive no benefits of an eye exam from an eye doctor, (8.6 % vs. 2.1%), and more likely to have more than 5 children (9.2% vs. 3.1%). After adjusting for these factors, mothers who had a child with eye problems were less likely to have children who had not received an eye exam ($R_{\text{Adjusted}}=0.41$, 95%CI=0.32-0.53). Mothers who reported children with eye problems were significantly less likely to have children who had not received eye exams. However, it is concerning that 28% of mothers who reported child eye problems had not brought children for vision care and that only 23% of women whose children had no apparent eye problems sought preventive vision care. Maternal perceptions of child eye health should be examined further to better understand and tailor efforts to eliminate childhood blindness globally.

323 Pandugula, Sumanth Reddy

**Prototypes to Gold - From Working Models to Building Real Software(gold)
Used by Tens of Thousands of People**

Presentation Type - Oral Presentation/Impact on Career Development

Grad/Professional - Student Affairs Technology

As a graduate student in computer science I worked on projects in every course, but I was building only a working prototype/model by the end of the semester that satisfies the project criteria and conveys my understanding of the specific course to the professor. Within no time a new semester starts, and I have new courses and new projects to work on. The old prototypes are no longer used, but this is not how it works in the tech industry. I should build real software projects that will be used by thousands of people for many years. My experience working as a Web Applications Developer at Student Affairs Technology made me ready for this. As a part of my work, I built real software that enhances the experience of faculty and student community at UIC. In 2015 when I first came to UIC, I had to wait for hours in line just to pick up the Chicago Transit Authority (CTA) University Pass (U-Pass). Student Affairs wanted to solve this problem. I along with my supervisor built an application for the ID Center that lets them issue 500 U-Passes an hour. I also worked on a leave management application that makes

requesting/approving leaves for Student Affairs staff the easiest thing. These applications I built will be used for many years (unlike the course projects which were only working models.) Student Affairs Technology provided me the opportunity to enhance my skills as a software developer, learn new tools like .NET, NodeJS, PHP and SQL, I even got to apply my knowledge from the coursework at UIC in both of these applications that improved the performance and usability significantly. My experience at SA Tech added immense value to my profile and helped me land my dream job very early.

324 Peesapati, Meghna; Martinez, Michael; Krol, Jacob and Trandai, Kris

Speech and Forensics: Challenging Social/Political Spheres

Presentation Type - Creative Presentation/Impact on Self

Undergraduate - Speech and Forensics Team

The Speech and Forensics Team at UIC is a new student organization this year that has already made an immense impact on its members and the surrounding community. As members of Speech and Forensics, we compete in public address, interpretation, and limited prep categories. This includes events such as informative speaking, persuasive speaking, dramatic interpretation, poetry interpretation, and extemporaneous speaking. In crafting our speeches, we motivate ourselves to promote a deeper understanding of the issues that we truly care about. For example, one of our persuasive speakers has written a speech persuading his audience, the judges and other college students, to take action against sexual education programs that promote abstinence. He provides statistics and evidence to demonstrate why encouraging abstinence can be hurtful to a community's sexual health and lists tangible solutions that an individual can partake in to develop more well-rounded sexual education programs across the country. Furthermore, one of our poetry interpreters performs various poems that discuss the Hispanic/Latino's changing identity under the new sociopolitical climate, and how we as individuals must accept and cherish the numerous characteristics that the Hispanic/Latino community identify with. By constructing these performances, we promote social justice, and foster personal growth and development. Arguably, all our team members entered the team this year with limited experience in developing high impact speeches. However, after competing in thirteen tournaments weekends this year, our members have not only developed remarkable public speaking skills, but have also developed writing skills that allow for enriching, concise discussion. In this way, we grant students of the UIC community a voice to speak on the political and social issues that affect them the most. Ultimately, we learn how to more effectively communicate about these issues and then engage with community partners to properly tackle these issues.

325 Redfield, Janelle

Impact of Woman 2 Woman

Presentation Type - Oral Presentation/Impact on Self

Undergraduate - Woman 2 Woman

I have been a member of Woman 2 Woman for all four years of my college career, and I can confidently say that it has had a significant contribution to the woman that I am today. This program has not only given me a sense of sisterhood among other Black women on campus, but it has also helped me to perfect my leadership skills and has pushed me to go outside of my comfort zone. As a member of Woman 2 Woman, I have had the opportunity to attend many events that touch on: being a Black woman in today's America, different types of relationships (from professional relationships to personal ones), and physical, mental and emotional health. In addition to providing events for its members, Woman 2 Woman members also are given the opportunity to plan and execute events geared towards our fellow students and community. We participate in many community service events like donation drives and volunteering for high school visits. Lastly, members are taught how to effectively market all of these experiences and other experiences outside of this organization for jobs, graduate school, and internships. All of this has helped me to develop into a woman with strong character, a woman with a sense of responsibility for herself and for her community, a woman with purpose, and a woman who not only leads but is able to follow. Woman 2 Woman is not just another organization on campus. It is a shoulder to lean on, an ear to listen, a sisterhood, a support system, and a family. I am eternally grateful for everything it has given me.

326 Thompson, Shameka

Voting and Irrationality

Presentation Type - Poster/Impact on Community

Undergraduate - Political Science

Why white working class citizens vote against their economic interests has become an increasingly popular topic since publication of Thomas Frank's What's The Matter with Kansas. Voting for Republicans, ordinarily the party of the rich and affluent, seemingly works against their economic welfare and therefore, against what others presume is in their best interests. This paper explores the reasoning behind why these citizens vote the way that they do. I argue that this white working class segment values individualist traits, as illustrated through use of a psychological systems model, which accounts for why they may vote in favor

of a noneconomic interest over material concerns. This psychological model demonstrates how personal factors can override or bypass economic concerns in decision-making.

327 Thomson, Elizabeth

Accessibility, Collaboration, and Dialogue: Implementing Audio Description at a Campus Gallery

Presentation Type - Poster/Impact on Community

Grad/Professional - Disability & Human Development

Approximately 8% of the population 16 years of age and older are blind (ACS, 2014). At UIC, there are 18 students who are blind or have low vision. The UIC Gender and Sexuality Center (GSC), one of the seven Centers for Cultural Understanding and Social Change, has a small art exhibit space. To increase accessibility and fuller cultural inclusion, Liz Thomson (PhD student in Disability Studies) and Jonathan Kelley (Master's student in Museum and Exhibition Studies and graduate assistant for the GSC) worked with various stakeholders to go beyond compliance, and integrate accessibility into two different art exhibits the GSC hosted. To guide our actions, we consulted with some members of the blind and low vision community affirming the philosophy "nothing about us without us" (Charlton, 2000). Additionally, we were self-reflective throughout this collaboration meeting regularly, acknowledging our own sighted power and privilege, and challenging each other's use of language, stereotypes, and biases. For this project, we used the social model and social justice model approach of disability. The social model asserts it is the environment that needs to change (Oliver, 1996). Furthermore, Castaneda & Peters (2000) combines the minority group model and the social model to focus on the elimination of "ableism" and the right for everyone to have full and active participation in their education experience – social justice model. For Thomson and Kelley, we agree that the disability community is part of human diversity, and people who are blind or have low vision have the right to have the same academic and cultural opportunities and experiences at UIC. We want to share what we have learned with the other art and cultural gallery spaces on campus so that they may implement audio description to not only provide accessibility, but to enhance everyone's art and cultural experience.

328 Vazirian, Saeed; Babu, V.; Perkins, G. A. and Lysakowski, A

Assessing the Asymmetrical Distribution of Crista Junctions in Tubular Mitochondria Located Adjacent to a Post-Synaptic Density of a Vestibular Hair Cell Ribbon Synapse

Presentation Type - Poster/Impact on Career Development

Undergraduate - Biology

Electron microscopic tomography (EMT) reveal that two inner portions of mitochondria articulate with each other via narrow tubular-shaped openings known as crista junctions (CJs) (Song et al., 2013). For our study, we predicted an asymmetrical distribution of crista junctions in mitochondria with tubular cristae located in the calyxplasm of a vestibular calyx ending adjacent to a post-synaptic density at a ribbon synapse in a vestibular hair cell. Synaptic ribbons are the form that synapses take in retinal photoreceptors and inner ear hair cells, consisting of synaptic vesicles and an electron-dense “ribbon” or docking site, and they are the location of vesicle fusion during active neurotransmitter release (Schmitz et al., 1996). Using the EM tomograms and 3-D imaging software called IMOD, qualitative and computational data can be obtained on for tubular cristae, CJ numbers, shape, distribution and even the density of the matrix (Tasel et al., 2016). With these tools, we hypothesized that a statistically significantly larger number of CJs will appear on the sides of mitochondria near the ribbon synapse, as opposed to away from it. Furthermore, we expect metabolic activity at the synapse to also be higher, as ATP is required for signaling activity of the ribbon synapse provided by the tubular cristae (Perkins and Ellisman, 2007). Calculations, with the help of the IMOD software has helped us bear out these assumptions, using information on the number, total volume and other details on CJs of vestibular hair cells (Tasel et al., 2016) (Song et al., 2013).

329 Wyatt, Deja

Student Affairs HR Martix and Surveys

Presentation Type - Oral Presentation/Impact on Career Development

Undergraduate - Student Affairs Human Resources

The purpose of my assessment is to identify areas of improvements for Campus Auxiliary Services' current processes and ways to provide more efficient and valuable service. Three of the main functions are Onboarding, Customer Service, and Exit Interviews. Onboarding is the process of getting the new hires familiar with the organization and understanding their roles more in depth. Most organizations consider customer service as the external consumers that are

receiving a good or service, but for HR, the customers are the employees. Lastly, an exit interview is an opportunity to learn where the organization can improve and gain a unique perspective on performance and employee satisfaction. I will explore options to better improve these three areas. Improvement in these areas will lead to higher retention rate, better customer service for external customers, innovative ideas and processes, and better relationships between employees and HR.

330 Xie, Katherine

Assessment of Health Literacy within an Urban Population

Presentation Type - Poster/Impact on Community

Undergraduate - UIC-Cook County Research Program

It is well noted that the population of patients that are admitted to the Cook County Emergency Department (ED) is very diverse, both racially and culturally. A consequence of such diversity is the language barrier. Regarding spoken language, many patients are not native English speakers, and thus providing appropriate care demands the use of either on-site translators or phone interpreters. Of these non-native speakers and a large subset of native English speakers, written language poses another barrier to effective care. As patients are discharged, they are given a sheet with instructions on taking medications, making follow-up appointments, etc. An inability to comprehend the written English language complicates care, as appropriate follow-up steps are not taken. Oftentimes as a result, these patients return to the ED within days or weeks and fall into a perpetual cycle of battling holistically inadequate care. In order to improve health outcomes, measures need to be taken to change medical practices with low health-literacy patients. To do so, the percentage of patients that fall into low, marginal, and functional health literacy must first be determined. In this study, we use the seven-minute sTOFHLA (short Test of Functional Health Literacy in Adults) as a determinant of health literacy. Assessed in conjunction with demographic data – ie. age, sex, race primary language, highest level of education obtained – we are able to gather essential data on the health literacy of the population of patients that visit the Cook County Emergency Department, before utilizing this data in future projects to improve health outcomes. This is the first study of its kind to be conducted in a large, urban ED.

331 Yabe, Manako

Campus Safety App

Presentation Type - Oral Presentation/Impact on Community

Grad/Professional - Disability and Human Development

When I joined University of Illinois at Chicago (UIC) in Fall 2014, UIC did not have a campus safety app or text messaging, but only voice emergency calling to the campus police. Text messaging was not just for people who are deaf and hard of hearing. This service also appealed to individuals who did not have hearing loss, such as those who are English as second language speakers, international students, and senior citizens who had acquired a hearing loss over the years. The Federal Communication Commission and the police officers recognized that there were emergency situations where a phone call was not safe, such as domestic violence situations or a campus shooter. It was reasonable to allow individuals to silently text emergency services to protect our safety. To improve our campus safety, I conducted my independent study to measure students', faculty's, and staff's willingness to pay for campus safety app and emergency texting. As a result, a total of these groups' values of the app was at least \$30,205 per year. Their values were three times larger than the actual annual fee of the campus safety app, and the app was cost-effectiveness compared to blue light emergency towers. In addition, the total values of the three groups' willingness to pay were \$7,736 per year, larger than the lowest implementation costs of text-to-911. This study's results strongly pushed me forward to propose the campus police to introduce the campus safety app at UIC. My proposal came true. In Fall 2016, UIC launched the campus safety app for the first time.

332 Zoha, Wardah

HCV Screening and Linkage to Care in an Urban Academic Health System

Presentation Type - Poster/Impact on Community

Undergraduate - Project HEAL

Hepatitis C is a disease caused by a virus that infects the liver. This virus, referred to HCV for short, is known to infect an estimated 2.7 million people in the United States alone. It has become known as the “silent epidemic”, because an individual can be infected for 30 or more years and be absolutely unaware that they are infected. Patients with chronic HCV infection are at risk of developing cirrhosis, hepatocellular carcinoma, and extra hepatic complications. Patients born during 1945-1965 comprise about 75% of the current HCV cases in the United States.² In recent years, it has become apparent that individuals being screened and diagnosed with HCV are not experiencing equality when it comes to treatment. There are similar descriptive qualities that are associated with people who are able/unable to receive treatment for hepatitis C. The purpose of this research is to determine the descriptive qualities that are associated with people who receive Hepatitis C

treatment. This research also aims to narrow down to what stage in the treatment process people begin to decline and if they are associated to similar descriptive qualities. At the last stage of hepatitis treatment, this research aims to determine which descriptive qualities are seen the most amongst the patients and which are seen the least. We hypothesize that there will be a significant decline in the number of individuals that get screened and then are seen once again for treatment. Of the ones that are seen for treatment, there will be clear demographic qualities that are popular amongst the treated individuals versus the ones that did not receive treatment.