

CRITICAL INQUIRY & ENGAGEMENT



UNDERGRADUATE RESEARCH & ENGAGEMENT SYMPOSIUM
LOYOLA UNIVERSITY CHICAGO

APRIL 13TH, 2019



Today we celebrate student scholarship and engagement in a variety of ways! During the Weekend of Excellence, this symposium is Loyola's annual celebration of student scholarship, including research, community engagement projects, and scholarly, creative works conducted by Loyola University Chicago undergraduate students. On behalf of the Loyola Undergraduate Research Opportunities Program (LUROP) within the Center for Experiential Learning, we welcome you to the 2019 Undergraduate Research & Engagement Symposium.

The Center for Experiential Learning has facilitated this symposium for over a decade, and this year's symposium theme is *Critical Inquiry and Engagement*, demonstrating the ongoing process of reflection on action in the co-creation of knowledge. As a celebration of students' scholarly work, our symposium provides space for critical interrogation into and reflection upon many disciplinary topics. Such scholarship actively animates Loyola's mission to "expand knowledge in service to humanity through learning, justice, and faith." Through student research projects, community-based learning projects (from service-learning courses or academic internship courses), and reflective learning portfolios, students demonstrate their knowledge, skills, attitudes, and values in formation as a result of the Loyola University Chicago Jesuit education.

During each summer and academic year, Loyola undergraduate students spend hours inside and outside of their classrooms, mentored by faculty and staff, to conduct hands-on, original research and to lead community-engaged projects. These scholarly projects not only engage learning differently, but also transform student perspectives, as knowledge is generated or co-created and communities are strengthened. The breadth of multi-disciplinary projects are presented today in posters, oral presentations, community engagement projects, and student learning portfolios alongside original research projects. We encourage you to take advantage of the wide array of student presentations in all sessions of the Undergraduate Research & Engagement Symposium.

We thank the faculty, staff, and community partners who serve as mentors to our students – your work in guiding student learning is significant, and we appreciate your time, energy, and commitment! We are very grateful to the faculty, alumni, staff, campus partners, and graduate students who are serving as evaluators to provide feedback this year, ensuring an enriching, learning experience for our undergraduate students.

For more information about Loyola's Center for Experiential Learning, a center for engaged teaching, learning, and scholarship, which facilitates high-impact, engaged learning opportunities for students across the curriculum, visit us at www.luc.edu/experiential. To learn more about the undergraduate research program (LUROP), please visit www.luc.edu/lurop. We hope you enjoy the scholarly work and culminating projects of our students!

In Service,

Patrick M. Green, EdD
Executive Director, Center for Experiential Learning
Clinical Instructor, Experiential Learning

SCHEDULE

Poster Presentations: Session 1 11:00AM-12:30PM
(Mundelein Auditorium)

Undergraduate Research in Dance Performance 11:30AM-12:15PM
Undergraduate Research in Dance
(Mundelein 409)

Oral Presentations..... 12:45PM - 2:15PM
(Mundelein Classrooms, Floors 2-5)

Poster Presentations: Session 2..... 2:30PM-4:00PM
(Mundelein Auditorium)

Recognition Ceremony 4:15PM - 5:00 PM
(Palm Court, Floor 4)

- ◆ *Outstanding Loyola Undergraduate Researcher Award*
- ◆ *Langerbeck Award for Undergraduate Research Mentoring*
- ◆ *Graduate Student Mentor Award*
- ◆ *Hayes Award for Advising and Mentoring*
- ◆ *Loyola University Libraries Undergraduate Research Paper Award*
- ◆ *Learning Portfolio Reflection Awards*
- ◆ *Community Engagement Award for Social Justice*
- ◆ *Community Engagement Award for Innovation in Sustainability*
- ◆ *Community Engagement Award for Impact*
- ◆ *Community Engagement Award for Solidarity*

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LOYOLA UNDERGRADUATE RESEARCH OPPORTUNITIES PROGRAM (LUROP)

In addition to hosting the 2019 Undergraduate Research & Engagement Symposium as part of the Center for Experiential Learning (CEL), the Loyola Undergraduate Research Opportunities Program (LUROP) offers guides for external research opportunities, workshops on research and presentation skills, and more. You can find these resources at www.luc.edu/lurop. LUROP also coordinates or supports nineteen undergraduate research fellowships. Many, though not all, of the students presenting at the Symposium received support from these fellowships.

Biology Research Fellowship Program

The Biology Research Fellows Program funds long-term research projects under the direction of a faculty mentor in the Department of Biology. Students work for two years on their respective projects during the academic year and in the intervening summer.

Biology Summer Research Fellowship Program

The Biology Summer Research Fellowship funds summer research projects under the mentorship of a faculty member from with Department of Biology.

Carbon Undergraduate Research Fellowship

The Carbon Fellowship offers a full two-year, interdisciplinary research opportunity for science and math majors to work closely with two faculty mentors. This program is designed for students who plan to pursue research in graduate or professional schools.

Carroll and Adelaide Johnson Scholarship

The Carroll and Adelaide Johnson Scholarship offers rising juniors a two-year scholarship to support a research project on women, leadership, and social justice under the mentorship of a Loyola faculty member.

Center for Urban Research and Learning (CURL) Fellowship

The CURL Fellowship facilitates involvement of students in collaborative research projects with community-based organizations, social service agencies, health care providers, businesses, and government. Fellows are active participants in efforts to improve the quality of life of all members of the Chicago metropolitan community.

Community Research Fellowship

The Community Research Fellowship connects undergraduate students with community partners and faculty members to participate in research. With the community partner and faculty member serving as guides, this unique fellowship allows students to participate in community-based research *with* the community.

Institute of Environmental Sustainability (IES) Undergraduate Research Fellowship

Formerly known as the CUERP Fellowship, the IES Fellowship is for students to conduct interdisciplinary research on issues related to unsustainable natural resource uses in the greater Chicagoland region. The Center encourages research projects to combine elements of ecosystem structure and function, impacts on human health, public policy, behaviors, and other environmental factors.

Interdisciplinary Research Fellowship

The Interdisciplinary Research Fellowship connects undergraduate students with two faculty members in different disciplines on a research project that engages multiple disciplinary lenses. In an effort to foster interdisciplinary collaboration, this fellowship was created to provide a pathway for students to engage directly in interdisciplinary research. With support from two faculty mentors from different disciplinary perspectives, students are encouraged to engage in research that demonstrates how knowledge creation is enhanced with multi-disciplinary approaches.

The Joan and Bill Hank Center for the Catholic Intellectual Heritage (CCIH) Undergraduate Research Fellowship

The Joan and Bill Hank Center for the Catholic Intellectual Heritage (CCIH), in support of the Catholic Studies

minor, offers a research fellowship to undergraduate students who are currently enrolled in the Catholic Studies minor program. This fellowship is dedicated to support for CCIH-funded faculty research projects, as well as CCIH's international research projects.

Mulcahy Scholars Program

The Mulcahy Scholars Program supports over 70 College of Arts and Sciences majors in the hard sciences who are working on an individual research project with a faculty mentor, serving as a research assistant, or engaging as a member of a collaborative research team to support ongoing faculty projects throughout the academic year.

Provost Fellowship for Undergraduate Research

The Provost Fellowship supports over 80 undergraduate students in any academic discipline across the university conducting research with the support of a faculty mentor.

Research Mentoring Program (RMP)

This program is designed to partner graduate students who are working on their dissertation with undergraduates who are interested in participating in research. This summer program is designed to support doctoral students in their dissertation research while providing an opportunity for undergraduates to learn more about graduate studies and graduate-level research.

Ricci Scholars Program

The Ricci Scholars Program is an innovative research and cultural immersion program organized around the theme of the meeting of East and West. The program awards selected students with scholarships for travel, research, and exploration during a junior year of study divided between two of the world's most important cities: Rome, Italy, and Beijing, China.

Rudis Fellowship Program

The Anthony and Mary Rudis Fellowship provides scholarships to students whose research focuses on the comparative study of constitutions. Recipients of the scholarship will write a 20-25 page research paper during the academic year under the guidance of a faculty member in the Department of History or the Department of Political Science.

Social Innovation/Social Entrepreneurship Fellowship

This fellowship is designed for undergraduate students who are developing a social innovation project or social entrepreneurship venture.

Social Justice Research Fellowship

The Social Justice Research Fellowship support students conducting faculty-mentored research that explores issues of social justice or contributes to social justice.

Women in Science Enabling Research (WISER)

The oldest undergraduate research fellowship at Loyola, WISER, is designed for undergraduate women seeking to explore research science, work closely with faculty, learn how laboratory work is conducted, and build a sense of community.

RESEARCH POSTER PRESENTATIONS: SESSION 1

11:00 AM - 12:30 PM

♦Poster 1♦

Analyzing English Language Learners' Motivation to Participate in Classroom Discussion

Presented by Camila Wever; Provost Fellowship

Supported by Dr. Perla Gamez, Psychology; Holly Griskell, Psychology

Despite previous research focused on student participation on classroom discussions, minimal past research has described what motivates students to participate in discussion. The main objective of the study is to examine Spanish-speaking English language learners' motivation to participate in classroom discussion. We are interested in understanding what motivates ELLs to participate in discussion and how their motivation is related to how much they talk during classroom discussion. To measure student participation, we will describe ELLs number of spoken phrases through running descriptive analyses. This will provide information that describes how often students tend to participate in discussion.

♦Poster 2♦

Capacity Of Christensenellaceae To Activate Wnt Signaling In The Absence Of Loss-Of-Function Mutations In APC

Presented by Aarifah Bandealy

Supported by Dr. Michael Burns, Biology

Though we know that the composition of microbial communities within the human body are known to have a profound effect on numerous diseases, there is much to learn about the mechanisms by which the gene and the microbiota composition affect human diseases. The study of various microbial community patterns within colorectal cancer mutations, allow us to learn about how cell signaling pathways involved in oncogenesis may be affected by their varying abundances. In this study, the bacteria *C. Minuta*, known to have varying abundances in colorectal cancer tissue with a mutation in the Adenomatous Polyposis Coli gene, was studied.

♦Poster 3♦

France Foreign Policy in North Africa: A New Form of Colonialism

Presented by Lejla Alibasic; Provost Fellowship

Supported by Dr. Tavis Jules, School of Education

This project, using Tunisia as a case study, examines France's continued influence in post-colonial settings by seeking to understand the implications of how France's foreign policy has changed in its former colonial countries after the Arab Spring. This research seeks to understand whether France's donor commitments perpetuate a sense of dependency on the aid recipient. Theoretically, it draws on economic dependency literature to explain the continued unequal economic relationship between the world powers and their former colonial subjects. Methodologically, the research uses content analysis of France's external development policies to identify if France's discourse changed throughout Tunisia's transition to democracy.

♦Poster 4♦

Rebuilding a Community

Presented by Olivia LaRocco

Supported by Ruth Gomberg-Munos, Anthropology; Dan Swinney, Manufacturing Renaissance

Over the last two years, I have performed ethnographic research in the Chicago Lawn neighborhood, following former Nabisco workers after their layoffs. Interviews were performed asking workers about the effects of job loss on they themselves, their families, and subsequently, their communities.

♦Poster 5♦

Foreign aid and World Polity: How foreign aid diffuses international norms: U.S and Tunisia in the aftermath of the Jasmine Revolution

Presented by Andy Soto; Interdisciplinary Research Fellowship

Supported by Dr. Tavis Jules, School of Education; Dr. Mathew Williams, Sociology

In studying international norm diffusion, this project looks at the impact of bilateral relationship between Tunisia and the U.S in the post-Jasmine Revolution. This project, seeks to fill the gap in literature on the role that foreign aid, as a tool, plays in the diffusion of international norms asks: How does foreign aid serve as diffuser of international norms and models? Theoretically, the study draws on World Society theory, paying attention to foreign aid to explain how organizations, states, and individuals create and enact globally applicable models of behavior which are later translated into policy and institutions norms throughout the world.

◆Poster 6◆

Statistical Shape Analysis of Animal Teeth

Presented by Grady Flanary, Kajal Chokshi

Supported by Dr. Gregory J. Matthews, Mathematics and Statistics

Students used statistical computational software to analyze and predict different species and tribes of animal teeth. The focus was on predicting the species or tribe of a tooth if only half the tooth was able to be observed (i.e. the tooth had been sheared in half). Analysis was done using the programming language R.

◆Poster 7◆

Exploring a Novel Antimicrobial Peptide in the Fungal Pathogenesis of ileal Crohn's Disease

Presented by David Velasquez Jr.

Supported by Dr. Pierre J.F., Dr. La Torre D., Dr. Kambal A., Dr. Sidebottom A., Dr. Chang E.B.

Novel peptide (NP), a gut hormone recognized for its role in satiety, is abundantly expressed and packaged in granules of Paneth cells (PC). Its stimulated release by TLR ligands suggested a previously unrecognized role as an antimicrobial peptide (AMP). We hypothesize that NP is involved in maintaining fungal commensalism in the healthy gut. PC dysfunction has been reported in patients with ileal Crohn's disease (iCD) (11). PC dysfunction may explain increases in fungal load often associated with risk and severity of iCD. Thus, we aim to further understand iCD and identify patients that may benefit from measures to restore fungal commensalism.

◆Poster 8◆

Harvey World: Black Placemaking within Black Suburban Communities

Presented by Sacora Williams; Community Research Fellowship, Provost Fellowship

Supported by Dr. Peter Rosenblatt, Sociology; Cameron Williams, Sociology; Gloria J. Taylor Foundation; Restoration Ministries

This research will focus on the predominantly Black suburb of Harvey, IL. Once known as "the Magic City," Harvey is one of many suburbs that has declined due to the suburbanization of poverty. This form of poverty can be understood as the movement of low-income individuals into declining suburbs. Using this framework, I will be countering the deficit approach to understanding low-income, Black communities. This study will focus on Black Placemaking within the city of Harvey and efforts to sustain the community, with little resources from local and state government. This ethnographic study will look at two organizations that combat these injustices.

◆Poster 9◆

The Role of Raw in the Development of Glia in the Nervous System of Drosophila melanogaster

Presented by Luselena Perez; Provost Fellowship

Supported by Dr. Jennifer Mierisch, Biology

Glial cells are an important cell type of the brain. The similarities in glial biology between Drosophila melanogaster and mammals is remarkable. We wanted to observe the role of raw in glia during development, specifically in the nervous system. Using the Gal4/UAS system, it is possible to knockdown raw expression specifically in glia. We observed a reduced number of glial cells in the two innermost nerves A8/9. Possible reasoning for why a reduction in the number of glia was hypothesized to cell death, reduced proliferation, and/or interactions in JNK signaling. Experiments were conducted to address these theories.

◆Poster 10◆

Typha x glauca and Waterfowl Food Availability in the Great Lakes Coastal Wetlands

Presented by Rene Belleville; Mulcahy Scholars Program

Supported by Drew Monks, Shane Lishawa, Brian Ohsowski, Nancy Tuchman

Great Lakes coastal wetlands are crucial for waterfowl due to their abundance of moist-soil plants that produce seeds which serve as their primary food source. However, many coastal wetland plant communities have been altered by Typha x glauca, a

species of highly invasive hybrid cattail which suppress native vegetation. A study was designed and conducted in Shiawassee National Wildlife Refuge to examine effects of Typha and management regimes on the production of moist-soil seeds. Ultimately, this research will inform land managers and scientists of the connections among Typha, seed production, and waterfowl food resources within the context of wetland restoration.

◆Poster 11◆

Contrasting and Correlating Susceptible Genetic Loci to Prostate Cancer in Multiple Populations

Presented by Mohammed Abdul Sami; Mulcahy Scholars Program
Supported by Dr. Heather E. Wheeler, Biology and Computer Science

There have been several GWAS studies on prostate cancer to locate common risk alleles, but they have been mostly limited to European populations. We aim to analyze information about prostate cancer from multiple populations, including those of Japanese and African ancestry, to understand population differences in disease risk and widen the database for risk alleles. We will conduct genome-wide association studies (GWAS) and utilize PrediXcan, a computational program that can create statistical models predicting gene expression, to observe correlations between gene expression levels and prostate cancer.

◆Poster 12◆

Media Portrayals, Self-Esteem, and Ethnic Identity for Low-Income, High-Risk Minority Youth

Presented by Jamie McDowell; Provost Fellowship
Supported by Dr. Maryse Richards, Psychology; Cara DiClemente, Psychology

The goal of this research is to examine how the internalization of perceived media portrayals of Black individuals affects the self-esteem and ethnic identity of Black youth from high-risk neighborhoods. Low self-esteem can predict poor economic opportunity, crime, and disadvantaged health (Steiger, Allemand, Robins, Fend & King, 2014). The persistently unfavorable representation of Black individuals in America by the media, is well studied; however, how this effects youth identity and wellness remains relatively unstudied (Adams-Bass, Stevenson & Slaughter Kotzin, 2014).

◆Poster 13◆

Over Ten-year Insulin Independence Following Single Allogeneic Islet Transplant

Presented by Nick Jacus
Supported by Jack Williams, University of Southern California; Kevin Kavalackal, University of Illinois Chicago; Kirstie Danielson, Epidemiology & Biostatistics, School of Public Health, University of Illinois at Chicago; Rebecca Monson, Division of Epidem

Islet cell transplantation is a promising functional cure for type 1 diabetes; however, maintaining long-term islet graft function and insulin independence is difficult to achieve. In this short report we present a patient with situs inversus, who at the time of islet transplantation had a 26-year history of type 1 diabetes, complicated by hypoglycemic unawareness and severe hypoglycemic events. After a single allogeneic islet transplant of a low islet mass, and despite developing de novo anti-insulin and anti-GAD65 autoantibodies, the patient has remarkably maintained insulin independence with tight glycemic control and normal metabolic profiles for 10 years.

◆Poster 14◆

Musical Engagement and Auditory Selective Attention

Presented by Melanie Izquierdo Izquierdo, Sarah Darnell
Supported by Dr. Raymond Dye Jr., Biology

The literature suggests that early musical training enhances the ability of listeners to process arbitrary sounds, musical sounds, and speech sounds. To test this theory we assessed the ability of subjects - who came from a wide variety of musical backgrounds - to process sounds analytically vs. synthetically by asking them to make judgments about the relative levels of a target tone with two other tones were also present. Performance was measured in a 3-interval task, with the first interval serving to indicate the frequency of the target. The next two intervals presented three-tone complexes, consisting of the target and two other components (distractors).

◆Poster 15◆

Robustness of Colorectal Cancer Studies and Detection of Colorectal Cancer Signals

Presented by Sidra Sohail, Hannah Bergom; Mulcahy Scholars Program
Supported by Michael Burns, Biology

This project is a meta-analysis of the raw sequencing data from multiple studies that assessed the role of the microbiome in human colorectal cancer (CRC). This project has two main objectives. First, it will look at how robust or reliable these CRC studies are and what it indicates about the reported data and results. Second, this project will look across multiple CRC studies of tissue-associated microbial communities for cancer-specific signals, common to all CRC-associated microbial communities. The findings from these aims will be beneficial to the research community as there remain challenges when comparing results across studies of the cancer-associated microbiome.

◆Poster 16◆

What's in your Toothpaste? The Role of Arginine on the Metabolism of Galactose by co-cultures of Streptococcus mutans and Streptococcus gordonii

Presented by Zachary Pang, Richard Padovano, Jay Patel, Neil Makwana, Jasson Barrios, Alexandria VanDellen; Mulcahy Scholars Program

Supported by Domenic Castignetti, Biology; Conrad Naleway, PhD, Department of Biochemistry

Streptococcus mutans, a common bacterium in saliva is a leading cause of dental cavities. S. mutans metabolizes sugars and produces lactic acid, which causes cavities by acidic demineralization of tooth enamel. Epidemiological studies indicate that the amino acid arginine in toothpaste decreases the rate of cavities. However, few studies have investigated the effects of arginine upon human oral bacterium. This research focuses on the effects of arginine on S. mutans when co-cultured with Streptococcus gordonii. S. gordonii is able to degrade arginine and generate the base, ammonia, which could neutralize the acid produced by S. mutans.

◆Poster 17◆

Analysis of Chemical Compounds Present in Various Species of Fungi

Presented by Killian McDonald, Katie Kopp

Supported by James DeFrancesco, Forensic Science; Alfred Diggs, Biology

Identify various samples of locally-sourced fungi and develop analytical methods to extract and identify chemical constituents via Gas Chromatography (GC), Mass Spectrometry (MS), Thin Layer Chromatography (TLC), Fourier Transform-Infrared Spectrophotometry (FT-IR), and solvent extractions. The work will be guided by existing accounts of research and reference data. Methods for sample preparation will be developed to facilitate compound identifications by the various analytical techniques. This project is a collaboration with Dr. Alfred Diggs from the Department of Biology. Ultimately, the work will be used to develop a new course to be offered in the Forensic Science curriculum focused on Medicinal Plants.

◆Poster 18◆

Ayn Rand and the Pantheon

Presented by William Phelan

Supported by Lauren O'Connell, Theology

Ayn Rand's bestselling novel Atlas Shrugged has many parallels with the Greek Pantheon. Many authors have likened the theories about economics to religious myths. The parallels between religion and economics are demonstrable.

◆Poster 19◆

Regulation of the RALDH2 gene in Zebrafish

Presented by Linda Kim; Biology Summer Research Fellowship, Provost Fellowship

Supported by F. Bryan Pickett, Paula Martin, Harsh Patel, Jackie Banks, Maddie Fitzhugh, Megan Delaney, Tahir Razzaq, Colin Carroll

We have been characterizing the gene regulatory switch DNA of the gene retinaldehyde dehydrogenase 2 (raldh2) of zebrafish. Stable transgenics have been made to test different regions of regulatory DNA, attached to the normal gene activity start site. These regions have in turn been attached to DNA encoding the jellyfish Yellow Fluorescent Protein, thus a cell able to activate raldh2 will glow yellow. Using Loyola's Confocal Imaging Facility we have shown that our regulatory regions drive expression in early embryonic tissues, which may provide insight into cells susceptible to fetal alcohol exposure.

◆Poster 20◆

Predictors for Recurrence after Laparoscopic Paraesophageal Hernia Repair

Presented by Pierce Paterakos

Supported by Dr. Hariklia Dimitropoulos, Biology; Dr. F. Bryan Pickett, Biology; Dr. Michael Ujiki, FACS, NorthShore Univeristy HealthSystem; Stephanie Novak, NorthShore Univeristy HealthSystem

The purpose of this project was to determine predictors for the recurrence of paraesophageal hernias following laparoscopic hernia repair. This study's patient population was taken from NorthShore University HealthSystem's database, and statistical tests were performed to determine any significant correlative factors connected to the recurrence of paraesophageal hernias. Factors ranging from the sex of the patient, hernia type, biosynthetic mesh use, proton pump inhibitor use, and common symptoms of paraesophageal hernias were tested to determine the possible predictors of recurrence and the symptoms present following recurrence.

◆Poster 21◆

Probiotic Viability During Prolonged and Extreme pH Exposure

Presented by Mary Batrich; Provost Fellowship
Supported by Dr. Catherine Putonti, Bioinformatics and Microbiology

Digestive probiotics, specifically *Lactobacillus acidophilus*, *Bifidobacterium*, and *L. bulgaricus*, are known for maintaining the healthy nature of the gut microflora. However, their pH tolerance varies. Can ingested probiotic species survive the journey of the gut? We first isolated different *Lactobacilli* from probiotic yogurts and supplements purchased from local grocery stores. We identified the species via 16S rRNA gene sequencing and have maintained cultures at a neutral pH within the lab. Cultures were then exposed to a more gradual pH change through serial propagation. pH tolerance is essential when considering the viability and thus potential benefit of probiotics.

◆Poster 22◆

Good and Evil Teamwork

Presented by Mihaela Cristescu
Supported by Dr. Lauren O'connell, Theology

My specific research will include primary and secondary worlds involving witches, the power struggle between good and evil, and the outcomes of either one, or of the collaboration between both for one solid result.

◆Poster 23◆

The Evolution of the American Military Prior to and During the First World War

Presented by Evan Cavalier; Provost Fellowship
Supported by Dr. Patricia Mooney-Melvin, History

This project explores how the American Military evolved and changed prior to and during the first World War. This includes as early as the Spanish American War through 1918 and the conclusion of the First World War. The project emphasizes and explores the transformation of the American Military from a relatively small fighting force, to one of the largest armies of the time.

◆Poster 24◆

Bacteriophage Infection of Clinical E. coli Isolates from the Female Bladder

Presented by Rita Mormando; Mulcahy Scholars Program, Provost Fellowship
Supported by Dr. Catherine Putonti, Bioinformatics

This study, focused on the female urinary system and the prevalence of UTIs in the bladder. We tested the lytic activity of six bacteriophages against 68 strains of *E. coli* isolated from the bladders of women with and without UTI symptoms. The phages tested include Bassie and Grindy, two environmental phages isolated by our group, and N4, K30, T3 and T7. We found a number of varying degrees of infection from these phages, which we then analyzed. This work is a critical first step in identifying candidates for phage therapy of *E. coli*-caused UTIs.

◆Poster 25◆

Nasogastric Tube Insertion Anatomical Model

Presented by Jackson Bradshaw, Joey Wong-Vermillion, Mustafa Aliji
Supported by Dr. Chen, Engineering Science; Dr. Baura, Engineering Science; Dr. Kostovich, Nursing

We designed an anatomical model that displays the average dimensions of a human esophagus and nasal cavity to be used for nasogastric tube insertion practice. The model was designed to assist the Loyola nursing students in learning how to execute the procedure.

◆Poster 26◆

Cudahy Library First Floor User Space

Presented by Obaid Bin-Mahfoudh, Brooke Lepore, Christopher Castillo

Supported by Aversa Elise, Library Department; Dr. Baura, Engineering Sciences; Dr. Johnston, Engineering Sciences

The Cudahy Library suffers from a lack of positive student experience, despite being a quiet and comfortable user space for all Loyola students. The arrangement and aesthetic of the first floor Cudahy Library is not as appealing and functional as other user spaces places around campus, such as the IC. A lot of the space is not being used as efficiently as it could be, despite having all the necessary resources to do so.

◆Poster 27◆

Evaluating Students' Academic Development Through Science Writing Heuristics (SWH)

Presented by Sharlie Chansiri, Ivana Marogi; Mulcahy Scholars Program

Supported by Dr. Patrick L. Daubenmire, Chemistry & Biochemistry

Science Writing Heuristic is a method professors use to ensure students can design their own experiments to develop their own critical understandings and "...promote classroom discussion where student's personal explanations and observations are tested against the perception and contributions of the broader group." (Greenbowe). Our research is based on Guided Inquiry, which is a method that promotes students to engage in their activities. By using both Guided Inquiry and SWHs, students are then encouraged to discuss, debate, and negotiate understandings through Pre/Post laboratory questions and a Reading and Reflection response.

◆Poster 28◆

Biochemical Quantification of Pyruvic Oxime Dioxygenase from C. Pauculus

Presented by Dillon Kurila; Provost Fellowship

Supported by Domenic Castignetti, Biology

Cupriavidus pauculus is a heterotrophic nitrifier originally isolated from soil. Its Pyruvic Oxime Dioxygenase (POD) is an enzyme that catalyzes the reaction we are interested in. This enzyme is significant in its ability to remove nitrogen from the environment, possibly allowing it to function as a bioremediation agent. This research has focused on classifying the biochemical properties of the enzyme.

◆Poster 29◆

Methods of Company Valuation

Presented by Ryan Schiller

Supported by Amy Kyhos, Quinlan Honors Program

The research will explore the processes that are used to value companies in today's mergers and acquisitions environment. After explaining each method, the research will address some advantages and disadvantages regarding the respective methods.

◆Poster 30◆

Bacteriophage Interactions with Pseudomonas aeruginosa Biofilm Formations

Presented by Genevieve Johnson; Mulcahy Scholars Program

Supported by Dr. Catherine Putonti, Bioinformatics

Biofilm formations of Pseudomonas aeruginosa can be extremely hazardous to human health. Biofilms are the aggregation of bacterial cells in complex structures that current antibiotic treatments are typically unable to diminish. Bacteriophages (viruses that infect bacteria) can be used to treat and decimate biofilm complexes. This project focuses on the laboratory growth and characterization of P. aeruginosa biofilm formations, as well as on the induction of bacteriophages from the biofilms' lysates. This project also turns to the treatment of biofilms with bacteriophages and subsequent characterization of both the treated biofilms and the bacteriophages.

◆Poster 31◆

"Home is Where the Heart Is . . . If You Can Afford It," An Analysis of Low Income Housing Tax Credit Allocation and Development Costs in Cook County

Presented by Michael Flinchbaugh, Cameron Gerhart, Nick Kranjec

Supported by Anne Reilly

As rents continue to rise in urban areas and median incomes remain stagnant, housing is becoming more and more unaffordable given rising development costs. Further exacerbating this issues is a low supply of affordable units, and ever growing urban populations. This type of disparity has caused a lack of affordable housing for the general public, thus, prompting local, state, and federal governments to work with developers nationwide in order to accommodate citizens of all income levels. The most widely used tool that the federal government has in aiding in the creation of affordable housing is the Low Income Housing Tax Credit (LIHTC).

◆Poster 32◆

Fresh Basil

Presented by Jordan Stack, John Reiss

Supported by Kevin Erickson, Urban Agriculture, Dr. Baura., Engineering; Maria Noriega, Felice's

We successfully discovered a method that keeps basil fresh for a minimum of seven days. Learn about our experiments and how we determined which environmental factors had the greatest impact on our outcome. Also, see how we evaluated our data and designed our method for keeping basil fresh.

◆Poster 33◆

Justice Based Leadership

Presented by Sangeen Durrani, Christin Washington

Supported by Lisa Combs

The presentation will take a look at how implementing a method of justice based leadership in a mentor relationship will effect the community of the mentees.

◆Poster 34◆

Addressing the Assets and Concerns of Rogers Park Through Family Matters

Presented by Ethan Chiu, Lauren Mendoza, Alisha Sayani

Supported by Lisa Combs, Student Diversity & Multicultural Affairs

Community Asset Mapping is a technique used to identify assets such as strengths, weaknesses, resources, and concerns of a community. This technique can be used for a variety of reasons, specifically how one can serve the community to enhance the quality of life of those in the community. Once the assets are identified, a visual map is created to show the community where they are located and how they can access them. Family Matters recognizes the needs of the students and caters their curriculum to facilitate growth.

◆Poster 35◆

Religion in the story of Narnia

Presented by Elena Tinto

How Christianity is a big part of the story of Narnia and why.

◆Poster 36◆

Investigating the Molecular Mechanism of How Novel Photodynamic Therapy (PDT) Agents Kill Cancer Cells

Presented by Julia Stys; Mulcahy Scholars Program

Supported by Dr. Stefan Kanzok, Biology

Photodynamic therapy (PDT) has shown to be an auspicious procedure, essentially helping in treating several types of cancer. PDT can be targeted explicitly at cancer cells, causing them to go into cell death through either necrosis or apoptosis. This type of treatment is composed of two parts, a nontoxic agent, and a light. A singlet oxygen is generated when the photosensitizer is exposed to a certain wavelength of light. The result of this is the production of a cytotoxic reactive oxygen species (ROS). The cancerous cells are then killed by the ROS through its activation of specific cell death.

◆Poster 37◆

Pill Sorter

Presented by Shahreen Chowdhury, Raquel Miera, Rachel Roberts

Supported by Dr. Gail Baura, Engineering Science; Dr. Sarah Ali, Engineering Science; Mark Hoffman, TCGRx; Ron Weaver,

TCGRx; Michael Jehn, TCGRx

Our sponsor, TCGRx, is a pharmaceutical workflow company that currently uses candy, Over the Counter (OTC) medications, and supplements to test the functionality of their robotic equipment and instrumentation. The purpose of our project is to develop a pill sorter to reduce the manual labor and time involved in hand sorting pills after they have undergone testing in TCGRx's equipment. Our device analyzes size, shape, and color of each pill using image processing techniques to identify and sort each pill by type.

♦Poster 38♦

Religious Allegory in The Wizard of Oz

Presented by Victoria Stang

I will be discussing metaphysical theology and religious allegory displayed in The Wizard of Oz

♦Poster 39♦

Ternary Phase Diagrams Applied to Influenza A Proteins: Component Distributions and Distance Metrics

Presented by Yunjoo Bae

Supported by Daniel Graham, Dr., Chemistry

The proteins of influenza viruses work cooperatively to perform distinct functions: host infection, reproduction, and dispersal. The proteins are subject to yearly mutations through genetic drift and shift. Mutations keep the host immune systems off-balance and make the development of vaccines near impossible. Our research focuses on the primary structures of influenza A proteins. The cooperative traits are explored with the help of thermodynamic tools. Specifically, the protein variables of state are coarse-grained so as to place points on ternary phase diagrams. Variables which place points close to one another shine light on the cooperative facets.

♦Poster 40♦

Social Justice Internship - Catholic Charities Volunteer Relations

Presented by Clarissa Schooley

Supported by Andrew Miller, Center for Experiential Learning

This presentation will show what I have worked on and learned through my internship at Catholic Charities in the Volunteer Relations department. Some of my activities included assisting with Celebration of Giving, Casino Night, and clerical work.

♦Poster 41♦

Elucidating the Function of a Evolutionarily Conserved Embryonic Splice Variant of Type II Collagen During Vertebrate Development

Presented by Sophia Lam, Dhruvi Bangaley, Samantha Swank; Biology Research Fellows Program, Mulcahy Scholars Program

Supported by Dr. Rodney Dale, Biology; Charles L. Ingersoll, Biology

The vertebrate Type II Collagen alpha-1 gene (*Col2 α 1*) gene has an important role in the regulation of craniofacial development. The project focuses on the gene regulation and expression of the zebrafish gene *Col2 α 1a* – an ortholog of the human *COL2 α 1* gene that has a major role in cartilage development and bone growth. The goal is to observe the early development of zebrafish during the overexpression and knockdown of *col2 α 1a* in their genome. Observing the effects of *Col2 α 1a* overexpression and knockdown on VWF-C and BMP will help our lab understand the expression and regulation of *Col2 α 1* in vertebrate development.

♦Poster 42♦

Peter Pan's Shadow

Presented by Nicole Hanks

Supported by Dr. O'Connell, Theology

This presentation explores the connection between Peter Pan's shadow and his characteristically mischievous behavior. The topics touched on include the aspects of light and dark, morality, as well as immortality in reference to religious text but displayed in the classic Walt Disney film.

◆Poster 43◆

Investigating the Potential Aldolase Activity of Pyruvic Oxime Dioxygenase

Presented by Lauren Griffin; Provost Fellowship
Supported by Domenic Castignetti, Biology

Aldolases are enzymes that reversibly cleave sugar molecules. Specifically, aldolase is found in the fourth step of glycolysis that catalyzes the cleavage of the C3-C4 bond in fructose-1,6-bisphosphate to dihydroxyacetone phosphate and glyceraldehyde-3-phosphate. *Cupriavidus pauculus* is a heterotrophic nitrifier-denitrifier bacterium containing the enzyme pyruvic oxime dioxygenase. This enzyme is known to have dioxygenase activity. However, the protein's amino acid sequence is homologous with a class II aldolase with Zn (II) dependence. Therefore, the potential for pyruvic oxime dioxygenase to serve as both a dioxygenase and an aldolase is under investigation. The isolation, purification, and characterization of the enzyme are discussed.

◆Poster 44◆

Synthesis of Ruthenium Complexes as Potential Anti-Cancer Agents

Presented by Talal Al-Assil; Mulcahy Scholars Program, Provost Fellowship
Supported by Dr. Wei-Tsung Lee, Chemistry and Biochemistry

As cancer continues to be a dangerous and incurable disease that attacks over half of the population, it is becoming increasingly vital to find ways to improve the quality of life for patients fighting this disease. While chemotherapy is the most common treatment for cancer fighters, most current drugs, whether in clinical trials or those approved by the FDA, lack specificity on cancerous cells, causing tremendously severe side effects. Due to these disadvantages of currently used or studied drugs, our inorganic-chemistry-based design intends to demonstrate an improved biological reactivity with fewer side effects in comparison to other chemotherapeutic agents.

◆Poster 45◆

Perceived Stress and Relationship Skills in Undergraduate Students: The Moderating Role of Decision-Making and Problem-Solving Skills

Presented by Sylwia Osos; Provost Fellowship
Supported by Carol Hundert, Clinical Psychology; Dr. Colleen Conley, Clinical Psychology

College students face a great deal of stress, which can influence their social competencies. Possessing other valuable social-emotional skills may lessen the impact that stress can have on relationships. This research demonstrates a negative association between perceived stress and relationship skills, which was moderated by decision-making and problem-solving skills. Specifically, the impact of perceived stress on relationship skills was buffered by stronger decision-making and problem-solving skills. Mental health promotion programs targeting stress can focus on improving students' decision-making and problem-solving skills to protect against the negative effects of stress on relationship skills.

◆Poster 46◆

Microplastic Consumption and Excretion by Fathead minnows (*Pimephales promelas*): Is Particle Size Dependent?

Presented by Mariana Felix-Kim; Provost Fellowship
Supported by Tham Hoang, Institute of Environmental Sustainability

Microplastics are defined as plastic particles and fibers less than 5mm in size and are capable of persisting in the environment for long periods of time. Due to the increasing abundance of plastic debris in aquatic ecosystem, researchers have begun to study the ingestion of microplastics. The purpose of this study is to characterize the dependence of microplastic consumption and excretion on particle size by fathead minnow (*Pimephales promelas*) over time.

◆Poster 47◆

Engineering Science Capstone Design Project: Brookfield Zoo

Presented by Jason Hoffman, Andrew Buchholz, Katie Woodull-Fuget
Supported by Gajan Sivandran, Engineering Science; John Kanzia; Dave Derk; Sandra Ortiz-Ortega; Doug Szarzynski; Larry Moser; Dr. Tom Meehan

Partnering with Brookfield Zoo, the Environmental engineering seniors utilized a systems engineering approach to determine effective and cost-efficient design modifications of the current Life Support System at Brookfield Zoo. The system treats 15 million gallons of water from dolphin and pinniped pools daily. Wastewater unit processes research and water quality characterization were conducted to determine the efficacy of design options. Two primary system adjustments were identified; (1) introducing coagulation and flocculation in line with a clarifier; (2) altering the operation of sand filters to promote biological treatment. The final deliverable will satisfy regulatory constraints and meet all applicable engineering standards.

◆Poster 48◆

Functional Differences in a Cognitive Control Network in Older Adults with Exceptional Memory

Presented by Emma Sims; Mulcahy Scholars Program

Supported by Robert Morrison, Psychology; Ian Kahrilas, Psychology

The ability to learn new information is critical in aging, but less is known about contributing factors for its variability. Research with older adults with exceptional memory (SuperAgers) suggests that anterior cingulate cortex (ACC) differences may be important. We applied a discrete regional source model to EEG data to characterize rostral ACC and pre-SMA activity. Five regional sources were analyzed based on a meta-analysis of visual go-nogo tasks and a prior fMRI study with SuperAgers. EEG data were recorded during visual go-nogo tasks from 43 individuals (65+ years). Results suggest ACC functional differences contribute to preserving memory function in aging.

◆Poster 49◆

"You Were The Chosen One": Star Wars and Christian Redemption

Presented by Maxwell Dziabis

Supported by Dr. Lauren O'Connell, Theology

George Lucas claims that the prophesized "Chosen One" of his Star Wars saga is Anakin Skywalker, a.k.a. Darth Vader, as he ultimately destroys the Sith and "brings balance to the Force." This presentation will explore how Lucas and his storytelling successors took inspiration from Christian interpretations of providence, messiahship, and redemption in detailing the nature of the Force and why a Chosen One was sought after at all. It will examine both past and present versions of the saga's story as it has developed over the span of nearly fifty years, as well as across "Legends" and "canon" storytelling.

◆Poster 50◆

The Influence of Media Violence Exposure on the Neural Correlates of Explicit Emotional Face Processing and Subsequent Response Inhibition

Presented by Zoa Glab; Carbon Undergraduate Research Fellowship

Supported by Dr. Robert Morrison, Psychology; Dr. Joseph Vukov, Philosophy; Dr. Laura Stockdale, Brigham Young University

Research using implicit emotion paradigms has shown that exposure to violent media is related to increased aggressive behavior, and that desensitization to emotions of others may be an underlying mechanism. When participants explicitly identify angry faces, exposure to media violence yields increased speed and accuracy. These results suggest that media violence may impact implicit and explicit emotion processing differently. In the present study EEG data were collected while participants categorized facial expressions as either happy or afraid during a stop-signal task (SST). Prior to the SST, participants watched a violent or a non-violent film.

◆Poster 51◆

Fissured Families

Presented by Carolina Paniagua; Social Justice Fellowship

Supported by Ruth Gomberg-Muñoz, Anthropology

Mixed status families face specific challenges to family reunification after a child is placed in the child welfare system. This project presents results that explore the barriers undocumented parents face in the legal system, and examine how US family law and practice apply to mixed status families, and undocumented parents, in cases of child removal and family reunification. The project discusses the criteria and obstacles that immigrant parents encounter in custody cases with Chicago DCFS, the role of immigration status in reunification, the racialization of legal status, and the efforts of legal and child services' systems on behalf of undocumented parents.

◆Poster 52◆

Researching the Accessibility of Quinlan's Undergraduate Advising Office for Students

Presented by Peta Silva, Riley Counihan, Noah Smith, Alana Durham, Augustine Garcia, Xinyi Amber Wang

Supported by Stacey Neier-Beran Marketing; Kate Baumann, Engine US; Britany Trujillo, Eshots Inc.

UGA has requested market research help in exploring student satisfaction and perception of their services. We believe that by increasing UGA's accessibility, student perceptions and satisfaction will increase as a result of this improvement. Currently, UGA's two main consumers are polar opposites. They have diligent students that are seeking reassurance, and students that

have not been attentive to their academic needs and are in seek of major assistance. UGA is looking for solutions to attract the middle group of students that are unreached; those who are unaware of the assistance and benefits that UGA can provide.

◆Poster 53◆

Marketing Research Process

Presented by Zachary Derosier, Bryan Schwaba, Rositsa Stoyanova, Zach Ono, Daniel Vallarino, Danel Gonzalez
Supported by Stacy Neier Beran; Top Box Foods; Undergraduate Advising

We will be explaining our research process for meeting our clients' marketing needs throughout our semester of working with them. We will talk about what we learned and our reflection on the research process as a whole.

◆Poster 54◆

Optimal Conditions for Biomass Accumulation of *Chlorella vulgaris* and Nutrient Efficient Harvesting Techniques

Presented by James Donelan; Mulcahy Scholars Program
Supported by Zach Waickman, Institute for Environmental Sustainability

The Searle Biodiesel Lab has an ongoing effort to reach 100% sustainability. This includes finding a use for the waste products of the biodiesel creation process. One such product is water that is filled with nutrients which must be removed before being reused in the creation process. These nutrients can be removed by adding the green microalgae *Chlorella vulgaris*. However, a harvesting technique to remove *C. vulgaris* from this water has yet to be established. This study focuses on finding the most efficient algal harvesting technique out of these three methods: pH-induced flocculation, acidic flocculation, and centrifugal force.

◆Poster 55◆

Creative Legal and Organizing Strategies in the Immigrant Rights Advocacy Network

Presented by Marisa LaBella; Social Justice Fellowship
Supported by Dr. Ruth Gomberg-Muñoz, Anthropology

Community organizers and legal experts within the immigrant rights advocacy network have mobilized with a newfound resilience in response to ongoing administrative attacks against immigrant communities. Immigration policy changes enacted by the Trump Administration render formerly protected communities deportable, with profound impacts on families and communities at the local level. In this ethnography, I explore how local-level community organizations and legal experts at the interior (Chicago), borderlands (El Paso and Juárez), and exterior (Mexico City) of the United States develop creative legal strategies to challenge settled and unsettled areas of law. In doing so, local-level community organizers and legal service providers participate in imagining alternatives to the contemporary sociopolitical structures that marginalize underserved populations.

◆Poster 56◆

Structure Determination and Enzyme Kinetics of NAD(P)H-flavin oxidoreductase (NfoR)

Presented by Audrey O'Neill; Carbon Undergraduate Research Fellowship
Supported by Dr. Dali Liu, Dr. Graham Moran, Yuanzhang Zheng, Joseph Roman, Dr. Brett Beaupre

Hexavalent chromium pollution poses major health concerns. Many compounds of Cr(VI) such as chromate are carcinogenic, with long-term exposure leading to lung and digestive tract cancer as well as liver failure and mutagenic damages. A noninvasive way to combat Cr(VI) pollution is through bioremediation. Chromium-resistant bacteria have been found to have oxidoreductase enzymes such as NfoR to facilitate the reduction of harmful Cr(VI) to Cr(III). NfoR activity is significantly enhanced in the presence of Cu(II). Using X-ray crystallography, steady-state kinetics, and pre-steady-state kinetics, we characterized NADH and FMN binding sites, kinetic properties, and possible intermediates in the reduction mechanism.

◆Poster 57◆

Determining the Molecular Mechanism of Tonotopic Map Formation in the Mouse Cochlear Nucleus

Presented by Amali Fernando; Mulcahy Scholars Program
Supported by Dr. Yu, Biology

Sound information is transmitted to the cochlear nucleus via spiral ganglion neurons. Spiral ganglion neurons innervate cochlear nucleus neurons in a tonotopic fashion, meaning the neurons are organized by frequency response. Very little is known about the molecular mechanism underlying tonotopic map formation. The purpose of this project is to determine what molecules reg-

ulate the auditory neurons in the formation of the tonotopic map. The family of signaling proteins called Ephs and ephrins are known to be involved in the developments of topographic gradients within other sensory systems, such as the visual system.

◆Poster 58◆

Anthropogenic Litter on Chicago Beaches

Presented by Raul Lazcano Gonzalez; Provost Fellowship
Supported by Timothy Hoellein, Biology

Anthropogenic litter (i.e., trash; AL) accumulates on beaches worldwide. On Chicago beaches accumulation of AL has been observed, but no research has compared AL to organic matter distribution. We measured AL and organic matter on four beaches in Chicago, IL. We expect AL accumulates with organic matter at the strand line. As expected, pier locations served as sites of greater organic and anthropogenic litter accumulation. The data obtained may serve useful in designing beach clean-up protocols and preventing AL pollution.

◆Poster 59◆

Word Learning through Movement

Presented by Madeline Jurcev; Provost Fellowship
Supported by Dr. Elizabeth Wakefield, Developmental Psychology

We know that children learn verbs more flexibly through gesture – hand movements that communicate information – versus action – hand movements that directly manipulate objects (Wakefield, et al. 2018). Here, I investigate whether adults show behavioral evidence of learning verbs differently through action or gesture experience. I consider whether visual attention patterns differ while learning and assess learning through a reaction time measure. I hypothesize that gesture leads to more flexible learning by directing visual attention to the hand shape and movement associated with each verb.

◆Poster 60◆

Determining Risk Alleles for Prostate Cancer in Latino and Japanese Populations

Presented by Jack Morris; Mulcahy Scholars Program, Provost Fellowship
Supported by Dr Heather Wheeler, Bioinformatics

Genome wide association studies (GWAS) have revealed countless variants that lead to disease susceptibility. The bulk of these studies have been focused on individuals of European decent. My project focuses on using the power of GWAS and a molecular prediction model called PrediXcan to determine the correlation between genotype and phenotype in Latino and Japanese individuals being susceptible to Prostate Cancer.

◆Poster 61◆

Evaluation and Utilization of DNA Barcodes to Enhance the Efficacy of Clover Species Identification

Presented by Michelangelo Gualandri, Courtney Van Laten, Mariana Olivencia, Mohammed Abourahma, Malik Abdeljaber, Mohammad Salah
Supported by Dr. Laten, Biology

Although researchers try to be as accurate as possible when sequencing DNA for species identification, some ambiguities are inevitable. We discovered several accessions with two or more polymorphisms. That have not been reported before. Indicating an incomplete concerted evolution.

◆Poster 62◆

The Role of Raw in the Development of Glia

Presented by Taylor Wendt; Provost Fellowship
Supported by Dr. Jennifer Mierisch, Biology

Development and function of the nervous system depends on multiple cell types, one being glia. Glia in the eye develop as three subtypes: perineurial, subperineurial, and wrapping glia. We have identified raw as a critical regulator of glial development and JNK signaling. However, the specific glial subtypes that require Raw function remain unknown. We use a marker for perineurial glia to determine if they are transdifferentiating into wrapping glia early, later, or not at all. We are also testing if trc, a kinase that has shown interactions with raw, also has a role in glial development and JNK signaling regulation.

◆Poster 63◆

Effects of Physician Experience on Costs and Outcomes on an Academic General Medicine Service

Presented by Suma Gondi, Samantha Mandelke

Supported by Dr. Dione Helfgott, Biology; Tharani Jeyaram, University of Chicago Medicine

The United States has the most expensive health care system in the world yet falls behind in health outcomes as seen in The Commonwealth Fund's 2014 Update. The US ranks last on indicators of efficiency, equity, and health outcomes. Hospitalist medicine is a field that emerged from this need to improve efficiency and primary care. In this multi-centered trial, conclusions were drawn that hospitalists decreased resource use and short-term mortality in patients.

◆Poster 64◆

Modification of Bovine Serum Albumin (BSA) with a Maleimido-functionalized, 8-arm Polyethylene Glycol Backbone (Mal-PEG8) as a Drug Delivery System

Presented by Dzenita Huskic; Mulcahy Scholars Program

Supported by Kenneth Olsen, Biochemistry; Jonathan Hill, Biochemistry

Multi-albumin-based drug delivery nanoparticles were prepared via reaction of Cys34 of bovine serum albumin (BSA) with maleimido-functionalized, eight-armed polyethylene glycol backbones (Mal-PEG8). Complexation of several BSA molecules with PEG8 would potentially allow for reduction of osmotic load, avoid immunogenic response, and decrease the risk of drug toxicity while maintaining ligand binding capabilities. Analytical ultracentrifugation of high MW species of PEGylated BSA revealed a mixture of complexes. The majority (70%) contained between two and six albumins per PEG8 backbone. These species tightly bound naproxen, a known Drug Site II ligand, with an association constant on the order of 10^7 M⁻¹.

◆Poster 65◆

The Molecular Context of Rib Function in the Developing Gonad

Presented by Danielle Talbot; Mulcahy Scholars Program

Supported by Dr. Jennifer Mierisch, Biology

During organogenesis, cell signaling plays a critical role in the regulation of cell migration, proliferation, and the establishment of cell-cell interactions. Misregulation of any of these processes can lead to organs that fail to form and/or execute their functions properly. The fruit fly gonad has proven an excellent model to study how signaling pathways that function early in organ development act to maintain adult organ homeostasis. By identifying the genes involved in organ development we are better able to treat the diseases, disorders, and lethalties that are caused when they fail to properly form

◆Poster 66◆

Some Results May Vary: The Relationship Between Human Development and Microlending

Presented by Grant Uline, Michael Migliore, Will Laveck

Microloans have been lauded as an effective way to empower those with little access to traditional financial institutions. Early studies on the effectiveness of microfinance posit it as an effective method of wealth-generation. Proponents of microfinance claim the loans support developing economies and empower entrepreneurs. However, recent studies suggest that their effectiveness may be overstated, or even harmful to borrowers. We attempt to quantify the relationship between a country's human development and its prevalence of microloans. We find a positive correlation between human development and outstanding microloans, suggesting that as microfinance investments increase, a country's level of development increases.

◆Poster 67◆

Curation and Biodiversity Analysis of Loyola's Department of Biology Aquatic Insect Collection

Presented by Madeline Zayed

Supported by Martin Berg, Biology

The Department of Biology's aquatic insect collection represents 25 years of primarily student-driven projects with the goal of documenting aquatic insect biodiversity in Illinois, northern Wisconsin, and the upper peninsula of Michigan. Despite the large number of collections, a quantitative analysis of biodiversity has not been conducted. This project performs such an analysis at the family and genus taxonomic levels and will inform future projects with the aim of filling gaps in our knowledge of aquatic insect biodiversity in the upper Midwest.

◆Poster 68◆

Examining the Impact of Income Level and Partner Status on the Mental Health of Mexican-Origin Immigrant Mothers

Presented by Farah Harb

Supported by Dr. Catherine DeCarlo Santiago, Psychology; Yvita Bustos, Psychology

As of 2015, there are 56.6 million Latino immigrants living in the United States, of which Mexican-origin women made up a growing proportion. Many of these women face traumatic and stressful experiences during their journey and upon arrival (U.S. Census Bureau, 2015; Paris, 2008). This may impact their mental health, as Latina women have been shown to have a higher risk of depression than white women (Blacher, Lopez, & Shapiro, 1997). The current study, which is drawn from a broader study, will specifically examine the impact of income level and partner status on the mental health of Mexican-origin immigrant mothers, focusing on depression, anxiety and somatization.

◆Poster 69◆

Permanently Prejudiced or Flexibly Fair? The Effect of Mindset, Attributions, and Emotions on Confronting Racism.

Presented by Samantha Gasaway; Provost Fellowship

Supported by Dr. Robyn Mallett, Psychology; Jamie Patrianakos, Psychology; Dr. Anne Sutter, Psychology

Although people think they would confront racism, actual confrontation is rare (Kawakami et al., 2009). Accordingly, we examined several influences on deeming a situation confrontation-worthy. We randomly assigned White participants to read a scenario that manipulated whether they were socially close to or distant from the perpetrator of discrimination (relationship). We measured their perception of others' ability to change over time (mindset), their tendency to assume others' behavior is caused by personality or the situation (attribution), and their emotional reactions to a racist event. We discuss which factors have the biggest impact on the decision to confront racism.

◆Poster 70◆

Microplastic Co-Occurance with Chemical Contaminants in Invasive Mussels in Lake Michigan, USA

Presented by Naiha Sharma, Deeb Omari; Mulcahy Scholars Program

Supported by Dr. Timothy Hoellein, Biology; National Oceanic and Atmospheric Association

Microplastic (particles <5 mm) are common in marine and freshwater ecosystems, but their consumption by organisms and effects of food webs are not well studied. In addition, microplastic may absorb common hydrophobic contaminants in polluted ecosystems, thereby serving as a vector for chemical transport into aquatic food webs. We measured microplastic abundance in invasive quagga mussels (*Dreissena rostriformis bugensis*) collected throughout the Milwaukee River harbor, Wisconsin. We examined microplastic according to mussel size class and location. Results will be combined with ongoing chemical analysis of mussel tissues, and inform our understanding of microplastic ecology in freshwaters.

◆Poster 71◆

The Relationship Between IT Investment and Revenue Growth in Retail and Technology Companies

Presented by Brian Kosch

Supported by Fredrick Kaefer, Quinlan School of Business

The increasing use of information technology (IT) has brought about significant changes to nearly all aspects of the business world. Firms now must consistently invest a significant portion of capital into IT to maintain a competitive advantage. New business models based on the use of IT have become very adaptive and innovative, and their value can be seen through the successive growth of companies such as Facebook, Amazon, Apple, Netflix and Alphabet's Google. This research investigates the relationship between IT investment and revenue growth over a five year period for Fortune 500 companies in the retail and technology sectors.

◆Poster 72◆

Chronic Toxicity of Copper-Cadmium and Copper-Chromium Binary Metal Mixtures on *Daphnia magna*

Presented by Kelsey O'Malley

Supported by Dr. Tham Hoang, Institute of Environmental Sustainability

Environmental regulations are enforced under the assumption that heavy metals act independent of other pollutants. This is contradictory in aquatic ecosystems that contain mixtures of pollutants leading to interactions that are additive, synergistic, or antagonistic [1]. The current study analyzes the effects of copper binary metal mixtures in *Daphnia magna*. Copper concentra-

tions of 1, 3, 7, 9, 11, and 13 μ g/L were tested alone and concurrently with mixtures with the same concentrations and 1.5 μ g/L of Cadmium or 5 μ g/L of Chromium.

◆Poster 73◆

Examining the Effects of Advice Taking on the Decision Accuracy of Individuals and Two-Person Teams

Presented by Catie Larrison; Provost Fellowship

Supported by Dr. James R. Larson, Jr, Psychology

Previous research suggests that groups who reach a consensus decision before receiving advice take that advice less than individuals do, and less than groups prevented from reaching consensus beforehand. Failing to take advice should lower the judgment accuracy of groups who reach an initial consensus relative to individuals and to groups prevented from reaching consensus. However, recent studies failed to find this difference. The present study further explores advice taking by individuals and groups by employing questions with more precise true values than used in previous research. Results will be discussed in terms of their implications, limitations, and future directions.

◆Poster 74◆

Parents' Aspirations & Students' College Preparation

Presented by Rachel Rolseth

Supported by Christine Li-Grining, Psychology; Jinyoung Koh, Psychology; Zahra Naqi, Psychology

This research will identify the aspirations that parents have for their teens' future and how these aspirations are linked to their students' college preparation. The data were obtained through surveys with low-income, ethnic minority parents and their teens who are former Head Start students. These teens are now in their 11th and 12th year of high school. Qualitative data were coded using thematic analysis, and five categories of parental aspirations were identified. Results indicated that there were significant relations between parents' aspirations and students' interest in pursuing a post-secondary education and completing steps in the college application process.

◆Poster 75◆

Battle of the Herps

Presented by Brittany Taylor, Courtney Carmack

Supported by Stephen Mitten, Institute of Environmental Science

Species richness and abundance of reptiles and amphibians we observed in the Madre de Dios region of Peru in order to advocate for conservation. The comparison of species richness and abundance of reptiles and amphibians draws attention to the large diversity of organisms that could be lost through habitat destruction. Our project also bring attention to the conservation efforts of Inkaterra Association. The importance of community engagement and public education is also emphasized through our use of iNaturalist.

◆Poster 76◆

Selective Targeting of Cells in Zebrafish Using Folate Mediated Photodynamic Therapy Agent

Presented by Alyssa Panganiban; Mulcahy Scholars Program, Provost Fellowship

Supported by Dr. Rodney Dale, Developmental Biology & Bioinformatics; Dr. Ken Olsen, Chemistry & Biochemistry; Dr. Rojena Jones

This research project involves the use of photodynamic therapy (PDT), which is a therapy that utilizes light to selectively damage a cancerous cell. Cancerous cells are characterized by uncontrolled and unregulated cell growth. This treatment is of clinical importance in developing novel oncology therapies that have reduced toxic effects to healthy cells. This project will highly contribute to the ongoing development of cancer treatments, while narrowing down the methodology for selectively and actively targeting proliferating cells and avoiding potential side effects.

◆Poster 77◆

The Influence of Statistical Presentation on Political Perceptions

Presented by Kathryn Hansen; Carroll and Adelaide Johnson Scholarship, Mulcahy Scholars Program, Provost Fellowship

Supported by Dr. David Doherty, Political Science

Through a political survey, this research studies how voters' perceptions of political facts can be influenced by presentation of relevant data. The research analyzes the differences in response to political data when altering partisan cues. It can be common for a voter to believe a claim based on party support, rather than seeking out facts to validate the claim. This research attempts

to measure what aspects of data presentation can minimize this effect of copartisanship in these scenarios. In an age of hyper-partisanship, my research attempts to explore if and how we can better present political facts to everyday Americans.

◆Poster 78◆

The Effect of Attention in Grapheme-Color Synesthesia

Presented by Almasa Duheric, Olajumoke Bamgbose, Rachel Alexander, Amanda Boyer, Ali Piracha, Michelle Wong, Victoria Roberts, Zachary Tobin

Supported by Anne Sutter, Psychology

Grapheme-color synesthetes experience colors when reading black letters/numbers on a white background. Some (“projectors”) see the color outside themselves, while others (“associators”) see it in their “mind’s eye”. We investigated potential differences between projectors and associators in the role of attention/automaticity in their synesthetic experiences. Participants were required to identify the color of dots presented at varying distances from a letter/number that synesthetically induced either the same color as the dots or a different color. Thus, the letter/number was either inside or outside the attentional window. We expect projectors to suffer more synesthetic interference than associators and controls.

◆Poster 79◆

Relationships between Neuronal Birthdates and Tonotopic Positions in the Mouse Cochlear Nucleus

Presented by Jenny Scheffel; Provost Fellowship

Supported by Dr. Wei-Ming Yu, Biology

Tonotopy is a key anatomical feature of the vertebrate auditory system, but little is known about the mechanisms underlying its development. Since date of birth of a neuron correlates with tonotopic position in the cochlea, we investigated if it also correlates with tonotopic position in the cochlear nucleus (CN). In the cochlea, spiral ganglion neurons are organized in a basal to apical progression along the length of the cochlea based on birthdates, with neurons in the base (high-frequency sounds) born early, and those in the apex (low-frequency sounds) born late. The correlation between birthdate and tonotopic position suggests testable mechanisms for specification of tonotopic position.

◆Poster 80◆

Utilization of Tumor Genome Sequencing at NorthShore University Health System

Presented by Karson Lychuk

Supported by Sereika, A, RN; Dr. Gulukota, K; PharmD. Wake, D; Dr. Khandekar, J

With the Bioinformatic technologies rapidly developing, healthcare practices often lag behind. This study was to quantify how often physicians use and follow up on tumor utilization mapping in the oncology department of NorthShore University Health System.

◆Poster 81◆

The Policy Solution to Cigarette Butt Pollution

Presented by Monica Dever, Celine Wysgalla, Kathy Zhang, Kayla Baum;

Supported by Dr. Tania Schusler, Institute of Environmental Sustainability; Dr. Justin Harbison, Health Sciences Division; Dr. Sasha Atkins, Public Health; Dr. Olga Lyandres, The Delta Institute

Cigarette butts pervasively pollute earth’s water with plastic and toxic chemicals. Few policies address the issue and those that do are ineffective as cigarette butts continue to be the most polluting item by quantity on the planet. The aim of our project is to make an extended producer responsibility (EPR) policy recommendation to stakeholders in the Chicagoland area. We studied current policies in place for the city of Chicago and state of Illinois that address the issue of cigarette butt pollution and identified opportunities for formally implementing a cigarette butt EPR policy.

◆Poster 82◆

Gonad and genital differentiation in all female gecko species, *Lepidodactylus lugubris*

Presented by Gannon Cottone, Ameer Odeh; Mulcahy Scholars Program

Supported by Dr. Thomas Sanger, Biology

Current understanding of genitalia development and differentiation has been assumed to utilize the same mechanisms that drive mammalian phallus development. *Lepidodactylus lugubris*, an all female gecko species at maturity, have been found to chal-

lence the above assumption. This project has been done in order to determine the genetic and hormonal reasoning as to why this difference occurs. Gonads and tail sections from four different stages of *L. lugubris* development (hatchling, early juvenile, late juvenile, and mature) were taken. Immunohistochemistry (IHC) and genetic analysis were used to determine at what stage *L. lugubris* development differs from *Anolis Sagrei*.

◆Poster 83◆

Drip Irrigation at Hayt Elementary School

Presented by Isabel Hoyos, Ellie Smykowski, Tarika Ranson, Kjell Eiesland, Daniel Collins
Supported by Kevin Erikson; Michelle Adelstein, Hayt Elementary School

Irrigated agriculture often uses water amounts far beyond that necessary for the growth of plants. Further, there is a great need for fresh foods in the urban environment, especially in food deserts where residents, lack healthy, accessible, and affordable food options. Drip irrigation systems are proven to use water more efficiently, and urban gardens provide healthy food alternatives for city residents. Our project is to install a drip irrigation system at Hayt Elementary School's garden and to educate the students on the importance of water conservation and the benefits of urban agriculture.

◆Poster 84◆

Why So Salty? Glycerin-Based Solutions for De-icing

Presented by Alexis Enright, Sam Guthman, Elena Hease, Arden Cleves, Eric Arroyo, Jeremy Ratinaud
Supported by Zhenwei Zhu, Institute of Environmental Sustainability; Tania Schusler, Institute of Environmental Sustainability

The use of chlorine-based deicers negatively affects freshwater aquatic systems and infrastructure. Impacts of chloride pollution include corrosion of steel and concrete and decreased reproductive success of freshwater organisms. By incorporating glycerin, sourced from Loyola University's Searle Biodiesel lab, to the deicing practices on campus, we will be able to reduce the impacts of salt on the environment. Through various experiments with glycerin, we aim to deliver a cost-effective alternative deicing method to Loyola University campuses that performs similarly to salt.

◆Poster 85◆

Synthesis of GNAT PA3944 Substrate Analogs

Presented by Madison Anonick
Supported by Dr. Daniel Becker, Chemistry; Thahani Habeeb Mohammad, Chemistry

The Gcn5-related N-acetyltransferase (GNAT) superfamily is responsible for diverse biological functions and is critically important in cellular and metabolic processes in all kingdoms of life. GNATs transfer an acetyl-group from an active donor, typically acetyl-coenzyme A (AcCoA), to a primary amine of an acceptor substrate. Members of this family are well known for their roles in aminoglycoside antibiotic resistance, histone modification, protein acetylation, xenobiotic metabolism, and other cellular processes. A small subset of bacterial GNAT enzymes have been studied and characterized both structurally and functionally but the function of the vast majority remains unknown.

◆Poster 86◆

Functionally Distinct Auditory Nerve Fibers Employ Different Strategies to Establish Tonotopic Mapping in the Cochlear Nucleus

Presented by Samiha Mohammed, Darwin Gutierrez, Chloe Borcean; Provost Fellowship
Supported by Dr. Wei-Ming Yu, Biology

To allow animals to separate a complex sound into its frequency components, auditory neurons is organized tonotopically by their responses to different sound frequencies. To understand how tonotopic mapping is established, we use the *Ngn1-CreERT2* and *Cre* reporter mice to genetic label high-frequency and low-frequency auditory fibers. We found that functionally distinct fibers use different cellular strategies to target and innervate neurons in the cochlear nucleus to form the frequency map. Our studies elucidate the cellular basis of how the auditory system organizes into a tonotopic arrangement, which may shed light on the etiology of some hearing impairments.

◆Poster 87◆

Exploring Acquisition and Retention for Top Box Foods

Presented by Lauren Glass, Skyler Bourquin, Anna Kleck
Supported by Stacy Neier Beran, Marketing; Jason Bilbrey, Top Box Foods; Rachel Martinez, Top Box Foods

We worked with Top Box Foods, a non-profit organization offering healthy and affordable food to the Chicagoland area, in understanding customer opinion and satisfaction in order to increase acquisition and retention.

◆Poster 88◆

Fighting for Immigrant Rights

Presented by Juliana Tamayo

Supported by Andrew Miller, Center for Experiential Learning

For the last couple of years, the immigrant community has struggled to make sense of the competing narratives dictating their future. The immigrant community lives in fear, waiting for the government's next move. Nonprofits like Catholic Charities, are hard at work, helping communities navigate the immigration system. My presentation highlights my work with Catholic Charities in the Immigration and Naturalization Services department. I've learned about the struggles the organization faces every day, all while being witness to the resilience and bravery of the immigrant community in Chicago.

◆Poster 89◆

Creating a Lab-Scale Electric Barrier to Combat Invasive Species in the Chicago Area Waterway System

Presented by Jonathan Cirone, Zalia Cook, Jonathon Staunton

Supported by Dr. Robert Polak; Dr. Reuben Keller; Rachel Egly, Institute of Environmental Sustainability

Invasive species are non-native organisms that cause harm to ecosystems. An invasive amphipod (scud) is present in the Chicago Waterway System (CAWS) which has the potential to spread into the Great Lakes. Based on the high densities that it reaches and its potential ecological harm, scud is listed in the US Army Corps of Engineers' Great Lakes and Mississippi River Interbasin Study as a High-Risk Aquatic Invasive Species. We developed a lab-scale electric barrier mimicking the existing electric barrier present in the CAWS which deters Asian carp. We will present the effects the electric barrier imparts on the scud.

◆Poster 90◆

Developing a Model for Quality of Life and Applying It to the Neighborhoods of Chicago

Presented by Matthew Krishnan; Mulcahy Scholars Program

Supported by Dr. Frederick Kaefer, Information Systems

This research develops a quality of life metric based on environmental, social, and economic indicators and investigates the disparities seen in neighborhoods of Chicago. Statistical analysis is performed on significant independent variables that factor into quality of life. Some of these variables include the air quality, presence of food deserts, education, crime rate, and class mobility indices. Additional examination of currently published research is conducted to discern other possible variables to be used to define and measure quality of life. Historical analysis of Chicago neighborhoods is conducted to explain the gaps in the quality of life.

◆Poster 91◆

Design and Synthesis of Indoline 7-sulfonamide Inhibitors of DapE as Potential Antibiotics

Presented by Ademilola Tejuoso; Mulcahy Scholars Program

Supported by Dr. Daniel Becker, Chemistry and Biochemistry

The issue of antibiotic resistance is a critically important issue for society, for patients, and healthcare providers. Few advances toward new antibiotics have recently emerged. In order to combat this challenge, we are targeting the bacterial enzyme DapE which is a di-zinc metalloenzyme in the biosynthetic pathway of lysine and m-DAP, both essential in bacteria for building cell walls. However, DapE is not present in humans. We are designing and synthesizing indoline N-acyl-7-sulfonamides toward potent inhibitors of DapE. Targeting inhibition of DapE should lead to selective toxicity to bacteria for the discovery of a new class of antibiotics.

◆Poster 92◆

Effects of Pharmaceuticals on Stream Microbial Communities

Presented by Benjamin Lorentz; Mulcahy Scholars Program

Supported by Dr. John Kelly, Biology

Pharmaceuticals and personal care products (PPCPs) have become ubiquitous in aquatic ecosystems. Urbanization and an increase in human population have increased the amount of PPCPs. Individual PPCPs have shown effects on the structure of aquatic environments when introduced at non-lethal dose levels. Widespread affect of PPCPs on microbes is not well understood. Biofilms, as primary producers affect many other organisms when affected themselves. This study aims to evaluate if

light coverage as well as growth media affect the composition and abundance of microbials in aquatic ecosystems. Results from this study can help better understand how pharmaceuticals affect microbes in streams.

◆Poster 93◆

EphrinA's are Expressed in Lingual Epithelium and Necessary for Normal Sensory Innervation

Presented by Albert George; Mulcahy Scholars Program, Provost Fellowship

Supported by Bill Rochlin, Biology

Ephs and ephrins are cell surface proteins that act as ligands and receptors for one another, initiating signaling cascades that can cause repulsion, arborization, or growth promotion of axons. Here, we investigate the role of EphA/ ephrinA signaling in the innervation of gustatory papillae in the taste system. While gustatory axons are penetrating fungiform papilla epithelium in mice, anti-ephrinA1, -A3, and -A5 label is present in the epithelium, though lacking in intensity in papillae. In situ hybridization results supports these findings. Preliminary results from triple knockout mice lacking ephrin-A1, -A3 and -A4 suggest that normal innervation depends on ephrin-A signaling.

◆Poster 94◆

Catalyst Behavior in Metal-Catalyzed Carbonyl-Olefin Metathesis

Presented by Mary Psaltakis; Mulcahy Scholars Program

Supported by Dr. James Devery, Chemistry and Biochemistry; Carly Hanson, Chemistry and Biochemistry

Iron(III)-catalyzed carbonyl-olefin ring-closing metathesis employs reactivity not typically observed in Lewis acid-catalyzed reactions. Importantly, the reaction requires the Lewis acid to differentiate between the carbonyls of the substrate and byproduct. Herein, we report detailed kinetic, spectroscopic, and colligative measurements applied towards the identification of the solution structures of the active Fe(III) and Ga(III) carbonyl-olefin metathesis catalysts. Fe(III) and Ga(III) behave similarly under stoichiometric conditions however, they diverge when under superstoichiometric conditions. These findings are consistent with the identity of the Fe(III) metathesis catalyst changing over the course of the reaction.

◆Poster 95◆

3D Projecting Using A Fast TN Cell

Presented by Matthew Conway, Hans Johnson, Nicholas Corkill

Supported by Dr. Robert Polak, Physics

3-D projection uses polarization to encode information about an image for each eye. These images are formed through the use of orthogonal circularly polarized light. Modern systems use liquid crystal cells to switch between the two orthogonal states quickly, allowing for 48 individual frames—24 for each eye—to be shown in one second. Typical systems use liquid crystal pi cell to accomplish but since these are difficult to manufacture, we investigated if using a fast twisted nematic liquid crystal cell would produce the correct polarizations fast enough to produce 3-D images.

◆Poster 96◆

Predictors of Referral Completion in Pediatric Concussion Patients and Related Effects on Recovery Time

Presented by Kiana King

Supported by Dr. Pamela Osenkowski, Biology; Dr. Jamie Burgess, Ann & Robert H. Lurie Children's Hospital of Chicago;

Sina Malekian, Ann & Robert H. Lurie Children's Hospital of Chicago; Jacob Wild

Pediatric concussion patients are frequently referred to physical therapy (PT) and ophthalmology (OP), though not all patients complete their referral orders. Our study aimed to identify patient factors predictive of completing PT/OP referrals and resulting effects on number of days post-injury to return-to-learn (RTL). Retrospective data collection for 313 patients (14.1±2.3 years; 64.2% female) included demographics, medical history, injury mechanism, and insurance status. Bivariate analysis showed history of anxiety associated with PT/OP referral completion. Multivariable linear regression showed increased symptom loads and PT/OP referrals (whether complete or incomplete) to predict delayed RTL. Further investigation is needed to elucidate this effect.

◆Poster 97◆

Optimizing Gene Predictors in Diverse Populations

Presented by Jennifer Takamura, Elyse Geoffroy; Biology Summer Research Fellowship, Mulcahy Scholars Program

Supported by Dr. Heather Wheeler, Biology and Computer Science

Genetic studies are predominantly performed on European populations, however, these results cannot be accurately applied to non-European populations. We will expand the current database of gene expression prediction models for multi-ethnic popula-

tions using data from the International HapMap Project and from Stranger et al. 2012. Using a gene-association test that predicts gene expression levels for complex traits, we applied current multi-ethnic models and our own gene expression models to public summary statistics data from a study done on lipid levels in Asian populations. We found one significant gene, SIK3 on chromosome 11, associated with lipid levels.

◆Poster 98◆

Being the Change & Being Changed

Presented by Mary Margaret Morber

Supported by Andrew Miller, Center for Experiential Learning; Kaori Paxton, Catholic Charities

For my Social Justice Internship, I worked at Catholic Charities' Refugee Resettlement Agency in their K-12 department. I went into the internship with a mindset of "being the change I wished to see in the world". But as the world seemed to throw change back in my face, I learned that sometimes the most meaningful change isn't making an idealistic dream come true, but in how you work towards that goal no matter how far away or futile it may seem, and letting that process change you.

◆Poster 99◆

Dissecting the Coordination of DNA Bending and Cleavage by the DNA Repair Protein Fpg

Presented by Jerrin Mathew; Mulcahy Scholars Program

Supported by Dr. Brian Cannon, Physics

The maintenance of genomic integrity requires an array of repair proteins to locate, identify, and process DNA damage sites. Oxidized bases, in particular 8-oxoguanine, represents one of the most common forms of DNA damage due to environmental stress. In bacteria, repair of 8-oxoguanine occurs by the action of the protein formamidopyrimidine (Fpg), which locates the damage site and cleaves the DNA strand to remove the oxidized base. Using single-molecule microscopy and UV spectrophotometry, we have sought to dissect two discrete steps in Fpg's interaction with damaged DNA: a conformation change induced in the DNA and the excision of the base.

◆Poster 100◆

Sucrose Synthase Specificity: Structure-Function Relationship Studies in the Enzyme from *Nitrosomonas europaea*

Presented by Mira Sethi; Mulcahy Scholars Program, Provost Fellowship

Supported by Jaina Bhayani; Dr. Miguel Ballicora, Biochemistry and Chemistry

Sucrose plays an integral role in sugar sensing, development, and regulation of gene expression. Sucrose synthase, an enzyme found in plants and bacteria, catalyzes the cleavage of sucrose using a nucleotide (ADP or UDP). The enzyme from plants prefer UDP, whereas *Nitrosomonas europaea*, a bacteria, catalyzes the cleavage of sucrose using ADP, making ADP-glucose and fructose. The crystal structure of sucrose synthase shows M565 interacting with ADP, one of the substrates in the reaction. We evaluated this interaction by site directed mutagenesis and found that leucine replaced methionine well, implying that hydrophobicity is important to bind the nucleotide.

◆Poster 101◆

Understanding the Drug-Host Relationship of the Microbiome and Common Chemotherapeutics in Colorectal Cancer Patients.

Presented by Maryam Khalid; Mulcahy Scholars Program

Supported by Dr. Michael Burns, Biology

Colon Cancer is notorious for its high mortality rates in the US. Sepsis, bacterial infection, is prominent among the colorectal cancer population. One factor commonly considered for the rise of sepsis is the harsh side effects of chemotherapy drugs. However, many undermine the effects of chemotherapy on the diversity of the gut microbiome, which are microbial communities within a system. In order to gain a better understanding of the drug-host relationship, a dose dependent experiment was run using Cisplatin, Fluorouracil, Capecitabine, and Cyclophosphamide. Drugs were administered with three dosages to bacterial community samples.

◆Poster 102◆

Gene-Based Association Study of Bipolar Disorder and Schizophrenia in African Americans

Presented by Peter Fiorica; Carbon Undergraduate Research Fellowship, Mulcahy Scholars Program

Supported by Heather E. Wheeler, Biology

In the past fifteen years, genome-wide association studies (GWAS) have provided novel insight into the genetic architecture of various complex traits; however, this insight has been primarily focused on homogeneous populations of European descent. With African Americans making up less than two percent of neuropsychiatric GWAS, this discrepancy is magnified in diseases

such as schizophrenia and bipolar disorder. In this study, we performed GWAS and gene-based association studies, PrediXcan, for schizophrenia and bipolar disorder in two separate cohorts (n=2,340; n=1,045) of African American individuals. We found seven genes significantly associated with schizophrenia and one gene significantly associated with bipolar disorder.

◆Poster 103◆

Familism and Its Impact on Anxiety on Urban Latino Youth

Presented by Ramiro Jimenez

Supported by Laura Distel, Clinical Psychology; Sarah Jolie, Clinical Psychology; Dr. Catherine DeCarlo Santiago, Clinical Psychology

The present study aims to examine the relationship between familism and anxiety among low-income, Latino youth. Previous work explored the benefits of familism on other forms of mental health (Stein et al., 2015), but few researchers have explored the effects of familism on anxiety among low-income Latino youth. As one of the largest growing populations, it is important to investigate how Latinos are dealing with anxiety. Their resilience to other mental health ailments is indicative of some form of protective factor which could be employed in intervention programs. Data collection consisted of three, three-hour home visits, spaced six months apart.

◆Poster 104◆

University Students' Appraisal of Mental Illness Stigma: Examining Differences by Age, Gender, and Ethnicity

Presented by Kiarra Pittman

Supported by Noni Gaylord-Harden; Elizabeth Sargent, Psychology

The current study examined differences in students' appraisals of prejudice against mental illness and perceived resources in 73 Loyola college students ages 18-26 (M = 19, SD = 1.3; 74% White; 86% female) participating in an intervention to reduce mental health self-stigma. Results showed no significant differences in self-stigma between gender or ethnicity. Freshman scored significantly higher than Juniors (F = 3.5, p < .05). The current study found that the year in school related to mental health self-stigma. Future research should analyze samples with greater racial/ethnic and gender diversity to better understand how demographic factors relate to stigma.

◆Poster 105◆

Control of Neuronal Activity in the Buccal Ganglion of *Aplysia californica* with Magnetic Stimulation

Presented by Jessica Helon; Biology Research Fellows Program, Provost Fellowship

Supported by Hui Ye, Biology

Transcranial magnetic stimulation (TMS) has shown great potential in neural stimulation for the treatment of neurological diseases, such as depression and epilepsy. Magnetic stimulation offers advantages in specificity, biocompatibility, and efficiency in comparison to traditional electrical stimulation. The neurons in sea slug *Aplysia californica* provide a valuable system for the study of magnetic control of neuronal excitability. In particular, neurons inside the buccal ganglion are large, making them easy targets for the coil-generated electromagnetic fields. In this study, I utilize extracellular electrophysiology and magnetic stimulation to inhibit and excite neuronal activity of neurons in the buccal ganglion of *A. californica*.

◆Poster 106◆

The Relation Between Sleep and the Behavioral Inhibition System Among Undergraduates with Disordered Eating Patterns

Presented by Anna Sroka

Supported by Amy Heard Egbert, Clinical Psychology

Research indicates that individuals with disordered eating patterns experience various sleep difficulties. These individuals also tend to be sensitive to punishment, such that they score high on the Behavioral Inhibition Scale (BIS), a factor related to elevated levels of stress and poor sleep quality. However, little is known about how sleep is related to behavioral inhibition among individuals who demonstrate disordered eating patterns. This study analyzed significant correlates across 279 undergraduates with and without disordered eating patterns. Results from an ANOVA indicate a necessity for more sleep for those who are more sensitive to punishment, regardless of disordered eating concerns.

◆Poster 107◆

Using Feeding Behavior in *Drosophila* to Explore Tissue Autonomous Circadian Regulation

Presented by Daniel Jabr; Mulcahy Scholars Program

Supported by Dr. Daniel Cavanaugh, Biology

The circadian system regulates rhythmic behavioral outputs, the most extensively studied of which is locomotion. Recent studies have demonstrated circadian control of feeding independent of locomotion, but the neuronal circuitry governing feeding

rhythms is not understood. Molecular clocks are present in a central clock in the brain and peripheral tissues such as the *Drosophila* fat body, which is homologous to the mammalian liver and regulates metabolism. Here, we investigate the feeding behavior of transgenic flies in which we change the speed of the brain or fat body clock to identify the contributions of locally distinct circadian clocks to feeding rhythms.

◆Poster 108◆

Exploring the Healthcare Experience of Eritrean Refugees

Presented by Radia Daud; Provost Fellowship

Supported by Dr. Jorgia Connor, Marcella Niehoff School of Nursing

Often Coming from refugee camps, Eritrean Refugees typically arrive to U.S with pre-existing conditions and limited understanding of their overall health. When they arrive, they are faced with many barriers that prevent them from having continuous access to care as well as receiving quality healthcare. Building on the very limited research that has been done on Eritrean refugees, this study will shed light on the healthcare experience of Eritrean Refugees and aims to help healthcare providers gain insights into the needs of this group as expressed by the healthcare-seekers themselves.

◆Poster 109◆

Creating A Nitinol Engine to Study the Thermodynamic Cycle

Presented by Jared Rafferty, John Mikos, Sebastian Oleksy

Supported by Robert Polak, Physics

Nitinol is a nickel and titanium alloy that displays elasticity and shape memory at specific temperature ranges depending on the exact mixture of titanium and nickel. When heated to specific temperature ranges, nitinol will contract with a noticeably greater force than is necessary to stretch it at lower temperatures. By using a pinball as an additional mass to deform the nitinol spring in its heated state, we can measure its force-length variance to calculate the amount of mechanical work done by the spring. The completed device can be used as an experimental laboratory to demonstrate the thermodynamic cycle and the efficiency of a heat engine.

◆Poster 110◆

Using Molecular Dynamics to Understand Surfactant-Drug Interactions

Presented by Maryana Gogol

Supported by Ken Olsen, Biochemistry

In my presentation, I am using molecular dynamics (MD) simulations to better understand surfactant-drug crystal interactions. Low aqueous solubility is the major challenge encountered during the development of new drug. Blocking the growth of nano-crystals can enhance the solubility of the drug. Surfactants do this by binding to the surfaces of the crystal. Molecular dynamics (MD) simulations were conducted with nano-crystals of the drug celecoxib and sodium taurocholate surfactant. The long-term goal of this research is to find out the most effective way to deliver drug and dissolve it efficiently.

◆Poster 111◆

Identifying the Role of DN1 Cells in Circadian Rhythms in *Drosophila*

Presented by Ella Nettin; Biology Research Fellows Program

Supported by Dr. Cavanaugh, Biology

Most organisms display daily oscillations of biological and behavioral processes known as circadian rhythms. Much is still unknown, however, about the connection between clock cells in the brain and behaviors of organisms. The focus of this project is to understand the role of a subset of clock cells, the DN1 cells, in regulating circadian rhythms in *Drosophila melanogaster*. We have developed genetic tools that allow us to drive expression of certain genes selectively and comprehensively in the DN1 cells. These genes are now being used to disrupt functioning of these cells to examine the subsequent effects on behavioral rhythms.

◆Poster 112◆

Determining Distributions of Invasive Macroinvertebrates in the Des Plaines and Illinois Rivers

Presented by Megan Barrera, Julianna Scivinsky

Supported by Reuben Keller, Environmental Science

The introduction and establishment of invasive species have had significant impacts on the freshwater ecosystem of the Great Lakes. In order to mitigate the effects of invasive species, assessments of their current and historic locations are essential. This study investigates the presence and spread of invasive macroinvertebrates in the Illinois and Des Plaines Rivers of northern Illinois. Our study data has been compiled from 2015 to 2018 and our researchers primarily used Hester-Dendy (HD) artificial

substrate samplers. Laboratory assessment of the macroinvertebrates began with sample sorting by visual analysis using magnifying lamps. Species identification was verified using stereo microscopes.

◆Poster 113◆

Cost Benefit Analysis of Small Scale Sustainable Mushroom Cultivation

Presented by Ethan Holleman; Provost Fellowship

Supported by Dr. Zhenwei Zhu, Institute for Environmental Sustainability; Phoenix Bean

Through the summer Provost Fellowship, this project investigated the viability of a small scale gourmet mushroom cultivation business. Mushroom production utilized diverted organic wastes from local tofu producer Phoenix Bean as the primary growth medium. Two varieties of Oyster mushrooms were cultivated and then handed off for sale at the Loyola Farmer's market by IES greenhouse interns. Important practical information for small scale growers was recorded throughout the project's duration and at its conclusion a cost-benefit analysis was performed to assess the operations economic potential.

◆Poster 114◆

The Cognitive Differences between Musicians and Non-musicians

Presented by Abubakr Waheed, Mukhtar Naqvi, Asad Hassan

Supported by Dr. Raymond Dye, Cognitive and Behavioral Neuroscience

Our group is presenting a study on the cognitive differences between musicians vs. non-musicians. Via a series of three studies, we describe the MUSEBAQ questionnaire, which combines elements of several previous music questionnaires but combines them into a single modular instrument. The aim of developing this instrument is to help researchers and practitioners obtain a robust profile of music background and capacity, music preferences, and motivations for using music from a relatively brief and well validated survey.

◆Poster 115◆

Size Matters: Neuronal Response is Dependent on its Size under Electrical Stimulation

Presented by Vladislav Souboch, Diana Mahlis

Supported by Dr. Hui Ye, Biology

The heterozygosity of cell size has profound implications for treatments. We explore the impact of cellular size on their responses to electric current stimulation, by contrasting the large B3 and small B8 neurons in *Aplysia californica*. We found that B3 neurons are more responsive to both depolarizing and hyperpolarizing currents than B8 neurons. Computational simulation revealed this is due to larger membrane capacitance in the B3 neurons. Understanding differing responses of cells to electric stimulation is vital when dealing with electric current based treatments (such as deep brain stimulation) in heterozygous cell mixtures.

◆Poster 116◆

Extrapolate the Function of YczE to Identify Novel Drug Targets

Presented by Harjot Uppal; Mulcahy Scholars Program

Supported by Dr. Liu, Biochemistry

Drugs are used every day in the forms such as antibiotics, pain killers, and cancer medicines et al. Pharmaceuticals function via interactions with biological systems. Specifically, most drugs, over 40 %, work by interacting with membrane proteins. Functions of membrane proteins are particularly difficult to study due to their lack of stability, and partially hydrophobic surfaces. To circumvent the difficulties, the goal of this project is to extrapolate the function of a currently unknown membrane protein (YczE) via studying its' transcription regulator (YczR). YczE, a transmembrane protein of *Klebsiella pneumoniae*, a notoriously antibiotic resistant strain.

◆Poster 117◆

The Roles of Robo and Wnt in Embryonic Cell Proliferation

Presented by Samuel Jaros, Nicholas Sedlacek; Mulcahy Scholars Program, Provost Fellowship

Supported by Thomas Sanger, Biology

Wnt is a gene common throughout the animal kingdom. Previous research in the Sanger Lab has shown that heat shock from rising global temperatures can interfere with this essential pathway. In this research, we are attempting to link Wnt and Robo, a gene family essential in nerve axon direction. Our results may have important impacts in future climate change debates.

◆Poster 118◆

Perfecting the Experimental Setting by Custom-Designing Rabbit Stereotaxic Frames

Presented by Katarzyna Czyz; Provost Fellowship

The exact mechanism or concept behind how electrical stimulations assist or enhance the recovery process of neurological ailments are not yet fully understood, suggesting the need to conduct more thorough examination of electrical stimulation parameters by using an animal model in place of human or cellular samples to gain insights that are not attainable in current studies. As the proposed project requires a larger animal (rabbit) for force measurements due to limitations of force transducer (strain gage) resolution, the fixation and stereotaxic frames would have to be customized both to account for the animal size and the installation of strain gages. Hence, we will be designing our own frames by using 3D design software and building it with our own 3D printer.

◆Poster 119◆

Evaluation and Utilization of DNA "Barcodes" to Enhance the Efficacy of Clover Species Identification

Presented by Reema Martini

Supported by Dr. Howard Laten, Biology

Accurate identification of plant genomic resources is essential for phylogenetic analyses, agronomy management, and genetic diversity characterization. Due to errors among germplasm banks, there is a need to investigate the accuracy of their germplasm identifications. This project aims to characterize species based on certain "barcode" regions in their genetic code. These regions contain sufficient interspecies variations to identify sample species. This study focuses on the potential of matK and trnL chloroplast regions, as well as the Internal Transcribed Spacer region of the ribosomal RNA gene, to identify *Trifolium* species.

◆Poster 120◆

Development of New Catalysts Through the Synthesis and Characterization of High-valent Metal Complexes

Presented by Keit Dine; Mulcahy Scholars Program, Provost Fellowship

Supported by Dr. Wei-Tsung Lee, Chemistry and Biochemistry

Transition metal complexes are often used in catalysis because the metal center can take on many oxidation states. These metal complexes utilize metals like gold, platinum, and palladium because of their ability to control chemical and physical properties of reactivity. Because these metals are both expensive and rare, new metal complexes need to be developed that use metals that are inexpensive and function as efficient catalysts. This proposal focuses on the design and synthesis of high-valent metal complexes using first-row transition metals. Given that these metals are inexpensive and have many oxidation states, they are promising candidates for future catalysts.

◆Poster 121◆

Sex Discrimination and Traditional Gender Roles: Advancements and Barriers for Women Entering the Medical Profession in the 1970s

Presented by Jenna Ludwig

Supported by Dr. Elizabeth Shermer, Professor, History; Ruby Oram, History

The rise in female students applying to and entering American medical schools in the 1970s coincided with the advancement of equal rights legislation in addition to a growing acceptance of women in the public sphere. However, unequal family responsibilities, a discriminatory environment, and the masculinized image of a competent physician all acted as obstacles to women's success in the medical profession during that decade. Confining gender roles and continuing sex discrimination within the medical profession hindered women from succeeding at the same pace as their male peers, thus preserving the heavily masculinized environment.

◆Poster 122◆

Biannual Harvesting of Invasive Hybrid Cattails Alters Nutrient Availability in Great Lakes Coastal Wetland

Presented by Olivia Niosi; Provost Fellowship

Supported by Drew Monks, Institute of Environmental Sustainability

Dominance of the hybrid cattail (*Typha x glauca* [*T. latifolia* x *T. angustifolia*]; hereafter *Typha*) has altered the resilience of Great Lakes coastal wetlands. *Typha* establishes large, monotypic stands that suppress native vegetation and establish positive feedback loops that further favor its dominance. I statistically analyzed plant root simulator (PRS) probe nutrient data and vegetation surveys from a *Typha*-invaded marsh to investigate the dynamics between *Typha* growth, water levels, and nutrient availability. The goal of this study was to explore influences of nutrients beyond the well-studied nitrogen and phosphorus and ways PRS probe data can be utilized in wetland research.

◆Poster 123◆

Investigation of the Effect of Orthophosphate in Lead Mitigation in Drinking Water

Presented by Tonyisha Harris

Supported by Dr. Laura Brentner, Institute of Environmental Sustainability; Zhenwei Zhu, Loyola Environmental Testing Laboratory

Lead leaching in drinking water is becoming a prevalent and over-overlooked yet pressing problem in the United States. Orthophosphate is constantly suggested as a solution and this experiment was conducted to study the interactions of orthophosphate on lead leaching with currently used piping materials: galvanized and copper. Galvanized pipes quickly consume orthophosphate to create a protective coating the first 30 to 60 minutes of running the experiment. Copper would be a better piping material because it eliminates the source of lead, consumes less orthophosphate to create a protective coating, and orthophosphate is more effective at reducing lead in water with copper pipes.

◆Poster 124◆

Metal-Catalyzed Carbon-Heteroatom Bond Forming Reactions

Presented by Priya Patel; Mulcahy Scholars Program

Supported by Dr. Hee Yeon Cho, Chemistry and Biochemistry

Organophosphorous chemicals have been advantageous in numerous areas of research, in specific phosphines. In the recent years, research has been focused on the development of C-P bond formation via C-O bond activation. Various methods have been reported; however, the transition metal C-P formation has yet to be secured with definitive research. The ability to substitute fluorine into a molecule is of high interest in organic research. One of the methods involve a decarboxylation reaction. In terms of medicine, some affects of fluorine include various affects on metabolic activity, in vivo half life, bioavailability, and modified protein interactions.

◆Poster 125◆

Comparing the Consistency of Nucleic Acid Extraction of Human Gut Microbiota from Extraction Kits that Use Various Lysing Technologies.

Presented by Sumeed Manzoor

Supported by Michael Burns, Biology

The human gut microbiota consists of over 10,000 diverse species of archaea, bacteria, and viruses. Some species are easy to lyse while others are difficult due to unique or complex cellular membrane, which poses a problem for nucleic acid extraction. Thus, a variety of technologies incorporating mechanical and chemical methods for lyses are used by microbial nucleic acid extraction kits. We would like to use microbial nucleic acid extraction kits that use a variety of methods for lyses to extract DNA from human gut microbiota and analyze the nucleic acid yield and quality and species makeup using 16S rRNA sequencing.

◆Poster 126◆

The Biblical Inspiration Behind Locke's Theory of Property

Presented by Amy Al-Salaita

Supported by Dr. Martin Claar, Political Science

Traditionally, John Locke is thought of as one of the fathers of modern capitalism, who bases his philosophy of property rights heavily in the Bible. Locke argues that through Creation, God gave the world to men in common, and men must use it in the most productive way possible. Physical labor becomes a marker for possession, but not all men are truly equal. Based on the Book of Genesis as well as the teachings of Christ found in the Book of Mark, and the Christian doctrine found in Acts and James, Locke's property rights conflict with the biblical intention for the creation of the world.

◆Poster 127◆

Photolysis of Emerging Contaminants absorbed on Plastic Debris in an Aqueous Environment

Presented by Angeline Marie Alag, Grace Bell; Mulcahy Scholars Program

Supported by Dr. M. Paul Chiarelli; Kathryn Renyer; Xiolmara Martinez, Chemistry and Biochemistry

Plastic debris and their decomposition products are a class of environmental contaminants that are widely distributed throughout the world. Plastic pollution in aquatic environments may cause ecological harm in several ways. One such mechanism involves the microplastic-mediated transfer of toxic compounds to aquatic organisms. Plastic pollution in freshwater and marine environments will absorb a variety of potentially toxic compounds with little water solubility, including toxic compounds. Aquatic organisms consume these microplastics thus accelerating the uptake of toxic compounds causing premature death. Our study examines several factors that influence the rate of triclosan photolysis when absorbed on different types of plastic.

◆Poster 128◆

Analysis of Vascular Damage Healing Post Interventional Radiological Procedure

Presented by Daniel Derylo

Supported by Dr. Fawad Qureshi, Vascular Access Centers of Illinois; Dr. Bogdan Derylo, Vascular Access Centers of Illinois; Dr. Mark Leischner, Vascular Access Centers of Illinois

This is an observation study involving an 82 year old patient that had a thrombectomy procedure for a clotted brachial-basilic AVF, complicated by the symptomatic embolization of the brachial artery. Embolectomy was performed using an over the wire fogarty balloon. Unfortunately, significant damage resulted following embolectomy as documented by the post procedure arteriograms. The damage involved loss of smaller arterial branches. Arteriograms were performed over a 5 month period to analyze the recovery of brachial artery injury.

ORAL PRESENTATIONS

12:45 PM - 2:15 PM

MUNDELEIN 203

People First Language: An Overview of Service, Exploration, and Personal Growth As A Future Nurse

Presented by Andrea Jalloh

Supported by Andrew Miller, Center for Experiential Learning

As a Social Intern at Misericordia, I had the honor to work towards the mission of enhancing the potential for persons with mild to profound developmental disabilities, many of whom are also physically challenged. Working alongside the Social Service team in different settings, I recap on my experiences and the valuable lessons I take with me to nursing school and my future ambitions. Along with the new language I plan to use.

Social Justice Internship: Government Affairs

Presented by Mario Guerrero

Supported by Andrew Miller, Center for Experiential Learning

Through the Social Justice Internship program, I had the opportunity to be a part of Catholic Charities' Government Relations Department. As a community-based social service provider, Catholic Charities relies heavily on the government for policy and funding. The Government Relations (GR) Department brings the majority of the funds to the agency through grant applications from the local, state and federal levels. Additionally, the GR Department continuously works on building strong relationships with legislators across the state to advocate on behalf of its clients.

Examining the African Diaspora through Women's Artwork

Presented by Seraphina Meacham; Social Justice Fellowship

Supported by Cristina Lombardi-Diop, Rome Studies, Modern Languages and Literatures, Women's Studies and Gender Studies

Examining the stories of immigrant women helps to eradicate the stigma against immigrants, and also broaden the narrative beyond the few stories that do manage to make it to the news. The ability of immigrant women to create artwork in the way they want gives them an agency that may not exist otherwise in their day to day life. Shining a light on these stories and the themes that emerge through their artwork – such as triumph, tragedy, and desire for normalcy – will hopefully make more those who have either a negative view of immigrants or suffer from “a single story” perspective of immigrants broaden their own narrative.

MUNDELEIN 204

Top Box Foods: Research for Equality in the South and West side of Chicago

Presented by Chase Wright, Michael Watson, Kamille von der Linden, Nick DiCello, Stephanie Delgado, Robert Belardi, Michaeln Pham

Supported by Dr. Stacy Neier Beran, Marketing; Gina Champion, Ipsos; Nicki Loduca, Ipsos; Tyler Monroe, Weber

Top Box Foods, a non-profit organization focused on bringing fresh produce and proteins to food deserts in the South and West sides of Chicago. After our research, our client can conquer food deserts beyond these areas. The main focus of our research involves our group members volunteering with the client and leading focus groups. Quantitative data through surveys by way of Qualtrics will also be used. The data collected will allow us to make recommendations to the client so they can acquire more customers. Our research not only helps our client, but also improves lives of those in need.

Top Box Foods Regarding Customer Acquisition

Presented by Alexa Brennan, Isabella Pradhan, Safaa Karoumia, Elizabeth Ciaramitaro, Jacob Sierra, Martin Savaria;

Supported by Dr. Stacy Neier Beran, Marketing; Patricia Zhang; Austin Tolentino

Team Star acknowledges customer acquisition as Top Box's most significant business issue. Those who buy their food from TBF are brand loyal, however, TBF needs to reach more of these customers. We believe that they should utilize their powerful mission to drive their brand narrative. TBF was named by a number of respondents as a favorite store, although it appears that

most shoppers do not use Top Box or any other single grocer exclusively. Our research objective topics include marketing strategy, brand narrative, accessibility, incentives, and retention.

Top Box Foods: New Strategies' Implementation

Presented by Giselle Dassum, Gustavo Garcia, Santiago Velasco, John Peters, Chris Baba, Xiaohui Tan

Supported by Dr. Stacy Neier Beran, Marketing; Jason Bilbrey, Top Box Foods; Jonathan Wittig, Top Box Foods

Our presentation will be focused on the new strategies that are going to be implemented by Top Box Foods to gain customer loyalty resulting in a broader market segmentation.

MUNDELEIN 205

Inhibitors of Hepatocellular Carcinoma Target, Ornithine Aminotransferase

Presented by Denis Cipurko; Carbon Fellowship

Supported by Dr. Dali Liu, Chemistry and Biochemistry; Dr. Daniel Becker, Chemistry and Biochemistry; Dan Catlin, Chemistry and Biochemistry Department

Ornithine Aminotransferase (OAT) has been implicated in the pathogenesis and growth of hepatocellular carcinoma, the most common primary liver cancer in adults, due to its role in supplying nitrogen containing metabolites to anabolic pathways. Inhibiting the activity of OAT can result in slowed cancer growth or tumor reduction.

Pyridoxal 5' Phosphate (PLP) is a cofactor of OAT that participates in the mechanism of the reaction that OAT catalyzes and is essential to enzyme activity. Inhibition of OAT is achieved through the design and introduction of small molecule, mechanism-based inactivators and PLP analogues.

Spectroscopic Analysis Using Solution IR of Carbonyl and Lewis Acid Complexes

Presented by Janiel Cortes; Mulcahy Scholars Program

Supported by James Devery, Chemistry and Biochemistry; Carly Hanson, Chemistry and Biochemistry

A presentation that plans to educate an inform listeners about the work that our lab has done in the use of solution IR to observe the change of Lewis acid and carbonyl complexes that are not 1:1, something that has been observed prior. We detail what effect this has in our understanding of forming the mechanism and understanding the mechanistic steps of our Carbonyl Olefin Metathesis (COM) reaction.

Development of Ring-Opening Carbonyl-Olefin Metathesis

Presented by Amanda Morgan; Mulcahy Scholars Program

Supported by Dr. James Devery, Chemistry; Carly Hanson, Chemistry

Olefin-olefin metathesis is often used to construct complex carbon-carbon double bonds. This is a process that has aided in the synthesis of high-value organic molecules. However, the analogous carbon-olefin metathesis reaction has received little attention until very recently. The mechanistic studies presented focus on understanding and improving Fe(III)-catalyzed carbonyl-olefin metathesis, a new approach for the cycloalkene construction. We predict that successful reactivity relies on an oxetane-forming Fe(III)-mediated [2+2]-cycloaddition followed by Fe(III)-mediated cycloreversion to the metathesis product, and that the examination and characterization of this process will reveal new avenues of reactivity.

MUNDELEIN 303

Is the Music Industry in Treble?: Distribution of Music Revenue from 1997-2017

Presented by Marirose Rueth, Jessica Pedroza

Supported by Dr. Anne Reilly, Quinlan School of Business

Through a supply chain and marketing lens, this project analyzes how the distribution of revenue within the music industry in the U.S. has been impacted with the development of technology for listening to music between 1997 and 2017. The scope of this project is the effect of evolution in music technology on the source of where musical artists receive their income (i.e. concerts vs. album sales). Interest in this project scope stems from the presenters' prior experience in the performing arts realm as well as their studies in Supply Chain Management and Marketing.

Economic Sustainability in a 'Rich Man's World'

Presented by Stephanie Lancz, Cheyenne Penny
Supported by Dr. Anne Reilly, Management

To what extent does environmental sustainability affect economic growth, standard of living, and health of a country? This project focuses on identifying the key economic indicators, GDP, GDP per capita and HDI, behind a country's economic sustainability ranking. We compare these indicators for the top and bottom 10 sustainable countries. Overall, GDP per capita serves as the optimal indicator of a country's economic sustainability ranking. In our project, we explore ways that governments and companies can increase this indicator. Hence, more research should be conducted to coincide with our results pertaining to policies that promote emotional, physical, and mental well-being.

Inequality and Over-Assessment

Presented by Olivia LaRocco, Quinlin Unrau
Supported by Tim Classen, Economics; Andrea Raila, Raila & Associates

Project explores regional difference in property tax assessments within Cook County suburbs through using a multivariable regression analysis. The study looks at factors like race, income, region, and sales price to analyze how marginalized communities see the highest property taxes relative to property value.

MUNDELEIN 304

Foaming Biodiesel Soap

Presented by Patrick Cichon, Ryan Gippner, Joshua Lopez
Supported by Dr. Baura, Engineering; Dr. Ali, Engineering; Mr. Waickman, Biodiesel Lab

Our project focused on creating a more favorable biodiesel foaming soap that will be implemented across the Loyola campuses. Using surveyor feedback and 2^K factorial, we were able to find the ideal foaming soap composition.

Anatomical Model: IV Catheter Insertion

Presented by Signy Weber, Audrey Woodward, Madelyn McCullen, Alex Brindza
Supported by Dr. Baura, Engineering Science; Dr. Chen, Engineering Science; Dr. Kostovich, School of Nursing

This past semester, our group proposed and designed an anatomical model that accurately reflects the anatomy of the arm when correctly and incorrectly inserting an IV catheter. Working with the nursing department, we decided on a hollow, half-dome design with an anatomically correct cross section representing the major veins and arteries in the arm, created via SolidWorks.

Pediatric Gastrostomy Model

Presented by Lynn Tran, Nathaniel Hort-Ly, Anisha Kapoor
Supported by Dr. Kostovich, Dr. Baura, Dr. Chen

A model of a pediatric gastronomy system for the purpose of providing experience to nursing students involving pediatric patients. It is a vertical apparatus of the system which includes the esophagus, stomach, and sphincter leading to the intestines, as well as an insertion area for the feeding tube.

MUNDELEIN 307

Assistive Technologies Space

Presented by Georgia Cogsdill, Evelyn Zurawski, Jaad A'Rafat, Milos Popratnjak
Supported by Dr. Ryan; Dr. Baura; Dr. Ali

Loyola's Information Commons (IC) is a place for students to comfortably do homework, use computers, or relax, among other uses, while having a beautiful overlook of Lake Michigan. Many students and faculty may be surprised that there is an assistive technologies room on the second floor, created to benefit students with learning and/or physical disabilities. However, this room needs upgrading, from the actual space to the equipment inside. It is crucial to find a more convenient layout that contains both accessible, and equally functional, tools for learning to help our fellow Loyola students.

Pediatric Tracheotomy Anatomical Model

Presented by Cassandra Grosskopf, David Grimm

Supported by Dr. Vincent Chen, Engineering Science; Dr. Gail Baura, Engineering Science; Dr. Carol Kostovich, School of Nursing;

There are no current pediatric tracheotomy models for the nursing students to implement. We worked alongside Dr. Carol Kostovich to create an accurate 3D plastic printed pediatric size model for teaching and learning purposes.

Cudahy Library First Floor

Presented by Nafisa Ali, Alexa Agra

Supported by Geoff Swindells, Cudahy Library

The objective of our project was to redesign the first floor of the Cudahy library to fit student needs and maximize the area as efficient as possible. By using the 2k factorial design method, we were able to come to a conclusion as to what the library needed to have a comfortable study environment. Through taking multiple surveys, each factor was examined and narrowed down to two things that should be implemented in the library.

MUNDELEIN 308

Exploring Community Partnerships and Strengthening Local Engagement in School Gardens

Presented by Katherine Poett; Community Research Fellowship

Supported by Dr. Tania M. Schusler, Institute for Environmental Sustainability; John Cawood, Openlands

Collaborating with Openlands and McPherson Elementary School, I assessed the involvement of environmental education in school gardens and explored potential partnerships to expand community engagement with the garden spaces. Openlands enables local engagement in conservation stewardship through educational programs, including at McPherson, a Level 1 school in the Ravenswood neighborhood with a 74% Hispanic student body. Through thematic analysis of qualitative data collected from interviews with McPherson teachers, staff, and parents, as well as participant observation of Openlands field-trips and teacher trainings, I documented benefits and challenges of garden-based education, along with opportunities to expand overall community engagement.

40 Days in the Desert: A Lenten Journey and Guide to Living “Zero-Waste” at Loyola

Presented by Sarah Miklius; Joan and Bill Hank Center for the Catholic Intellectual Heritage (CCIH) Research Fellowship

Supported by Dr. Michael Murphy, Catholic Studies

This project follows my Lenten experience of living zero-waste for 40 days, including a step by step guide for other students, staff, and faculty at Loyola to follow as well. From buying food in bulk, to composting. From making my own cosmetic products, to bringing my own containers to restaurants and grocery stores. I have tracked prices, store locations, tips, and tricks on eliminating waste, while living and studying at Loyola. My goal in creating this guide is not only to help myself continue to live sustainably, but also to provide resources for others in this community to do the same.

Man Into Woman Digitization Project

Presented by Zanabe Othman, Anna Mc Cue, Tatjana Willms-Jones; Provost Fellowship

Supported by Dr. Pamela L. Caughie, English; Rebecca Parker; Emily Datskou

This project tells the story of Lili Elbe, the first person to undergo a documented male-to-female gender transition. We have collected both primary and secondary sources, including novels based on Lili’s life, handwritten letters, and published articles. We are working on the Danish, German, American, and British versions of “Man Into Woman,” published in the 1930’s. The project goal is to publish the documents on a website which will allow others to access the original and translated documents easily. We hope to educate others on transgender studies and issues, and encourage them to take an interest in learning more.

MUNDELEIN 403

“The Lives of Others”: Synthesizing Stasi Fact and Fiction to Heal Post-East Germany

Presented by Alexandra Bakalich
Supported by Dr. Reinhard Andress, Modern Languages & Literatures

Since its inception, the German film industry has addressed questions regarding the country's difficult history. Released in the early 2000s, Donnersmarck's "The Lives of Others" deals with the innately German experience of the Stasi, East Germany's repressive secret police. Although it has plot elements rooted in the history of the German Democratic Republic, it relies mainly on its cinematography to create the subjectivity that leads the viewer to become emotionally invested in the lives of the characters in a way that pure historical facts cannot, thus helping to come to terms with a difficult chapter in East German history.

Common Volk: Centuries-Old Ideals Within the Contemporary German Far Right

Presented by Norman Frazier
Supported by Dr. Tanya Stabler-Miller, History; Dr. David B. Dennis, History;

Questions around Germany's growing far-right party, Alternative für Deutschland (AfD), ask whether National Socialist values, and the violence which seems to be their corollary, are remerging. This study provides a historical assessment, arguing that while the contemporary crisis signals a resurgent Nazism, the anti-immigrant, anti-EU values of discontent from the AfD and its constituency have longer roots in the nineteenth century.

Fear & (In)Action: The Emotional Manipulation of Dissent in Contemporary National Political Discourse

Presented by Cindy Dang; Provost Fellowship
Supported by Michael Meinhardt, English

Political manipulation of fear in media promotes a dynamic wherein internal emotional reactions overwhelm both internal and external intellectual consideration, thus legitimizing, unleashing and exacerbating an unassailable marginalization mentality.

MUNDELEIN 404

Guns, Violence and Crime: A Look Into Violent Rap Lyrics Over Time.

Presented by Noah Haakenson
Supported by Dr. Marilyn Krogh, Sociology; Professor Linda Tuncay Zayer Department of Marketing.;

I will be presenting on research I have conducted which analyzes violence within rap lyrics from the late 80's to the present. I will be discussing how rap and hip-hop became branded with a violent and criminal imagery and the different types of violence found in the music. I will also be covering why many songs include violence and if rap and hip-hop lyrics have become more or less violent and graphic over the years.

Religion's Influence on Manga

Presented by Tommy Morales

Religion possesses the ability to steer literature towards different ends. Religion possesses the ability to steer literature towards different ends. I will be investigating the influence religion has on literature, specifically: Christianity's impact on Japanese manga and how the origin story and the holy trinity incorporate themselves into manga, alongside other Christian practices and beliefs such as marriage, gender roles, and free will.

Blade Runner and the Fallen Angels

Presented by Petrit Kola
Supported by Lauren O'Connell, Theology

This presentation will be an analysis on the film Blade Runner and the comparison of the story of Roy Batty and the other replicants and how they compare with Biblical stories of the fallen angels.

MUNDELEIN 406

How the Early Identification of Quantum Gases by William Wien Paved the Way to the Quantum Paradigm in Physics

Presented by Noor Azhar
Supported by Dr. Aleksandr Goltsiker, Physics

Wilhelm Wien is one of the most important modern physicists who paved the way for discoveries made by other scientists and was pivotal in the development of quantum mechanics. While Wien was crucial to these discoveries, he was still seen as “out of the mainstream,” and thus his research was not initially reputed. This research not only looks at the achievements of Wilhelm Wien but also looks at the way new ideas are received in the scientific community.

The Effects of Randomizing Knots and Searching for Nontrivial Knots with Trivial Jones Polynomials

Presented by Andrew Ducharme

Supported by Dr. Emily Peters, Mathematics

By studying knot theory, a subfield of topology, we can find surprising applications in biology and quantum mechanics. Unlike everyday knots, the shapes we study are closed, but otherwise quite similar. To tell various knots apart, we can use an invariant called the Jones polynomial. It is unknown if a nontrivial knot is prohibited from having the same Jones polynomial as the most basic knot, a loop called the unknot. We randomize complex knots' crossings, study the probability of the unknot appearing from the randomization, and search for complex resultant knots whose Jones polynomial matches the simple unknot's.

Knots and Abstract Algebra

Presented by Elizabeth Jurkash, Ariana Grymski

Supported by Dr. Emily Peters, Mathematics

We explored how knots relate to abstract algebra using Thompson group tree diagrams.

MUNDELEIN 407

"Can the Dead Still Speak?" Institutional Uses of the Venerated Dead in Italy and China

Presented by Mark Neuhengen

Supported by Anne Wingenter, History; Anthony Cardoza, History; Zara Pogossian; Ian Johnson, Beijing Center for Chinese Studies

Based on field work conducted in Rome and Beijing, this project discusses the ways institutions use the bodily remains of the venerated dead. The Catholic Church in Rome uses saint relics to draw believers away from their political and everyday surroundings, while the Chinese government uses venerated remains to draw viewers closer to their political surroundings. This project is the culmination of a year of research as part of the Ricci Scholars Program.

Queer Migrations: (Im)migration, Identity, and Sexuality

Presented by Cristina Nunez; Interdisciplinary Research Fellowship

Supported by Dr. Héctor García Chávez, Latin American and Latino Studies

Modern immigration conversations are sanitized of queerness, multiplicity, and authenticity. This presentation explores the ways gender, sexuality, race, class, and ability shape current immigration discourse by exposing the innate queerness of crossing borders and existing. Using history and pop-culture, this presentation will engage viewers with realities and questions about the future of borders and isolation nation-states.

Lili Elbe Digital Archive

Presented by Anais Turiello, Tina Tichen, Elizabeth Kupchella

Supported by Dr. Pamela L. Caughie, English; Rebecca Parker; Emily Datskou

MUNDELEIN 408

Learning to Play with Numbers: Analysis of the PWN Chaperone Tool

Presented by Joseph Remeika, Daniela Zavala; Community Research Fellowship

Supported by Dr. Patrick Green, Center for Experiential Learning; Ramona Richards, Chicago Children's Museum

The Chicago Children's Museum (CCM) welcomes nearly 30,000 students and chaperones through field trips each year. Around 25 partner schools are provided teacher-created chaperone tools to help guide discussion and promote critical thinking in exhibit spaces. These schools are part of the Playing with Numbers (PWN) professional development program, a series of

math workshop for K-1 teachers in Chicago. This research aims to assess the impact of the teacher-created “chaperone tool” on the CCM field trip experience and the ways in which the tool alters interactions between adults and children.

Community-Based Research: Exploring Practices of Diversity and Inclusion with Chicago Friends School

Presented by Kaitlyn Sobun, Tim Joseph, Sarah Alharsha, Roman Hreskiv, Lilliana Medina, Lia Tsikretsis
Supported by Dr. Patrick M. Green, Center for Experiential Learning; Susan Haarman, Center for Experiential Learning

As a neighborhood school rooted in Quaker principles, Chicago Friends School seeks to improve its representation of diversity and inclusivity among the students/families that attend the school. This directly relates to developing common purpose and fostering equally shared membership for strong organizations. This research project emerges from the question that the Chicago Friends School Head of School posed: “What are we doing now and what do we need to do to increase diversity/inclusivity?” This project includes three stages: Internal audit of what is currently being done in this area, External audit of what partners are doing (study of what other organizations are doing), Asset map of community to identify partners to support this endeavor.

Demographic Influence on Chicago Public Library Branch Usage

Presented by Erica Byrne
Supported by Dr. Marilyn Krogh, Sociology; Elise Martel Cohen, Sociology

With the introduction of the widespread use of the internet of the past twenty years, the role of the public library has begun to shift away from exclusively being a space to check out books. This data explores how the demographic makeup of the City of Chicago impact the usage of its neighborhood branch libraries. Using a regression model, I looked at how the race, age, income, and language of a neighbor influence circulation and computer sessions.

MUNDELEIN 414

The Role of Tricornered Kinase in Glia During Eye Development of Drosophila melanogaster.

Presented by Mit Patel; Mulcahy Scholars Program, Provost Fellowship
Supported by Dr. Jennifer Jemc Mierisch, Biology

Glia cells have been hypothesized to influence the development of neural pathways between the brain and the photoreceptor neurons. Recent studies of *Drosophila melanogaster* have identified raw as a gene required for glial cell migration from the optic lobe to the eye imaginal disc. Genetic studies demonstrate Raw and Tricornered (Trc) kinase cooperate to regulate dendritic patterning and can physically interact with each other. In order to examine a potential requirement for Trc in glia, flies with reduced trc levels will be generated in order to observe the role of trc in proper glial development.

Empowerment and Parent Mentoring: An Innovative Model to Strengthen Schools and Communities

Presented by Michelle Sharpe; Carroll and Adelaide Johnson Scholarship
Supported by Amy Krings, School of Social Work; Maria Vidal de Haymes, School of Social Work;

This presentation provides a summary of the findings from an evaluation of the Chicago-based Parent Mentor Program (PMP), a partnership between the Southwest Organizing Project (SWOP) and the Logan Square Neighborhood Association (LSNA). The Parent Mentor Program is designed to reach low-income immigrant parents with the goal of promoting stronger parent-school-community relationships through a context-specific and process-oriented model of community-based leadership development. Provided will be an analysis of the processes through which program participants, who are predominately Latina mothers with children who attend public schools, built new capacities (i.e., leadership, empowerment, civic engagement, activism) and took on new roles within schools, their communities, and the greater educational policy arena.

Inducing Bacteriophage From the FUM

Presented by Taylor Miller-Ensminger; Carbon Undergraduate Research Fellowship
Supported by Dr. Catherine Putonti, Bioinformatics

Until about 10 years the urinary microbiome was thought to be sterile. This belief was debunked when a small population of bacteria were discovered in clinical urinary isolates. Bacteria often harbor bacteriophage (viruses that infect bacteria). This project focuses on inducing and characterizing phage found in *E. coli* from the female urinary microbiome (FUM).

MUNDELEIN 415

The Cyberspace Race: A Contest to Win Global Digital Dominance

Presented by Paul Witry

Cyberspace and the digital world are quickly establishing themselves as realm where new technologies and threats continue to evolve. This research takes a speculator stance, taking into consideration the types of weapons and threats that have shown themselves over the past decades. With these events and tools in mind, three possible scenarios are proposed for how the global digital landscape will establish itself over the next decade and ultimately shape the face of international conflict.

Inigo Communications

Presented by Natalie Sizelove, Joshua Shaffer, Johnathan Folino, Emily Robertson, Georgia Evans, Jaime Gentges, Jill Berndtson, Anna Rossa

Supported by Cheryl McPhilimy, School of Communications; Edelman and Golin

Inigo Communications is Chicago and Loyola's first and only student-run communications agency. Inigo is powered by students at Loyola's School of Communication and is mentored by Golin and Edelman. We work with real clients to produce real results. In the past year, Inigo members have worked with six different clients across multiple industries, creating an array of deliverables. From website design, media relations, video production and social media work, we have worked to increase brand awareness and engagement with our clients' brands. In this presentation, we will be overviews the different types of work done during the 2018-2019 school year.

Pollution (Danger and Purity)

Presented by Audrey Mougolo

Supported by Dr. Meghan Dougherty, School of Communication;

The project will rely in Mary Douglas's book of Purity and Danger. Older anthropologists used the term primitive culture in order to characterize the features of the lack of a written language, isolation, small population, simple social institutions and technological practices, and slow rate of sociocultural changes.

MUNDELEIN 503

Lili Elbe Digital Archive

Presented by Jackie Alfarah, Katie Griggs, Wagne Ravindran, Adeline Azungue

Supported by Dr. Pamela L. Caughie, English; Rebecca Parker; Emily Datskou

The life and transition of Lili Elbe in digital archive.

The Lili Elbe Digital Archive

Presented by Aliana Capati, Sophie Karrow, Audrey McCann, Katherine Schoen

Supported by Dr. Pamela L. Caughie, English; Rebecca Parker; Emily Datskou

Students will study transgender literature and history of the early 20th century and will assist in producing a digital scholarly edition and archive of one such narrative: Man into Woman, the life narrative of Lili Elbe. We will presenting our progress thus far on the project.

The Lili Elbe Digital Archive

Presented by Samantha Riker, Kate Barrett-Murphy, Bennett Miller

Supported by Dr. Pamela L. Caughie, English; Rebecca Parker; Emily Datskou

MUNDELEIN 504

The Lili Elbe Digital Archive

Presented by Eleni Pamboukis, Schola Iradukunda, Cristiana Bertola, Kat Klimek

Supported by Dr. Pamela L. Caughie, English; Rebecca Parker; Emily Datskou

Lili Elbe Digital Archive

Presented by Amanda Lopez, Elle Bromer, Joaquin Davalos Ponce

Supported by Dr. Pamela L. Caughie, English; Rebecca Parker; Emily Datskou

The mission of this archive is cultural preservation and access. We want to preserve an important work in transgender history and the history of modernist literature and culture; and to provide the widest possible access to the narrative in its various versions as well as to supplemental materials housed in archives in Scandinavia.

The Lili Elbe Digital Archive

Presented by Danica Pedregosa, Jade Steele, Ran Zhang

Supported by Dr. Pamela L. Caughie, English; Rebecca Parker; Emily Datskou

Our presentation focused on transcribing the “Vice Versa” issues from the French magazine “Voilà” from the 1930’s. These magazine articles focused on Andreas Sparre’s transformation into Lili Elbe.

RESEARCH POSTER PRESENTATIONS: SESSION 2

2:30 PM - 4:00 PM

♦Poster 1♦

The Effect of Music on Exercise Performance

Presented by Cassandra Cisneros

Supported by Michelle Manrique-Fleming, Exercise Science

The purpose of this study is to identify relationships between exercise performance and changes in music tempo. A correlation between shorter run times and fast tempo music was investigated, as was a correlation between a lower rate of R.P.E. (Rate of Perceived Exertion) and a slow tempo playlist. The results of this analysis can be used to determine whether athletes should listen to music as they exercise and at which tempo would they benefit most.

♦Poster 2♦

Eating Patterns among College Students: The Influence of Eating Pathology and Living Arrangements

Presented by Alexandra Reifenberg; Provost Fellowship

Supported by Laura Nicholson; Amy Heard Egbert; Dr. Amy Bohnert, Psychology

Researchers have proposed that structured settings promote healthful behavior practices in youth, including consistent eating patterns (Brazendale et al., 2017). Since college has been identified as a risky period for weight gain (Holm-Denoma, Joiner, Vohs, & Heatherton, 2008) and eating disorder pathology (Delinsky, Wilson, 2008), examining eating patterns as they naturally occur may enhance understanding of these risks. In particular, the unstructured nature of college may be associated with inconsistent eating patterns. Little work, however, has investigated this as well as associations between eating occurrences (frequency and consistency), BMI, and eating pathology across the week.

♦Poster 3♦

*Determining the Optimal Water Quality for Culturing *Pomacea Paludosa* in a Laboratory Setting*

Presented by Paul Hitch; Provost Fellowship

Supported by Dr. Tham Hoang, Institute of Environmental Sustainability

A number of studies have been conducted with *P. paludosa* to understand its life cycle, including growth, development, reproduction, and the ecological importance of its presence in the natural ecosystem, as well as its sensitivity to environmental contaminants. This sensitivity allows them to be used in toxicology research. To be considered a model organism for aquatic toxicology research and testing, a laboratory culture method should be developed. This study sought to determine favorable conditions such as water quality for growth and breeding of the snail within a laboratory setting by culturing the snails in different qualities of water.

♦Poster 4♦

Molecular Dynamics of Surfactant Interactions with Metal Ions Binding Through Calprotectin

Presented by Arsalan Kamran; Mulcahy Scholars Program

Supported by Dr. Kenneth Olsen, Chemistry and Biochemistry

In the recent development of drugs in the pharmaceutical industry, there has been scientific advances to find the correlation between calprotectin and metal ions. Understanding this relationship helps scientists further investigate human illnesses such as inflammatory bowel disease and staphylococcus aureus. As a result, our research is centered on analyzing surfactants and how they bind. Through the use of molecular dynamics, we can create simulations and can mimic the binding of these specific surfactants. As a result, we can compute and analyze how these molecules will react in the human body

♦Poster 5♦

Influence of Rossby Wave Breaking on Ozone Variation in the Upper Troposphere and Lower Stratosphere

Presented by Megan Barrera

Supported by Ping Jing, Institute of Environmental Sustainability; Swarnali Banerjee, Mathematics and Statistics

Past studies have shown the significant contributions of stratospheric to tropospheric ozone budgets, especially in the mountainous western U.S. Rossby wave breaking (RWB) activities in the upper troposphere and lower stratosphere (UTLS) often result in the stratosphere-troposphere exchange of ozone. This study investigates the influence of RWB on ozone variations within the

UTLS over two U.S. sites between 300 K and 380 K isentropic surfaces from 1985 to 2015. The study sites, Boulder, Colorado, and Wallops Island, Virginia, provide a comparison of the dynamical controls on ozone variations between the western and eastern continental U.S.

◆Poster 6◆

Advertising and Ethics: Theme Segmentation and Community Segregation on Chicago's Rapid Transit System

Presented by Ava Francesca Battocchio

Supported by Dr. Pamela K. Morris, School of Communications

Home to the second largest public transportation system in the United States, Chicago has a long history with economic and racial disparities amongst its 77 neighborhoods. Using mixed methods research involving quantitative and qualitative analysis, this study examines content themes and their prevalence on station platforms within Chicago's rapid transit rail system. By identifying themes in terms of expressed values and cost, in addition to categorizing platforms and lines by their community demographics such as race, income, and education, this study aims to examine theme variance within the context of residential segregation.

◆Poster 7◆

Assessing the Impact of Advertising on Women

Presented by Nataliya Turchmanovych; Provost Fellowship

Supported by Dr. Amy Bohnert, Psychology; Amy Heard, Clinical Psychology

Exposure to unhealthy food advertisements is associated with negative outcomes such as obesity. Although advertising plays a role in persuading consumers to buy certain products, it is unclear which commercials elicit the most emotion and what messages those commercials use to sell the product. Therefore, this study examines the valence (i.e., likeability), arousal (i.e., emotion evoked), and popular themes of 10 unhealthy food commercials advertised to young women. Participants included 354 women ages 18 to 25. Results indicated that commercials associated with high levels of valence and arousal included themes such as taste of food (n=5), sex/beauty (n=3), happiness/pleasure (n=3).

◆Poster 8◆

Unfolding of Proteins Via Chemical Denaturants

Presented by Madeline Sheahan; Interdisciplinary Neuroscience Fellowship

Supported by Ken Olsen, Chemistry and Biochemistry

The purpose of this research is to gain a further understanding of the biochemical mechanisms involved in the denaturation of a small protein using various excess concentrations of chemical denaturant sodium dodecyl sulfate (SDS). This will be accomplished by utilizing a visual molecular dynamics (VMD) program to virtually simulate the denaturations. In the simulation, a single protein will be submerged in a neutrally charged water box and an excess concentration of SDS will be introduced. Each simulation will be left to run for one microsecond at a constant temperature and pressure, and results will be calculated using CHARMM 36 parameters.

◆Poster 9◆

Assessing Techniques for Reincorporation of Contaminated Biodiesel from Waste Water using Gas Chromatography

Presented by Megan McCawley; Mulcahy Scholars Program, Provost Fellowship

Supported by Zach Waickman, Institute of Environmental Sustainability

One of the waste products from biodiesel production comes from a process known as "washing", where water is sprayed on top of the biodiesel and settles to the bottom removing contaminants. Once the water is drained off the biodiesel, it is treated with phosphoric acid to break apart potassium salts, which then releases leftover biodiesel. The goal of my research is to find a way to reincorporate the biodiesel into production to reduce overall waste. Gas chromatography will be used to profile the biodiesel and then a series of experiments will assess various treatment methods.

◆Poster 10◆

Flex Lab Noise Minimization Project

Presented by Lorenzo Trentini, Ana Eyerman, William Rodriguez, Natasha Nakhasi

Supported by Dr. Gail Baura, Engineering Science; Dr. Brook Abegaz, Dr. Chad Johnston

The Flex Lab is a large space consisting of two study lounges located between three teaching labs. Each lab is separated by hanging mobile felt panels designed to minimize the sound between them. Unfortunately, the panels have not proven effective

in reducing noise levels given that they are full of holes. The noise from one area disrupts sessions occurring in other areas. The goal of our design project was to reduce the sound levels that traverse the hanging panels into the different labs. We will present our solution to this issue as well as the means by which we came up with it.

♦Poster 11♦

Spatial Hearing with Precedence Effect

Presented by Harika Patel, Maggie Gast, Brad Giannini

Supported by Dr. Toby Dye, Psychology

Our research project focuses on the selective binaural hearing concerning the precedence effect using interaural level and time differences. There were separate experiments carried out with a total of eight participants for this research. We ran experiments through MATLAB using artificial sources and echo clicks. Each trial consisted of two intervals. During the first interval, a diotic pulse was presented to mark the intracranial midline. During the second interval, two dichotic Gaussian pulses were presented with a binaural cue (ITD or ILD). Participants were always instructed to respond according to the laterality of the second pulse (echo) in interval two.

♦Poster 12♦

Image Processing Algorithms for Automating Pharmacy Procedures

Presented by Jacob Kueber, Daniel Zambrano Garzon, Brian Reynolds, Anthony Camano Enriquez

Supported by Dr. Jason Streeter, Engineering Science; Mark Hoffmann; Mladen Milesic; Kenneth Ingram

Our project is generating software for a machine that automates packaging processes for the pharmaceutical industry. In particular, the machine will help pharmacists optimize their workflow. The machine uses three image processing components to identify, sort, and package pills. We have implemented contour-finding, blob-detection, histogram-comparison, and image capture methods to be used in these components. We have tested these methods and verified that our software is compatible with the machine. Our work will result in a lower production cost, higher gross margin, and a unified coherent system.

♦Poster 13♦

Servants to Leaders

Presented by Jaia Idelle Goan, Gabby Kuderski, Ana Mendoza

Supported by Lisa Combs, Student Diversity & Multicultural Affairs; Devon Lovell, Family Matters

Through our service with Family Matters, STARS Lead strives to teach kids about identity and emphasize the identities they hold. Our position as first-generation students and students of color helps us to do just this. We strive to be servants to the children of Family Matters in order to guide them in the discovery of themselves. As a result, us being servants first guides us in our path to being leaders while also fostering the children's ability to be servants and thus leaders.

♦Poster 14♦

Social Change Model on Leadership

Presented by Imani Melendez, Victoria Harris, Chloe Johnson

Supported by Lisa Combs; Family Matters

The Social Change Model implements the idea of leadership which improves communities in a cooperative way. The Social Change Model is significant because it demonstrates the power of thinking for a community rather than thinking for individual gain. The significance of the Social Change Model to STARS Lead's work with the children from Family Matters is the understanding that our roles as leaders to these children are more than just titles, but a process of working towards creating a positive change in their lives, big or small, during every volunteer session.

♦Poster 15♦

Optimizing Trapping Methods to Control Invasive Red Swamp Crayfish in the Chicago Region

Presented by Colette Copic

Supported by Dr. Reuben Keller; Erin O'Shaughnessey; Rachel Egly, Institute of Environmental Sustainability

Recent crayfish invasions have exposed the lack of proven methods for eradicating populations and preventing spread. We have identified an isolated population of the invasive red swamp crayfish (*Procambarus clarkii*) in the Chicago River (Illinois, USA) that could spread into Lake Michigan and other Laurentian Great Lakes. We report on experiments to determine the approach that yields highest catch per unit effort (CPUE; number of crayfish captured per trap cleared). These results show that simple changes to trapping programs can increase CPUE and hopefully lead to more effective control of invasive crayfishes.

♦Poster 16♦

Implications of Athletics and Dance: The Effects of Movement on Creativity and Social and Emotional Intelligence

Presented by Demiana Agaiby

Supported by Dr. Elizabeth Wakefield, Psychology

This project focuses on how expertise in a movement-based activity (i.e., dance, athletics) may impact creativity and social and emotional intelligence. Dancers, athletes, and those in the general population completed surveys to assess these non-cognitive skills. We predict that expertise in artistic and athletic fields will contribute to higher scores of creative problem solving and social and emotional intelligence compared to the general population. Additionally, we predict that there will be a distinction in the results of the athletes and artists, based on the premise that the latter requires more artistic capacity than the former.

♦Poster 17♦

How Does the Time since Invasion by Hybrid Cattail Affect the Diversity of a Wetland Seed Bank?

Presented by Maggie O'Brien

Supported by Shane Lishawa, Institute of Environmental Sustainability; Drew Monks, Institute of Environmental Sustainability

In Great Lakes coastal wetlands, invasive species like hybrid cattail (*Typha x glauca*) outcompete native plant species, which fade from the visible plant community. I collected seed cores from Sand Island Marsh in northern Michigan and conducted a seedling emergence study to test the hypothesis that the diversity of species persisting in the seed bank will decrease as time progresses following *Typha* invasion. I determined the diversity of the seed bank and compared these results to an uninvaded wetland. This work will provide information to evaluate which wetlands will exhibit the most resilience to invasive plant removal.

♦Poster 18♦

The Role of Ribbon in Gonad Development and Homeostasis

Presented by Shannon McDonnell; Biology Research Fellows Program

Supported by Dr. Jenifer Mierisch, Biology

Failure to form an organ with proper form and function can lead to birth defects, disease, and even lethality. The gene ribbon (*rib*) has been observed to be critical for proper embryonic gonad development, and also continues to be expressed in the germ cells and somatic cells of the adult gonad (Weyers et al., 2011; Silva et al., 2016).

♦Poster 19♦

Pride, The Root of Evil in Tolkien's Universe

Presented by Daniel Hauser

Supported by Lauren O'Connell, Theology

This paper will explore the role of pride in Tolkien's fantasy, and argue how it is the source of all discord and strife within middle earth and beyond.

♦Poster 20♦

Beyond the Classroom: Using Supplemental Text Message Formative Assessment in Introductory Chemistry

Presented by Elizabeth Stumpe, Madison Smith; Mulcahy Scholars Program

Supported by Dr. Patrick Daubenmire, Chemistry & Biochemistry

The objective of this study is to explore the ways that outside exposure to chemistry content can influence a student's performance in a general chemistry class. This project involves formative assessment, in which students are able to develop their competencies in material throughout their time in the course. Through this modality, the impact of providing supplemental questions can be compared to students' progress in the class by tracking the accuracy, response rate, and confidence in their answers. Data analysis relating these parameters with students' course grades lends insight to how supplemental work and formative assessments impact understanding of chemistry material.

♦Poster 21♦

Waste Management and Local Perspectives Concerning Trash and the Environment

Presented by Lauren Neher

This project looked to investigate how trash is managed and what people think of waste and litter along a 10 kilometer stretch of the Iquitos-Nauta Road in northwestern Peru. Myself and a partner also collected a weeks worth of trash from 20 families living along the road and sorted through each bag to collect data on what people in the area formally throw away.

◆Poster 22◆

Links between Parent's Depressive Symptoms, Parenting Styles, and Child Behavior in Immigrant Families with Preschool-Aged Children

Presented by Jasmine Shughoury

Supported by Dr. Li-Grining, Psychology; Zahra Naqi, Psychology

Previous studies have focused on the link between depressive symptoms in parents and children's behavioral problems, but relatively few studies have focused on immigrant families with preschool-aged children. This study looks closely at the link between depressive symptoms in such parents and their children's behaviors. Data on parenting styles was also collected to see how it may influence the relationship between depressive symptoms and children's behavior. Results suggest that parents experiencing more depressive symptoms tend to have children with more behavioral problems. Furthermore, parents with positive parenting skills reported children with less behavioral problems.

◆Poster 23◆

Heavy Metal Resistance within Urban Freshwater Pseudomonads

Presented by Laura Maskeri; Mulcahy Scholars Program

Supported by Dr. Catherine Putonti, Bioinformatics

Species of the genus *Pseudomonas* can be naturally found in diverse environments. Its presence within freshwaters, however, is often attributed to storm water or runoff. Recently we conducted a multi-year survey of *Pseudomonas* diversity within the Chicago near-shore waters of Lake Michigan, identifying 11 different species, including isolates of the same species from different locations or dates. This suggests that urban freshwaters may inherently harbor more pseudomonads than more remote freshwater ecosystems. Furthermore, whole genome sequencing of the Lake Michigan pseudomonads revealed the presence of resistance to several heavy metals.

◆Poster 24◆

Non-Suicidal Self-Harm

Presented by Danielle Ament; Provost Fellowship

Supported by Arthur Lurigio, College of Arts and Sciences

The objective of this research is to explore the phenomenon of self-harm. This research aims to identify the factors that lead people to self-harm as well as differences in self-harm based on individual characteristics.

◆Poster 25◆

Quinlan Undergraduate Advising Research

Presented by Kelly Lamb, Mary Schultz, Shelby Noviskis, Maureen O'Brien, Meghan Figel, Saja Abdallah

Supported by Stacy Neier Beran, Marketing

The Quinlan Undergraduate Advising office was in need of marketing research in order to enhance their communication with students. This enabled them to understand students' different needs, to determine pain points in current communication, to investigate students concerns, and to determine how to best connect with the students to receive feedback.

◆Poster 26◆

Team Genie: Undergraduate Advising

Presented by Erin Lippert, Sakina Hussain, Tiara Wallace, Anita Paul, Ching Chi Ip, Madhura Rajasingham;

Supported by Stacy Neier Beran, Marketing

Composed of 6 Quinlan students, Team Genie is presenting a market research project focused on Quinlan's Undergraduate Advising.

◆Poster 27◆

MedinMotion Biotechnology

Presented by Mark Kelner

Supported by Dr. Joe Milanovich, Biology

My presentation will focus on my work with medical technology related to topical application of new solutions for skin/mucosal healing, a redesigned suture, and patent work.

♦Poster 28♦

Jesuit Values in Action – Serving Loyola Community Adults for 27 Years. The Loyola Community Literacy Center

Presented by Karolina Magnuszewska, Aisha Craig, Ella Xistris

Supported by Jacqueline Heckman, English

The Loyola Community Literacy Center offers free tutoring in a welcoming, supportive environment for local adults. Our learners are immigrants, refugees, and native speakers who are learning English or improving literacy skills. Loyola students serve as tutors and staff, and tutors can earn credit in English 393 or Honors 290 for their service. In its 27th year, the Literacy Center is a project of the Department of English and the College of Arts and Sciences and supported by The Paul Glassco Endowment. Located in Loyola Hall, the Center is open for tutoring Monday -Thursday evenings, fall and spring semesters.

♦Poster 29♦

Team Groovy Guy: TopBox Foods Deliverables

Presented by Forrest Christian, Edward Allegretti, Ryan Doede, Abigail Gerada, Vivien Gere, Jacob Meline;

Supported by Dr. Stacy Beran-Neier, Marketing; Jason Billbrey, TopBox Foods

Team Groovy Guy of Stacy Neier's Marketing Research class has had the opportunity to do research for Top Box Foods. We saw from our first interview with Top Box Foods is that their issue is positioning. Our research objectives hinged upon the special care that Top Box Foods brings as a non-profit. With so many different grocers out there, Top Box Foods needed more information on how it could distinguish itself in the eyes of the consumer. We ran and analyzed surveys, focus groups and in-depth interviews and came to our results based on hard work, empathy and curiosity.

♦Poster 30♦

Estimating Chicago Waterbodies at Highest Risk for Introduction of Invasive Red Swamp Crayfish Based on Proximity to Vectors of Introduction

Presented by Eve Hemingway

Supported by Reuben Keller, Institute of Environmental Sustainability; Rachel Egry, Institute of Environmental Sustainability; Erin O'Shaughnessey, Institute of Environmental Sustainability

At least 25 U.S. states and 13 Canadian provinces have reported one or more ecological problems associated with the introduction of invasive crayfish. Despite the rising threat of invasive crayfish across North American habitats, little is known about their vectors of introduction. Within the Midwest region, the *Procambarus clarkii* has been identified as an invasive species within a range of watersheds and river systems, including the Chicago region. Despite this, human-induced vectors of introduction remain unreported. This study identifies the vectors of *P. clarkii* introduction within Cook County, IL and assesses the risk of their introduction across inland lentic bodies.

♦Poster 31♦

School Climate and Self-Esteem as Mediating Factors for Academic Achievement in the Context of a Cross-Age Peer Mentoring Program

Presented by Annika Pentikainen; Provost Fellowship

Supported by Maryse Richards, Psychology; Catherine Dusing, Psychology

Participants from high-risk Chicago neighborhoods were recruited to participate in a cross-age peer mentoring program. The current project seeks to understand the impact of program attendance on academic achievement via increased self-esteem and school sense of community. A mixed-methods analysis utilized quantitative survey data and qualitative data from a series of focus groups. Preliminary quantitative analysis did not show any significant effects of the program, but preliminary qualitative analysis indicated common themes of increased patience, professionalism, and interpersonal skills following participation in the mentoring program. These reports indicate a need to further explore the potential effects of such a program.

♦Poster 32♦

Arañas de Peru

Presented by Gabriella Rodriguez, Jana Richter, Ana Milian

Supported by Stephen Mitten; Inkaterra

Citizen science is a vital aspect of conservation in the Amazon Rainforest. Throughout the course of seven days in the Madre de Dios Region in Peru, observational data was collected on numerous arachnid species. Research was conducted on species char-

acteristics and common adaptations these Amazonian arachnids take to survive in daytime and nighttime habitats. From this, a detailed inventory was compiled.

♦Poster 33♦

Influence of Fungicide and Nutrient Additions on Water Quality and Biofilms in a Mesocosm Setting

Presented by Courtney Carmack; Mulcahy Scholars Program

Supported by Dr. Joseph Milanovich; Dr. Martin Berg; Michael Vosburgh, Biology

We used data from field surveys to replicate two concentrations of Azoxystrobin, nitrogen, phosphorus, and N+P and examined water quality variables and algal concentrations from May to August 2018. We found these chemical inputs did not have a measurable influence on several water quality variables or concentrations of algae (measured by chlorophyll a and phycocyanin). These data suggest chemical inputs into these systems may not hinder the quality of habitat that golf course lentic systems are providing, and data similar to this could lead to a greater understanding of the contributions these courses provide to biodiversity in urban areas.

♦Poster 34♦

Survey and Identification of Amazonian Palms

Presented by Felicia Marsiglio, Megan Tomerlin

Supported by Stephen Mitten SJ, Institute of Environmental Sustainability; Jan Brack, Palmetum, Inkaterra Association; Fernando Roca, Pontifical Catholic University of Peru

Amazonian palms were surveyed in the Tambopata province of Peru, and a dichotomous key of 23 native species was written based on this research. Photos of various species of palms were submitted to iNaturalist, a citizen science application for monitoring and identification. This research was conducted in collaboration with Inkaterra Association, a non-profit conservation organization. Biodiversity monitoring and citizen science are increasingly important, and this research contributes to the work of Inkaterra Association and the Loyola Institute of Environmental Sustainability in these fields.

♦Poster 35♦

Stars and Cups and Fingers, Oh My!

Presented by Olivia Sterling, Emma Congdon, Taylor Schneider

Supported by Steven Mitten, SJ; Brian Ohsowski, Biology

Fungi was surveyed in the Madre de Dios region of Peru. 25 species were found. In addition Earth Stars, Wine Cups, and Dead Man's Fingers were examined for precise locations and substrate materials. Photo identification was entered into citizen science site iNaturalist aiding in the conservation efforts by Inkaterra Guides Field Station.

♦Poster 36♦

Phenotypic Investigation of Two Plasmodium Lines Lacking TRXL-1 and SAXO1

Presented by Chase Gauthier; Biology Research Fellows Program

Supported by Dr. Stefan Kanzok, Biology; Griffin Berge, Biology

To survive the passage through the mosquito, the malaria parasite develops into a motile form called an ookinete. This shape is generated and maintained by cytoskeletal elements, primarily microtubules. Only few of the microtubule associated proteins (MAPs) have been identified in the malaria parasite. We have identified two genes in the malaria parasite, thioredoxin-like protein-1 (TrxL-1) and SAXO-1. Adapting the CRISPR Cas9 system *Plasmodium berghei* (*P. berghei*), we have successfully disrupted each gene. TrxL-1KO parasite exhibit a significant delay in ookinete maturation, with some ookinetes exhibiting severe morphological deformations. The analysis of the SAXO-1KO are currently in the initial stages.

♦Poster 37♦

Great Lakes Preservation Among College Students

Presented by Ali Gornbein

Supported by Dr. Pamela Morris, School of Communication

The research topic was finding out the overall attitude about the preservation of the Great Lakes among college students as well as if actions were being taken towards protecting them. The research method was a quantitative survey of 40 students. To determine the overall knowledge, opinions, and attitudes of college students on preserving the Great Lakes, results were analyzed and recorded and appropriate statistical methods were applied. The survey results indicate that college students are generally

not taking action towards preserving the Great Lakes. This research provides a foundation for policy communications as improving the Great Lakes demands innovation and is essential to the health of the ecosystems.

♦Poster 38♦

Healthy Mom's, Healthy Kids

Presented by Andrea Moreno, Kevin Williams

Healthy Moms, Healthy Kids is a collaborative pilot program with the Housing Opportunities for Women (HOW) and Chicago Department of Public Health (CDPH). The partnership looks to maximize health care coordination for pregnant and newer mothers who have experienced or are at-risk for homelessness. The role of the Center for Urban Research and Learning (CURL) is to review the program to determine if the mothers benefit and evaluate its success. We conducted research by giving surveys to the mothers, taking observational notes during the case manager and nurse meetings, and conducting focus groups with the mothers, case managers, and nurses.

♦Poster 39♦

Family Court Enhancement Project

Presented by Loren McCauley; Center for Urban Research and Learning (CURL) Fellowship

Supported by Dr. Christine George, Center for Urban Research and Learning; Cook County Court System

In cases of domestic violence where shared children are involved, civil orders of protection are obtained through the Domestic Violence Court within the Cook County Court system. The purpose of the Family Court Enhancement Project is to insure that orders of protection are safe for the survivor and the child(ren) and address appropriate and safe parenting needs of the child (ren) regarding issues such as the custody and visitation. The Center for Urban Research and Learning (CURL) examined the outcomes of cases which were granted Emergency Orders of Protection, as well as Plenary Orders of Protection.

♦Poster 40♦

Jane Addams Senior Caucus NO ACCESS Campaign – Isabelle Abbott

Presented by Isabelle Abbott; Center for Urban Research and Learning (CURL) Fellowship

The Center for Urban Research and Learning and Jane Addams Senior Caucus are partnering to better understand the challenges of Limited English Proficient (LEP) seniors living in the Chicago Housing Authority (CHA) buildings. For these seniors, understanding CHA policies can be extremely difficult without adequate translation services. There are gaps in the communication regarding vital information between the CHA and residents. How do LEP seniors living in CHA housing experience accessing services? Do these experiences align with current CHA policies? This research uses a collaborative community-university approach, aligning engaged research and community organizing to create change.

♦Poster 41♦

Optimizing Simulations of Shaken Granular Media

Presented by Anirrudh Krishnan; Mulcahy Scholars Program

Supported by Dr. Jon Bougie, Physics

We use a modified version of the Navier-Stokes equations to apply methods from fluid dynamics to study the behavior of grains. We are applying these equations to study the relationship between shocks and patterns in shaken granular layers. Due to the complexity of the equations, we use a computer simulation to numerically solve them. The simulation is computationally intensive, so we are utilizing distributed computing methods to optimize the simulation, resulting in a much more rapid data acquisition process.

♦Poster 42♦

The Associations between the Presence of Caring Adults, Internalizing Symptoms, and Externalizing Behaviors in Serious Adolescent Offenders

Presented by Mary Yarney

Supported by Jenny Phan; Noni Gaylord-Harden, Faculty Mentor

There is an overrepresentation of violence-exposed youth with mental health problems in the juvenile justice system (Graves, Frabutt, & Shelton, 2007). Further, for youth involved in the juvenile justice system, internalizing symptoms may impact their externalizing behaviors (Graves et al., 2007). Recent evidence suggests that relationships with committed, caring adults in ado-

lescents' lives within these high-risk contexts may be important assets for protecting against negative outcomes (Bowers et al., 2014). The current study will examine associations among exposure to community violence, presence of caring adults, and internalizing symptoms and externalizing behaviors in a sample of serious juvenile offenders.

♦Poster 43♦

Influence of Plastics on Triclosan Transformation in Environment

Presented by Grace Bell

Supported by Dr. Chiarelli, Chemistry; Xiolmara Martinez, Chemistry

We studied how the accumulation of plastics influence the stability of triclosan in aqueous environment. Triclosan is an antimicrobial agent present in many personal care products available to consumers and is a common pollutant. We studied the rates at which triclosan transformed into its byproduct 2,8-dichlorodibenzo-p-dioxin (DCDD) when exposed to UV Radiation and how different plastics interact with the rates of transformation.

♦Poster 44♦

Archdiocese of Chicago Anti Violence Initiative

Presented by Trevaughn Latimer; Center for Urban Environmental Research and Policy (CUERP) Undergraduate Research Fellows Program, Center for Urban Research and Learning (CURL) Fellowship

Supported by Teresa Neumann Center for Urban Research and Learning; Center for Urban Research and Learning

In partnership with the Archdiocese of Chicago (AOC) and Loyola's Center for Urban Research and Learning (CURL), this is a mapping project that seeks to identify both where violent crimes happen in Chicago and where AOC resources are located across the city. The AOC has started a Violence Prevention Initiative and has asked CURL for guidance in prioritizing their efforts. Locating where AOC resources and violent crimes overlap in the city will better inform the AOC of their existing resources and where they can have the most impact.

♦Poster 45♦

Microfibers: A Lethal Ingestion

Presented by Dalila Ovalle, Michael O'Keefe, Cassandra Slattery

Supported by Dr. Timothy Hoellein, Biology; Dr. Tania Schusler, Institute of Environmental Sustainability

Microfibers are small plastic strands that make up synthetic fiber clothing. When washed, these materials release microscopic plastic strands into aquatic habitats, inflicting damage on the digestive tracts of aquatic organisms. In order to find solutions to this problem, we are testing potential filters against standard washing methods and then analyzing effluent samples to see if the filter use alters fiber count. If the filter reduces microfibers, we will support its implementation. If the filter is ineffective, the presence of microfibers alone is evidence that microfiber pollution is a pressing issue that must be addressed on local and global scales.

♦Poster 46♦

UGA Marketing Research Findings

Presented by Will LeRoux, Christopher Trinkus, Luke Cianciolo, Damien Dembecki, Abby Beck, Conner Baker, Tom Giannola

Supported by Steven Hornick, Jess Ciesielski

We will present a poster of our marketing research for Undergraduate Admissions of Loyola University Chicago. Using the tools and research skills taught to us in our Marketing course, we conducted research to help improve their business and achieve their goals. Given the company's business issues and marketing information we created research objectives to help solve the company's issues.

♦Poster 47♦

How Does "The Chronicles Of Narnia: The Lion, The Witch, and The Wardrobe" Associated with Christian Faith and Religion

Presented by Stavroula Kontoravdi-Kontou

Supported by Dr. Lauren O'Connell, Theology

The study explored some of the religious symbolisms and the association of Narnia's world with religion. The study answered the research question: How does "The Chronicles of Narnia: The Lion, The Witch, and The Wardrobe" associated with Christian faith and religion. The study argued and proved the association of the story with religion by looking at the hidden religion symbolisms of C.S Lewis' book.

◆Poster 48◆

Preclinical Testing of PIM Kinase Inhibitor as Therapy for Prostate Cancer

Presented by Mohammed Siddiqui

Supported by Dr. Joseph Milanovich, Biology; Dr. Sarki Abdulkadir, Northwestern Feinberg School of Medicine; Dr. Vinay Sagar, Lurie Research Center

The research has not been completed yet due to which an abstract has not yet been prepared.

◆Poster 49◆

Exploring Business Students' Perception within Undergraduate Student Advising

Presented by Vasu Patel, Steve Madete, Noah Petersen, Rachel Currie, Nikki Rogers, John Caranci

Supported by Stacy Neier Beran, Marketing

In order to provide services that satisfy students' needs, research is needed to assess the current perception of Undergraduate Advising (UGA). As a marketing research group, we used the data from surveys and focus groups to understand students' perception on UGA's services.

◆Poster 50◆

The Expression of the col2a1b gene during Zebrafish Embryogenesis

Presented by Jessie Dupay, Janey Marbella, Samantha Miller; Mulcahy Scholars Program

Supported by Dr. Rodney Dale, Biology

We will identify genetic expression of the col2a1b gene, a Type II collagen, in zebrafish. Because col2a1a and col2a1b are paralogous, information from previous col2a1a research can be used to locate expression and regulatory elements in col2a1b. A Type II Collagen protein initiates expression in the perichondrium, promoting cartilage development that leads to bone development by chondrocytes. Because col2a1b is more similar to the human gene COL2A1 than col2a1a, our research could prevent congenital defects and diseases, such as osteoarthritis. Through an RNA probe and in situ hybridization, we can map col2a1b expression for the first five days of development.

◆Poster 51◆

Comparative Study of Oboes and Clarinets

Presented by Laura Fitzgerald; Mulcahy Scholars Program

Supported by Dr. Gordon Ramsey, Physics

The oboe and clarinet have such different sounds despite their similarities in size and shape. This study is an exploration of the reasoning behind their differences through a detailed acoustical analysis and geometrical study of these instruments, comparing and contrasting their properties. The oboe and clarinet are comparable in size but have some key differences. The oboe's conical shape allows for all the harmonics to be present, while the clarinet is mostly cylindrical, except for the bell, so that mostly odd harmonics are present. I am exploring what characteristics are most important in the contribution to the difference in sound.

◆Poster 52◆

Denaturation of Small Proteins

Presented by Amita Nguyen; Mulcahy Scholars Program

Supported by Dr. Ken Olsen, Chemistry

The project will be focused on the denaturation of proteins by urea. It will be conducted using computer simulations, where four selected proteins, including 4bir, 3bov, 2vim, and 2yxf, will be set into a water box filled with 8M of urea and run under 500K for 100 ns. By analyzing these simulations, the way of denaturing a protein done by urea will be better understood.

◆Poster 53◆

Gender, Taboo, and Diversity: How Tampon Advertising Has Evolved (1920s to Today)

Presented by Emily Robertson; Carroll and Adelaide Johnson Scholarship, Social Justice Fellowship

Supported by Dr. Jenna Drenten, Marketing

For decades, advertisers have avoided the accurate portrayal of periods, despite menstruation being crucial to humanity. The purpose of this study is to understand how tampon advertisements have shaped cultural norms around periods. Based on a con-

tent analysis of 100 print and commercial tampon ads in the United States from the 1920s to today, three key themes emerged: gender stereotyping, lack of diversity, and reinforcing taboos. This research suggests tampon advertising has historically misrepresented period blood (e.g., blue ink), emphasized the fabricated ‘joy’ of periods, and belittled periods as a shameful topic, which disregards reproductive health and miseducates consumers.

♦Poster 54♦

REAL: Wind

Presented by Joseph Mazich, Alec Lancaster; Mulcahy Scholars Program
Supported by Dr. Jon Bougie, Physics; Alec Lancaster

The purpose of the Renewable Energy at Loyola: Wind (REAL: Wind) project is to determine the feasibility of installing a windmill on Loyola’s Lakeshore campus. We have written a Python script that allows us to analyze wind speed data that we have been collecting for approximately 2 years from an anemometer placed on the roof of Santa Clara Hall. Currently, we are optimizing the code for better user interfaces and more proficient analytical capabilities. REAL: Wind aligns its goals with Loyola’s Plan 2020 by creating a more environmentally friendly and sustainable campus.

♦Poster 55♦

Iron Deprivation Therapy for Renal Cell Carcinoma: Introductory Findings to Identify a Novel Treatment for Clear Cell Renal Cell Carcinoma

Presented by Peter Fiorica
Supported by Dr. Eric C. Kauffman, Roswell Park Comprehensive Cancer Center

The role of iron in clear cell (cc) renal cell carcinoma (RCC) is poorly characterized; however, the metal’s ability to cause oxidative stress and modulate the VHL/HIF- α axis has introduced questions regarding its role in ccRCC tumorigenesis. While little work has been completed to investigate the function of iron in ccRCC, the current project tested the hypothesis that iron accumulation in ccRCC results from an augmented reliance on iron for survival and proliferation because of desynchronized VHL/HIF- α axis. Our results pose as introductory finding to offer a potential novel treatment for RCC: iron deprivation using iron chelators.

♦Poster 56♦

Religious Tropes in the Throne of Glass Series

Presented by Kacie Barrett
Supported by Lauren O’Connell, Theology

My presentation will look at the ways in which Sarah J. Maas answers various religious questions through her fantasy series, Throne of Glass. The author uses a blend of religious tropes and practices within her secondary world in order to speak truths about the primary world and its religions.

♦Poster 57♦

A Circadian Output Center Controlling Feeding Rhythms in Drosophila

Presented by Madison Martin; Mulcahy Scholars Program, Provost Fellowship
Supported by Dr. Dan Cavanaugh, Biology; Dr. Austin Dreyer, Biology

The circadian system produces ~24-hr rhythms and consists of a core clock in the brain, input pathways, and output pathways. Specific cell populations within the *Drosophila* pars intercerebralis (PI) are part of the output pathway. Here we examine the role of *Drosophila* insulin-like peptide (DILP)- and SIFamide (SIFa)-expressing cells in the PI, which are connected to the central clock and involved in feeding behavior. We find that SIFa cells alter feeding rhythms and behaviors, while DILP cells only affect feeding behaviors. This suggests that circadian control of different behaviors relies on output circuits that access molecularly-distinct PI output populations.

♦Poster 58♦

Threat Perceptions and Behavioral Intentions Towards Transgender Individuals

Presented by Megan Armstrong; Provost Fellowship
Supported by Dr. Robyn Mallett, Psychology; Linas Mitchell, Psychology

In the past decade, transgender visibility and acceptance have increased. However, transphobia and discrimination continues to plague the everyday of lives of transgender individuals in the form of physical violence and threats to their safety. Cottrell and

Neuberg's (2005) sociofunctional approach to prejudice links threat perceptions to a primary emotion, an action tendency and associated motivation. This study aims to utilize this approach to understand how threat perceptions influence the way people intend to behave towards transgender individuals.

♦Poster 59♦

Screening of Novel Antimalarial Therapeutic Compounds in the Malaria Mouse Model System

Presented by Magdalyn Brabec

Supported by Dr. Stefan Kanzok, Biology; Loyola University Chicago Stritch School of Medicine

Artemisinin-combination therapy (ACT) is currently the leading form of malaria treatment. Unfortunately, there has been a growing resistance to artemisinin in the malaria-causing parasite. This developed resistance has resulted in an urgency to develop new treatments for the disease. High-throughput Screening (HTS) of natural compound libraries has uncovered many compounds showing potential antimalarial activity in-vitro. These compounds are now being tested in-vivo. In order to evaluate the efficacy of test compounds, the onset of the disease is tracked based on the mouse's parasitemia, change in body weight, lethargy, paralysis, & survival of the mouse in comparison to an untreated mouse.

♦Poster 60♦

Ex Machina: Blurring the Line between Man, Machine, and God

Presented by Noah Banasiewicz

Supported by Dr. Lauren O'Connell, Theology

An examination of the theological implications of artificial intelligence through the lens of the film Ex Machina.

♦Poster 61♦

Social Identities Impact on Perceptions of Crime & Stance on Crime Policy

Presented by Tim Platten; Provost Fellowship

Supported by Dr. Twyla Blackmond Larnell, Political Science

How to deal with crime is a social problem that has plagued all forms of society throughout history. Integral to understanding crime is understanding its ability to be found amidst communities that are composed of people who identify with any social identity. White, black, woman, man, wealthy, and impoverished people are all exposed to crime within their societies in a variety of ways. Those same people look to their governments to act as mechanisms of lowering crime rates and fostering safer communities on their behalf. Despite crime's ability to supersede all social identities, these identities can still play a vital role in a person's perception of crime, its solutions, and local government's place in implementing those solutions.

♦Poster 62♦

Redox Activity of PhLP3 Conserved in Eukaryotes

Presented by Brendan Sweeney; Biology Summer Research Fellowship, Mulcahy Scholars Program

Supported by Dr. Stefan Kanzok, Biology

Phosducin-like proteins (PhLP) belong to the thioredoxin family and are highly conserved in eukaryotes from yeast to humans. Their cellular roles include G-protein signaling and protein folding. We recently discovered that PhLP-3 of Plasmodium and its human homolog (Txndc9) are redox active. This prompted us to investigate the redox activity in PhLPs of other model organisms. To this end, we purified PhLP-3 of *Drosophila melanogaster*, *Danio rerio*, and *Caenorhabditis elegans*. Our results show in vitro redox activity for each protein in a thioredoxin-coupled assay. This demonstrates not only that DmPhLP-3 and DrPhLP-3 are redox active but that they are potential target proteins for the thioredoxin system in vivo.

♦Poster 63♦

The Most Famous Sinner: Sin, Redemption, and Holy Love in the Politicized Life of Mary Magdalen

Presented by Casey Yacullo

Supported by Dr. Tanya Stabler, History; Dr. Teresa Gross-Diaz, History; Dr. Leslie Dossey, History

An examination into how the different retellings of the life of the saint Mary Magdalen reflected the goals of their authors, and what they reveal of the political and social circumstances of the times in which they were written. The project explores how one woman's life was manipulated and emphasized to convey specific messages during the Late Medieval and early modern periods.

♦Poster 64♦

Infective Endocarditis

Presented by Ayesha Ghumra

Supported by Dr. Muhammad F Masood, Marci Damiano, Eric Rome

Infective endocarditis is a continuing problem in both developing and more developed countries. Despite the available treatments, the rates of mortality have not improved. We analyzed and compared the long term outcomes of aortic valve repair (AVR) with annular patch repair versus AVR no patch repair in infective endocarditis patients at a single institution. By using a Kaplan Meier curve, twenty year survival rates for infective endocarditis patients who underwent either an aortic valve annular patch repair or no patch repair shows that the patients who had an aortic valve no patch repair had better survival.

♦Poster 65♦

Synthesis, Characterization, and Oxidation of Copper (I) Complexes Using N,N,N-Pincer Ligands

Presented by Isabel Garcia; Mulcahy Scholars Program

Supported by Wei Tsung Lee, Chemistry and Biochemistry

D-block metals show great promise in inorganic catalytic research. Particularly, copper, a d-9 metal has contributed to the catalytic properties of pincer complexes. Copper pincer complexes were obtained through attachment of copper (I) metal to tridentate di-pyrazole-3,6-di-tert-butyl-carbazole, a N,N,N-pincer ligand. This ligand changes the metal geometry, affecting its reactivity. We used lithium di-isopropyl amide to deprotonate the N,N,N-pincer ligand and reacted it with copper (I) chloride to obtain the complexes. Upon acquiring nuclear magnetic resonance spectra and X-ray crystal structures, oxidation studies were performed. The findings of this study will help us further understand electron transfer of the copper complexes.

♦Poster 66♦

Spiritual Morality and Sacred Myth in The Game of Thrones

Presented by Ashley Lindsey

Supported by Lauren O'Connell, Theology

This research project will be comparing and contrasting the religious traditions of Western Christianity to the traditions of the several religions in television show The Game of Thrones. The research seeks to show that fantasy can teach people religious morals of good and evil.

♦Poster 67♦

Understanding Speech and Behavior at Misericordia

Presented by Mikayla Davis

Supported by Andrew Miller, Center for Experiential Learning; Rachel Michels, Misericordia Home; Sharon Rosenbloom, COPES Special Needs Services

In the population of adults with developmental disabilities, a combination of speech pathology and behavioral guidance can allow for individuals to communicate effectively and reach their fullest potential. In Misericordia's Personal Effectiveness Program, we recognize the different needs and capabilities of each resident in order to create the best plan of action to promote positive behaviors that reflect their independence. Continuous practice can help with finding ways for residents to communicate their thoughts and feelings at any level of ability.

♦Poster 68♦

Density-Dependence Regulates Resource Availability and Waste in Nature, Implications for Sustainability

Presented by Olivia Niosi, Erin Kilbane, Maddie Demo

Supported by Ray Dybzinski, Institute of Environmental Sustainability

Without intention, nature has sustained the availability of life-supporting essential resources for billions of years, despite the fact that most organisms produce natural wastes that they themselves cannot use. Remarkably, natural wastes are recycled at relevant timescales that prevent them from accumulating indefinitely. Here, we identify the mechanism of negative density-dependence (NDD) and demonstrate that the critical role it is known to play in biological population regulation extends to the sustainable recycling of life's abiotic resources and natural wastes. Incorporating NDD into our economy may be an answer to a more sustainable future that mimics nature.

◆Poster 69◆

Evaluation and Utilization of DNA "Barcodes" to Enhance the Efficacy of Clover Species Identification

Presented by Ereni Kourkouvis, Courtney Van Laten, Mariana Olivencia; Mulcahy Scholars Program
Supported by Dr. Howard Laten, Biology

Careful and correct identification and classification of species are vital to investigators and their studies. For projects such as this related to phenotypic adaptability, evolutionary trajectories, and genomic diversity, there is a substantial dependence put on seed or germplasm repositories to provide correctly identified species so as not to compromise the integrity of the studies. Using over 100 clover accessions, we amplified and sequenced the nuclear ITS, the chloroplast trnL intron, and a commonly amplified region of chloroplast matK to add DNA sequence data to qualities analyzed for species identification and work to resolve the issue of species designation discrepancies.

◆Poster 70◆

Measurement of Synaptic Plasticity via Electrical Stimulation

Presented by Syedah Jafary; Interdisciplinary Research Fellowship
Supported by Dr. Vincent Chen, Engineering Science

Stimulation trains of a pulse, square, and sinusoidal wave with the same stimulation frequency/rate do not generate the same amount of potentiation as observed in earlier studies. This might be due to the fact that the power spectral densities are different between the various stimulation waveforms. That is, the stimulation frequency and the actual power spectral distribution of the signal (including harmonics) in the frequency domain are not identical and cannot be interchanged in the discussions of EM elicited neuroplasticity. In this project, we will apply precise control of stimulus parameters to synaptic pathways, and compare effects of various simulation parameters on synaptic plasticity.

◆Poster 71◆

Primary Structure Information and the Conservation of Functional Uncertainty

Presented by Omar Zahra,
Supported by Dr. Daniel Graham, Chemistry and Biochemistry

Proteins are the molecules that make life possible. They are composed of amino acid sequences with over 100 million on record. Protein sequences are random, by and large. This makes it challenging to infer component identity and functions, given partial information about a sequence. The project focuses on the uncertainty of inferring functions, based on the information provided by natural proteomes. Significantly, functional uncertainty was found to be a conserved property across archetypal proteins and proteomes. Further, the information of at least 1000 proteins is required for uncertainty for maximum correlations and conservation.

◆Poster 72◆

Network Connectivity and Signaling in Visual Analogical Reasoning

Presented by Shana Ward, Sara Temelkova; Mulcahy Scholars Program
Supported by Dr. Robert G. Morrison, Psychology

Analogical reasoning fosters human understanding and learning by establishing links between two sources of information in order to make comparisons and inferences. We used scalp electroencephalography (EEG) recordings taken from subjects as they solved visual analogy problems. We analyzed this data using time/frequency analysis (TFA) and independent component analysis (ICA) techniques in EEG Lab. We hypothesized that neural activity in the frontal and parietal gamma band (30-80 Hz) will be important for solving analogies, and that linked activity between prefrontal and parietal neural generators in the theta band (4-8 Hz) will also be important for good analogy performance.

◆Poster 73◆

Postcolonial Studies in Latin America

Presented by Patrick O'Brien; Social Justice Fellowship
Supported by Dr. Héctor García Chávez, Modern Languages

Postcolonial studies defines the causes and effects of colonialism around the world. Latin America, particularly Mexico, has often been left out of this conversation. Our research argues for the inclusion of Latin America, particularly Mexico, in the conversation of postcolonial studies.

♦Poster 74♦

Formation and Stability of Subsurface Oxygen in Ag(111)

Presented by Christian Hecht

Supported by Dr. Dan Killelea, Chemistry; Marie Turano, Chemistry

Silver plays a large role in heterogeneous catalysis. It is a relatively abundant transition metal and fairly inexpensive, it is widely used as a catalyst. For example, Ag is the catalyst for epoxidation. However, despite its widespread use, the O/Ag surface structures are not very well understood. The reason for this is that depending on the O source, a variety of surface structures may form. What we are interested in investigating is what happens with Ag is exposed to O? What structures form? How can we control these structures? What parameters are there to manipulate to form a desired structure?

♦Poster 75♦

Adaptations of Communication to Uphold Human Dignity

Presented by Ariana Allen Allen

Supported by Andrew Miller, Center for Experiential Learning

Throughout my year at Misericordia I have been taught that means of communication are not always linear. There are many different ways to communicate with those who hold different identities and the optimal means of communication should strive to uphold the human dignity of all parties involved. With this presentation I have aimed to describe the ways in which Misericordia has taught me to communicate in ways other than what I have been accustomed. This presentation will demonstrate the ways in which I learned how to communicate with those living with developmental disabilities and the ways I can incorporate these practices into everyday situations.

♦Poster 76♦

Shock Instability and Pattern Formation in Vertically Oscillated Granular Media

Presented by Nicholas Corkill; Mulcahy Scholars Program

Supported by Dr. Jon Bougie, Physics

We study shocks and patterns in vertically oscillated layers of grains using methods of granular hydrodynamics. Granular layers are thrown off an oscillating plate when the downward acceleration of the plate exceeds that of gravity. When the layer contacts the plate later in the cycle, a shock forms that travels through the layer simultaneously creating a standing wave pattern. In analyzing the results from our simulation, we found a frequency dependence of the shock indicating multiple regimes in the flow. A transition between regimes appears to correlate with the transition between stripe and square patterns that are observed experimentally.

♦Poster 77♦

Cultural Influences on Second Generation Filipinos Nurses

Presented by Kristamae Masiclat; Provost Fellowship

Supported by Dr. Jorgia Connor, Nursing; Dr. Regina Conway-Phillips, Nursing; Dr. Jorgia Connor, Nursing

My aim for this project is to explore reasons why second-generation nursing students chose nursing as their career path, and to find out and identify the cultural influences associated with that choice. There have been studies that explain why a large number of Filipinos immigrated to the United States for nursing, but there is definitely a lack of knowledge and understanding on second generation Filipino nursing students. Nursing still remains a dominant career path for Filipinos. I have conducted interviews with second-generation Filipino nursing students from different nursing programs and have identified common trends associated with their career choice.

♦Poster 78♦

The Lili Elbe Digital Archive

Presented by Audrey McCann

Archiving "Man Into Woman"

♦Poster 79♦

Variations in Riverine Microplastic Abundance and Associated Microbiomes with Watershed Land Use

Presented by Paul Risteca, Kelli Rogers; Mulcahy Scholars Program, Provost Fellowship

Supported by John J Kelly, Biology, Tim J Hoellein, Biology; Rachel E. McNeish, University of California Bakersfield

Microplastic particles (< 5mm) have been identified in aquatic ecosystems worldwide. High concentrations have been found in urban rivers downstream from wastewater treatment plants and cause alarm for potential pathogenicity. Questions remain about microplastic abundance and microbiome composition across different watershed land use types. Therefore, we sampled surface water from 8 major Lake Michigan tributaries. Urban and agricultural land-use were positively related to water column microplastic concentrations across all sites, and watershed forest coverage showed a negative relationship. Ongoing work is using high-throughput sequencing of 16S rRNA amplicons to assess variations in microplastic microbiome composition across these land use types.

♦Poster 80♦

Urban Cleansing: The Near North Side “Slum” and the Antiseptic Renewal Project of Sandburg Village

Presented by Shelbi Shultz

Supported by Dr. Leslie Dossey, History; Dr. Timothy Gilfoyle, History

The Carl Sandburg Village apartments were created with the intention of eradicating a neighborhood afflicted with urban “blight” in favor of a refined and functional community. Although the Sandburg Village dwellings fulfilled their purpose of completely changing the landscape of the Near North Side with modern housing, the planned development of community lacked in some respects. Ironically, the marginalized groups displaced by the Sandburg Village bulldozers cultivated their own community in their common goal to never be expelled again by dreams of urban renewal.

♦Poster 81♦

Student Sex Work: Online Sugar Babies & the Question of Agency

Presented by Natasha Slavin

Supported by Dr. Martel Cohen, Sociology; Dr. Krogh, Sociology

As college tuition in the United States rises to unprecedentedly high costs, many students are turning to the informal economy of sex work in order to meet basic living expenses and to minimize student debt. With the advent of online/phone applications for sex workers to meet potential clients, many female college students use the website SeekingArrangement to register an account as a “sugar baby” in order to meet “sugar daddies”—typically older men who provide substantial financial compensation for companionship and sexual services provided by these young women. This research seeks to examine the relationship between sugar babies and agency—more particularly, how agency is denied to and reclaimed by student sex workers.

♦Poster 82♦

Evaluating the Potential of FFPE Tissues for Retrospective Analysis of the Microbiome

Presented by Aarifah Bandyal, Benish Baqai

Supported by Dr. Michael Burns

The human body is host to a wide array of microbial communities and recent research has demonstrated that alterations in these communities may play a role in cancer. When assessing microbial communities, it is challenging to specifically collect samples for microbial testing. Standard practice when evaluating cancer status from tissue biopsies and resections is FFPE processing. Our study compares microbial communities present in fresh, frozen, and FFPE processed tissues using chicken as a model for human samples. Comparisons of the microbial community assessments from each of the communities should inform researchers about the feasibility of retrospectively using these samples.

♦Poster 83♦

Influence of Water Quality on the Acute Toxicity of Cadmium to the Florida Apple Snail, *Pomacea paludosa*

Presented by Justin Sanchez

Supported by Dr. Tham C. Hoang; Son Trinh, Institute for Environment and Recourses

This study determines the influence of water quality on the bioavailability and acute toxicity of Cd to the Florida apple snail (*Pomacea paludosa*) in support of development of water quality guidelines for tropical environments. 96-h acute toxicity tests were conducted with *P. paludosa* in waters at various hardness, DOC, and pH. Survival of snails was measured to determine lethal effect concentrations (e.g., NOEC, LOEC, LC5, LC50). Results of the present study show that the toxicity of Cd was strongly influenced by water quality. The toxicity significantly decreased when water hardness, DOC, and pH were increased.

♦Poster 84♦

Powersum Basis for r-Quasisymmetric Functions

Presented by Anthony Lazzeroni; Provost Fellowship
Supported by Dr. Aaron Lauve, Mathematics

The algebra of r-quasisymmetric functions (r-QSym) lies between the symmetric functions (Sym) and quasisymmetric functions (QSym), where QSym is the same as 1-QSym and Sym is equivalent to infinity-QSym. These extremal settings have nice bases that carry combinatorial and representation-theoretic information: the Schur basis and powersum basis (Sym); and Gessel's fundamental basis (QSym). The goal is to give a combinatorial proof (due to Garsia and Wallach) that r-QSym is a free module over Sym of dimension n!. Here, we define new powersum functions for r-QSym; show that they form a basis for all r; and their interaction with Schur's functions.

♦Poster 85♦

Metal Catalyzed Decarbonylation of Aryl Fluorides to Form Aryl Fluorides.

Presented by Sumeed Manzoor; Mulcahy Scholars Program
Supported by Hee Yeon Cho, Chemistry and Biochemistry

This project aims to successfully describe a method of using metal catalysts to form aryl fluorides from carboxylic acid derivatives. The aryl fluorides can be used in common cross coupling reactions that exchange fluorine for a desired functional group. This reaction is desirable due to the inexpensive and prevalent nature of carboxylic acids and carboxylic acid derivatives. The resulting aryl fluorides are important organic compounds due to the small steric size and high electronegativity of fluorine, which is relevant for increasing the bioavailability and changing the lipophilicity of pharmaceutical drugs.

♦Poster 86♦

Free Will in the World of Harry Potter

Presented by Justin Jimenez
Supported by Dr. Lauren O'Connell, Theology

In this presentation, I will explore the presence of free will in the universe created by J.K. Rowling. I will also determine to what extent free will exists in the Harry Potter universe.

♦Poster 87♦

Influence of Microfiber Types on Microbial Community Composition

Presented by Stuti Desai; Biology Summer Research Fellowship, Mulcahy Scholars Program
Supported by Dr. John Kelly, Biology

Microplastics, defined as plastic particles less than 5 mm in size, can originate from the breakdown of larger plastic debris or from a range of consumer products, including soaps, cleansers, and synthetic textiles. Numerous studies have documented the presence of different types of microplastic in aquatic habitats worldwide. A major concern about microplastic in the environment is their tendency to be colonized by microorganisms, including pathogens. This project analyzes how the microbial communities attached to various microfiber types differ in composition.

♦Poster 88♦

Synthesis of Folate-Targeted Photodynamic Therapy Agents

Presented by Salama Lipdo; Mulcahy Scholars Program
Supported by Dr. Ken Olsen, Chemistry and Biochemistry; Dr. Stefan M. Kanzok, Biology

The focus of this research was to develop effective PEG and BSA-based, doubly-selective photodynamic therapy agents. Chlorin e6 (Ce6), a photosensitizer, and folate, a vitamin necessary for the development of rapidly dividing cells such as cancer cells, were reacted with polyethylene glycol (PEG) or bovine serum albumin (BSA). This compound can enter cells through receptor-mediated endocytosis and cause apoptosis when irradiated by light of specific wavelengths. Our goal was to observe the effects of folate and the use of two carriers (PEG and BSA) on the toxicity of the drug on HeLa cells.

♦Poster 89♦

Selective Targeting of Cells in Zebrafish Using Folate-Mediated Photodynamic Therapy Agent

Presented by Barbara Szynal; Mulcahy Scholars Program
Supported by Dr. Ken Olsen, Chemistry and Biochemistry; Dr. Rodney Dale, Biology

In recent years, there has been great emphasis on the development of novel cancer treatments that cause fewer side effects than traditional therapies. Current therapies have unwanted side effects because they do not differentiate between healthy cells and tumor cells, and they offer no guarantee that tumor tissue will be eliminated. This project aims to synthesize and test a protein-based photodynamic therapy agent that provides two levels of selectivity for tumor cells, thus minimizing or eliminating side effects. The compound is tested in zebrafish embryos to determine effectiveness.

◆Poster 90◆

Exposure to Community Violence and Suicidal Ideation in Adolescent African American Males

Presented by Pimaa Mintah

Supported by Noni Gaylord-Harden, Psychology; Amanda Burnside, Clinical Psychology

I aim to study the relationship between exposure to community violence and suicidal ideation in adolescent African American youth. Urban communities often have higher rates of gangs and gang violence in which they report higher rates of violent offending, nonviolent delinquency, and victimization than their peers (Madan, Mrug, & Windle). Research suggests that being vulnerable to violence does not necessarily mean that youths will develop depression or anxiety but it is the possibility of internalizing certain traumas or events, such as death or injury, that can cause suicidal ideation among adolescents in this population.

◆Poster 91◆

The Effectiveness of the Arginine Deiminase System Present in *S. gordonii* to Buffer Lactic Acid Produced by *S. mutans*

Presented by Richard Padovano; Mulcahy Scholars Program

Supported by Dr. Domenic Castignetti, Biology

S. mutans is a lactic acid bacterium that contributes to cavity formation. *S. gordonii* is an oral bacterium that contains the Arginine Deiminase System (ADS). We are investigating whether the ADS in *S. gordonii* can produce enough ammonia to buffer the lactic acid produced by *S. mutans*, and this is done through co-culturing the bacteria and measuring the pH. Prior to co-culturing, pH drops were done to analyze the lactic acid production of *S. mutans* and ammonia production of *S. gordonii*. Protein determination assays were done to grow the same amount of both bacteria.

◆Poster 92◆

Sustainability Reporting Rising

Presented by Rachel Phan; Provost Fellowship

Supported by Thomas Zeller PhD; Johnson Scholars

◆Poster 93◆

Safety Measures in Radiological Medical Procedures: Retrospective Analysis

Presented by Daniel Derylo

Supported by Dr. Fawad Qureshi, Vascular Access Centers of Illinois; Dr. Bogdan Derylo, Vascular Access Centers of Illinois

The study involves one practice which owns two dialysis access interventional suites. Lab A used an arm rest apron to shield from scatter radiation, Lab B did not. This comparison study took place over 12 months during 2016. The radiation exposure of two physicians from each lab was measured utilizing film badge dosimeters that all the physicians carried throughout their procedures. The method of analysing the arm rest apron's effectiveness was by using a ratio of the radiation exposure accumulated over a year measured by the physicians' badge readings (in mrem) to the number of procedures each physician performed.

◆Poster 94◆

Modulation of the Human Gut Microbiome by the Biologically Active Dietary Compounds

Presented by Vraj Patel

Supported by Dr. Michael Burns, Biology

The intestinal microbiome regulates many physiological functions in human health such as the regulation of metabolic homeostasis. The microbiome is a dynamic ecosystem influenced by a plethora of variables. In this project, we are investigating curcumin, a bioactive component in turmeric, which known for its antitumor, and anti-inflammatory properties. However, the poor bioavailability of curcumin means that most of the compound remains in the digestive tract. Therefore, as curcumin remains mostly in the gut, we hypothesize that many of its beneficial effects are mediated through its influence on gut flora, which is demonstrated by tracking the changes of the microbiota

♦Poster 95♦

The Effect of Molecular Crowding on the Dynamics of DNA Hairpins

Presented by Deema Martini; Mulcahy Scholars Program
Supported by Dr. Brian L. Cannon, Physics

Repetitive DNA motifs comprise a large fraction of our total genomic content. Numerous genetic diseases are linked to instabilities associated with these motifs at specific genetic loci. Pathogenesis of familial amyotrophic lateral sclerosis (ALS) likely arises from non-helical structure formation involving the G4C2 motifs within the gene C9orf72. Here, the structural dynamics of single-stranded DNA containing multiple copies of the repeat sequence G4C2 was characterized by single-molecule fluorescence microscopy. Continuous switching between an unstructured state and a hairpin (non-duplex) conformation were clearly observed. The presence of a molecular crowding agent that mimics cellular conditions altered the switching behavior.

♦Poster 96♦

Isobaric Divided Difference Operators

Presented by Pragna Bhatt
Supported by Aaron Lauve, Mathematics

The goal of this project is to build a new basis for r -quasisymmetric functions (r -QSym). We do this because we wish to interpolate between the Schur basis for symmetric functions (Sym) and Gessel's fundamental basis for quasisymmetric functions (QSym) - which correspond to the case $r=\infty$ and $r=1$, respectively. These two bases are defined in terms of isobaric divided difference operators, so we propose an analogous construction to create a new basis for r -QSym. We prove that the result is indeed a basis for r -QSym. We compare and contrast these functions to the functions of Schur and Gessel.

♦Poster 97♦

Spectrophotometric Assay for Potency of Potential Antibiotics

Presented by Elliot Gild; Mulcahy Scholars Program
Supported by Dr. Daniel Becker, Chemistry; Thahani Shifna Habeeb Mohammad, Dr. Chemistry; Tahirah Heath, Chemistry

Antibiotic resistance is a growing problem plaguing the current medical and pharmaceutical communities and antibiotic breakthroughs are slowing every year. It is known that the bacterial enzyme N-succinyl-L, L-diaminopimelic acid Desuccinylase (DapE) is a critical late stage enzyme in the bacterial biosynthetic pathway of lysine, the essential amino acid. Without it the cell wall of bacteria cannot be formed and bacterial growth and proliferation would be stopped. Based on structure activity relationship compounds with inhibition potential have been synthesized and using a biochemical assay, the potency of the synthesized inhibitors can be tested very precisely and compared to one another.

♦Poster 98♦

Role of Anaplastic Lymphoma Kinase in Drosophila Gonad Development

Presented by Anusha Gangani; Mulcahy Scholars Program
Supported by Jennifer Mierisch, Biology

Investigating embryonic development in *Drosophila* is a useful way to understand the molecular mechanisms that influence organ formation. The characteristic that allows further analysis of the organs include the two different cell types that exist in the embryo, the somatic gonadal precursor (SGPs) cells and primordial germ cells (PGCs). This project investigates the role of the Alk gene in *Drosophila* gonadal development. We use a variety of methods including immunohistochemistry as well as the GAL4/UAS system in order to understand the role that the Alk gene may play in the developing gonad.

♦Poster 99♦

Construction and Applications of Grazing Incident X-Ray Fluorescence Spectrometer

Presented by Szymon Kasperek; Mulcahy Scholars Program
Supported by Dr. Martina Schmeling, Chemistry and Biochemistry; Dr. Elizabeth Jamka, Chemistry and Biochemistry

Total reflection x-ray fluorescence spectrometry (TXRF) and grazing incidence x-ray fluorescence spectrometry (GIXRF) are non-destructive analysis methods for multi-element analyses. Both types of instrumentation use x-rays to excite elements within the sample and each element emits a fluorescence energy that is unique to the element. Through GIXRF and TXRF, depth and surface profiling can be performed nondestructively. A major application for the GIXRF will be the analysis of NASA Genesis

samples that were contaminated and fragmented. Carbon dioxide snow cleaning is a nondestructive device for surface cleaning by utilizing a stream of dry ice particles through physical and solvent interactions.

♦Poster 100♦

Used Coffee Grounds (UCG) as an Alternative Soil

Presented by Sam Guthman

Supported by Dr. Ray Dybzinski, Institute of Environmental Sustainability

Instead of wastefully sending them to the landfill, used coffee grounds (UCG) can be repurposed as a soil substitute. To determine the feasible range of soil replacement by UCGs and to gain more knowledge about its properties, we conducted four tests: a pH analysis, a germination experiment, a nutrient experiment, and an experiment to determine the best UCG soil analog. The experiments showed that growth was possible with a high ratio of UCG to soil (90:10 to 100:0), but sustained growth required amendments. Future research will further test UCG capabilities through various species experimentation and microbial additives.

♦Poster 101♦

The Use of Expressive Art to Cope with Stress in African American Adolescents

Presented by Janaei Phillips

Supported by Noni Gaylord-Harden, Psychology

The current study examines the use of expressive art as a coping mechanism in 264 African American adolescents (55% female; mean age = 12.91, SD = 1.27). Results demonstrated that the 76% of the sample engaged in writing (poetry, songs/raps, stories) and 79% did something artistic to cope with stress (drawing, singing). Compared to youth who did not use expressive art to cope, adolescents who wrote poetry reported less anxiety ($t[254]=-3.43, p=001$), and youth who used singing reported more anxiety ($t[254]=-4.35, p<001$). There were no differences for depression. Additional analyses will examine age/grade and gender effects.

♦Poster 102♦

The Role of the Microbiome in the Process of Wound Healing

Presented by Eyad Xoubi

Supported by Dr. Michael B. Burns, Biology

The human microbiome consists of communities of microorganisms, predominantly bacteria. The microbiome is affected by its resident tissues, and in turn the microbiome influences these tissues. This literature review was conducted to explore the relationship between the microbiome and wound healing. The healing process could accelerate or deteriorate depending on alterations in diversity, community composition, or function of the community at the wound site or indirectly via the gut microbiome. Recent studies have demonstrated that the microbiome does indeed influence wound healing and that modulation of the microbiome might have potential as a therapeutic intervention.

♦Poster 103♦

El Salvador Refugee Crisis: A Political, Sociological, and Ethical Perspective

Presented by Madeline Cahue

Supported by Muhammet Asil, Political Science

This presentation analyzes the refugee crisis in El Salvador, specifically focusing on the causes and effects, of the Civil War and continued violence, as well as the displacement, migration, and resettlement of survivors. Using a political, sociological, and ethical perspective, I will discuss the repercussions of the crisis for El Salvador and the global order, questioning who the agents and actors are, as well as former responses. Based on these three perspectives, I will explore new and more effective solutions for migrants from El Salvador who continue to flee, as the crisis increases and policies and rhetorics change.

♦Poster 104♦

Feasibility Study of Lead Leaching Rate Measurement from New and Aged Galvanized Water Supply Pipes

Presented by Madeline Demo; Provost Fellowship

Supported by Dr. Zhenwei Zhu, Institute of Environmental Sustainability

Galvanized pipes were commonly used in the construction of water supply at Chicago Public Schools before 1960, and we now know that lead gradually leaches out from those pipes into drinking water. Long periods of water stagnation in galvanized pipes leads to elevated lead concentration detected in drinking water. Therefore, knowing the lead leaching rate is critical to estimat-

ing the maximum time of stagnation allowed to maintain lead levels below a threshold. This project serves as a feasibility study for the Chicago Public School District, and involves testing of various pipe materials with lead and orthophosphate water treatments.

♦Poster 105♦

Microplastic in aquatic Food Webs: Museum Specimens and Ingestion Experiments Reveal Controls on Microplastic Ingestion by Freshwater Fish

Presented by Amy Fetters, ;

Supported by Dr. Timothy Hoellein, Biology ; Loren Hou, Biology

Microplastic is a ubiquitous contaminant of freshwater ecosystems. Microplastic (plastic < 5mm) has been found to be present in aquatic food webs, but little research provides background for when microplastic was historically introduced or how organisms retain it upon ingestion. By analyzing microplastic presence in preserved fish specimens dating from 1900-2018 (Field Museum, Chicago), microplastic abundance was seen to have steadily increased in multiple fish taxa from 1950 to present. A second project, where round gobies were given a microplastic diet varying in duration, revealed that microplastic was retained in digestive tissues with most excreted within 72 hours following ingestion.

♦Poster 106♦

Chiral Catalyst Synthesis for Organocatalytic Carbene Insertion Reactions

Presented by Sadek Alnass; Mulcahy Scholars Program, Provost Fellowship

1,1'-Bi-2-naphthol (BINOL) has been successfully used for various asymmetric processes over the past 2 decades. Preparation of (R)- 3,3'-Ph2BINOL from BINOL via a four-step synthesis will result in a product which readily catalyzes carbene insertion reactions. Carbenes are a highly reactive class of uncharged molecules which can be modified to yield geminal silylboration and geminal carboboration products in the presence of (R)- 3,3'-Ph2BINOL. In addition, this chiral organocatalyst is environmentally friendly, readily disposable, and it is not air sensitive. These qualities are generally not found in metal catalysts and thus the exploration of organocatalysts is of great interest.

♦Poster 107♦

The Effect of Technological Evolution on Human Faith through the Book "American Gods" written by Neil Gaiman

Presented by Alina Gorodnia

Supported by Dr. Lauren O'Connell, Theology

The purpose of this study is to explore Gods and their origin in the book "American Gods". The goal of this study is to answer the research question: How does progression of human world in the book written by Neil Gaiman "American Gods" perpetrate human ability to preserve faith in Gods. The study will argue and prove the interdependence of evolution and renouncing of faith.

♦Poster 108♦

School Sense of Community, Future Expectations, Academic Achievement: A Relationship Analysis

Presented by Osmar Cruz

Supported by Cynthia Onyeka; Dr. Maryse Richards, Psychology

Due to the great amount of time spent in school, learning the dynamics of a school environment can help better understand how schools can enhance education in places of need. We focused on the south and west side of Chicago and on student's school sense of community as it relates to their academic success, and influence on future expectations. Several statistical significant result were found opening up doors for future research on school environment.

♦Poster 109♦

Beyond the Lesson Plan: How the Classroom Creates Culture in the West and East

Presented by Grace Mabulay

Supported by Amy Kyhos, Quinlan School of Business Honors Program

Two areas of focus are explored within this paper: the perceived role of education and the definition of harmony illustrated by the social structure of the classroom. The origin of personality has been a point of conflict between proponents of "nature," a genetic source, versus that of "nurture," an environmental one. A unique approach lies in the Cultural-Historical Theory, predicting that personality development is a historical and social account of an individual's integration into society. The classroom is therefore not only a contributor to children's personalities, but also a promoter of cultural-conditioning and the formation of a culture's own personality.

◆Poster 110◆

Evaluation of the Transposition of Gmr8 LTR Retrotransposons and Their Role in the Domestication of Soybean

Presented by Dana Elchami; Mulcahy Scholars Program
Supported by Dr. Howard Laten, Biology

Long Terminal Repeats are a class of retrotransposons that flank TEs (transposable elements) and are repetitive sequences vital for transposition. Because the movement of TEs could lead to genetic variation that may alter the phenotype of an organism, we can infer that a species of soybean may be evolving because of the transposition of these TEs in the soybean genome over time. By understanding the evolutionary history and insertional polymorphisms of Gmr8 TE family members in *Glycine max* and *Glycine soja*, we hope to better understand how the insertion of Gmr8 could potentially lead to distinct phenotypes of agricultural benefits.

◆Poster 111◆

Identification of Circadian Output Genes Affecting Rhythms in Drosophila

Presented by Naisarg Vanani; Mulcahy Scholars Program
Supported by Dr. Daniel Cavanaugh, Biology

Three components compose the circadian system in *Drosophila*: input pathways, core clock, and output pathways. To understand the molecular basis of output pathways, we reduce the expression of certain target genes specifically within output cells of interest. If reducing a certain gene's expression causes flies to lose their circadian rhythms, we know that particular gene is vital to the *Pars-Intercerebralis*' ability to function as part of circadian output pathways. These experiments help identify which genes are crucial in circadian outputs in *Drosophila*, and can eventually help us better understand the molecular basis of circadian rhythms in other organisms, including mammals.

◆Poster 112◆

Assessing the Effects of a Mindfulness Mobile App on Savoring Beliefs and Depression

Presented by Khrystyna Stetsiv; Provost Fellowship
Supported by Dr. Colleen Conley, PhD, Clinical Psychology; Dr. Rebecca Silton, Clinical Psychology; Brynn Huguene, Clinical Psychology

Building on prior research, this study assessed whether practicing mindfulness via a mobile app, Headspace, would decrease depression, and whether the savoring of positive beliefs would mediate this process. 48 undergraduate students were randomized to the mindfulness intervention or a waitlist control group, with measures assessing depression, mindfulness use, and savoring delivered at multiple timepoints throughout the 8-week study. Depression significantly decreased only within the intervention group, supporting the hypothesis. Total levels of savoring did not significantly increase, although Savoring the Moment subscale approached significance. The mediating role of savoring in the effect of mindfulness on depression was not significant.

◆Poster 113◆

Molecular Docking: Helping Us Make Antibiotic Resistance a Threat No MOE

Presented by Michael Serwetnyk
Supported by Dr. Daniel Becker, Chemistry and Biochemistry

Aminoglycoside-modifying enzymes (AMEs) are one of the many ways in which bacteria have developed resistance to our antibiotic arsenal. They function by chemically adding molecules like N-acetyl groups to aminoglycosides, preventing them from killing the pathogen via binding to their ribosomes. Numerous N-acetyltransferases (AACs) have previously undergone structural and enzymatic characterization with the purpose of understanding their catalytic mechanism. Computational analyses like molecular docking supplement this information by providing insights regarding the interactions between the proteins' amino acid residues and ligands. Altogether, this information potentially provides the necessary tools to design improved aminoglycosides or to devise inhibitors of AMEs.

◆Poster 114◆

Dopamine Projections of the Pedunculopontine Tegmental Nucleus

Presented by Dharm Sodha; Mulcahy Scholars Program, Provost Fellowship
Supported by Dr. Stephan Steidl, Psychology

Brain dopamine is fundamental to understanding motivational and reward based behavior. The Ventral tegmental area contains dopamine neurons that project to the forebrain area. The pedunculopontine tegmental nucleus (PPTg) have projections that use acetylcholine as a neurotransmitter and is isolated in our study through the use of optogenetics. A virus is transfected into the mice which introduced a light triggered chloride pump in order to target and inhibit the PPTg. 4 groups of mice, 2 of them being controls receiving a fluorescent virus. The mice will be conditioned for 8 days and then a preference test will be run.

◆Poster 115◆

The Nature and Examination of Adult Attunement in Mentoring Relationships

Presented by Melanie Minuche; Provost Fellowship

Supported by Dr. Julia Pryce, School of Social Work; Dr. Linda Gilkerson, Erikson Institute; Montserrat Vazquez, MSW; Luke Bandyk, School of Social Work

Based on training conducted across program sites and cultural contexts, using the Mentoring FAN model (Facilitating Attuned Interactions; Gilkerson & Pryce, under review; Pryce & Gilkerson, 2018), findings suggest value in promoting attunement to strengthen staff-mentor relationships by increasing staff empathy, collaboration, confidence, and commitment. We explore the concept of attunement in more detail, in terms of measurement, the roles of mentors/supportive adults, the experience of group identity, well-being, and cultural relevance. Through case-based illustrations, we examine the role of reflective practice and theories of interpersonal communication in youth mentoring, as well as other relationship-based interventions.

◆Poster 116◆

Higher Education Attainment Among Children of Immigrants

Presented by Manuel Gomez

Supported by Tim Classen, Economics

This research draws comparison to Lauderdale and Heckman's (2017) examination of the "immigrant advantage" associated with children of immigrants being more likely to earn college degrees than the children of native-born parents in the United States. Perna's model (2006) is used as an economic and sociological foundation for generating variables from NLSY97 data that can be used to further explore the "immigrant advantage".

◆Poster 117◆

Impact of Commonly-Ingested Substances on the Gut Microbiome

Presented by Abigail Erickson

Supported by Dr. Michael Burns, Biology

The human gut microbiome may have a wide range of variability within a single person, however, the individual causes of such changes are largely unknown. Our study is testing how the gut microbiome changes in response to nicotine, theobromine, caffeine, BPA, BPS, and capsaicin. We determined these effects by introducing varying doses of each compound to a standard microbial community taken from a healthy donor. The results of this experiment may help us understand the role that diet has on an individual's gut microbiome.

◆Poster 118◆

Formative Experiences in Migration Focused Courses

Presented by Fernanda Gonzalez; Social Justice Fellowship

Supported by Maria Vidal de Haymes, School of Social Work; Marta Lundy, School of Social Work

Given the human cost and social justice considerations associated with migration in the region, the Loyola School of Social Work has developed a Migration Studies Sub-Specialization and various migration-focused immersion courses for BSW and MSW students. The focus of the current study is on how students, as well as the Mexican NGO hosts, field work supervisors, and faculty program partners are impacted by their participation in the Loyola immersion courses and field practicum experiences. My component of the study relies on a text-based analysis of in-person and video call interviews and focus groups collected in Guadalajara, Mexico and Chicago, Illinois.

◆Poster 119◆

Time Series on Lacrimal Stem Cell Differentiation

Presented by Shreya Wadhwa; Mulcahy Fellowship

Supported by Dr. Catherine Putonti; Dr. Vinay Aakalu, Biolog

This study conducts a time series analysis of the differentiation of lacrimal epithelial cells from stem cells using the STEM software. The experiment is set up so that day 0-3 is the induction period and day 4 onwards increases surface ectodermal marker expression, which should lead to differentiation. During the induction period, we induce the primary ectodermal lineage,

which is the first germ layer that emerges during gastrulation. From Day 4-40, we grew the iPSCs on a placental collagen coated plate, with two conditions +FGF10 or – FGF10. The STEM analysis looks for changes in gene expression over this experiment.

◆Poster 120◆

The Role of Ribbon in Gonad Development

Presented by Lana Tinawi; Mulcahy Fellowship
Supported by Dr. Jennifer Mierisch, Biology

Regulation of gene transcription is critical for proper development of functional organs. Ribbon is one of many transcription factors required for tissue morphogenesis in the fruit fly, *Drosophila melanogaster* (Loganathan et al., 2015; Silva et al., 2016). Rib may also play a part in regulating gonad morphogenesis and gametogenesis in the adult testis. Overexpression of rib in somatic cells of the gonad has significant effects on gonad development. In females with increased Rib levels, the ovary fails to form an organ with proper structure. In males with increased Rib levels, testes are truncated in size and sometimes are completely absent.

◆Poster 121◆

The Role of Hedgehog Signaling in Craniofacial Development of Anolis Lizards Under Normal and Stressed Incubation Conditions

Presented by Seerat Dhindsa; Mulcahy Fellowship, Summer Provost Fellowship
Supported by Dr. Thomas Sanger, Biology

Changes in the environment influence the developmental physiology of animal embryos. Thermal stressors alter the expression of genes that contribute to the development of an embryo's body. The *Anolis sagrei* embryo has been used as a model organism in order to deduce which specific pathways are influenced by thermal stress. The goal of this study is to analyze which genes within the hedgehog pathway are influenced, and specifically whether the regulation of these genes are the cause of the morphological changes in the skull and brain of anole embryos.

◆Poster 122◆

Predictive Factors for Laparoscopic Inguinal Hernia Recurrence

Presented by Jaqueline James
Supported by Dr. F. Bryan Pickett; Kara Donovan; Merritt Denham; Dr. Michael Ujiki, Biology

Laparoscopic inguinal hernia repair is a fairly common procedure, thus making it a noteworthy clinical problem. For this reason, we must aim to reduce the necessity for reoperation in hernia patients by identifying specific preoperative risk factors that may contribute to recurrence. We investigated the effects of gender, age, prior hernia repair history, and preoperative comorbidities on hernia recurrence by reviewing the medical charts of inguinal hernia repair patients. The results of this study demonstrated that gender was a significant risk factor for recurrence, while prior comorbidities such as obesity, diabetes, and COPD were not significant indicators for recurrence.

◆Poster 123◆

Job Development at Catholic Charities

Presented by Shamaal Shahzad
Supported by Andrew Miller, Center for Experiential Learning; Catholic Charities Kenmore; Ellen Sauter; Kate Kuhn; Alissa Jones

This presentation will delve into my time at Catholic Charities Kenmore as a Job Development Intern, looking to analyze the skills I learned and the projects I completed over the course of the 2018-2019 school year. I will also be looking to define my newly developed definition of social justice as it relates to refugee resettlement in Roger's Park as well as the importance of civic engagement in small communities.

◆Poster 124◆

Macroinvertebrate Assessment of Elodea Infested Ponds on the Copper River Delta in Southcentral Alaska

Presented by Matthew Scott
Supported by Dr. Martin Berg

Comparing aquatic macroinvertebrate abundance and community structures for various ponds on the Copper River Delta in Alaska aids in assessing ecosystem dynamics. Considering the effects of the non-native invasive aquatic plant *Elodea canadensis* and its impacts on these isolated ponds, this project aims to help in the understanding of treatment by the herbicide fluridone

to eradicate Elodea. This project acts a component within pre-, concurrent-, and post-treatment monitoring in both treatment and reference study ponds to allow for an increased understanding of the effects of Elodea removal on aquatic systems and fisheries.

◆Poster 125◆

Socio-Emotional Struggles of Undocumented Immigrant Woman

Presented by Juana Fonseca

Supported by Ruth Gomberg-Munoz, Anthropology

This research will address the question of how political changes are affecting the socio-emotional health of undocumented women. This research will attempt to establish the past and current struggles of this population. Women's narratives will be analyzed for patterns on their socio-emotional struggles as well as reappearing factors to which they attribute these struggles. I will conduct interviews and surveys to gain an understanding of how undocumented women have coped with and overcame their challenges. This research will inform policy recommendations, resource development, and program development to help inform and close the existing gaps in services to the undocumented immigrant population.

◆Poster 126◆

Synthesis of π -Conjugated Systems Containing Pentalene Units

Presented by Maxwell Harsha; Mulcahy Fellowship

Supported by Dr. Hee Yeon Cho, Chemistry and Biochemistry

Pentalene units are π -conjugated systems with unique structural and electronic properties. Molecules that contain these units have wide areas of application in organic electronics, organometallic catalysts, and medicinal chemistry. A known synthesis of a pentalene precursor can lead to the unknown oxidation reaction affording a dibenzo[a,f]pentalene derivative. After the unknown oxidation reaction is completed, the synthesis of the pentalene derivative will be optimized for efficiency.

◆Poster 127◆

The Compressibility of Protein Sequences

Presented by Brian Robinson

Supported by Dr. Daniel Graham, Chemistry and Biochemistry

Proteins have been investigated for decades via their three-dimensional structures and biochemical properties. In contrast, my project examines the primary structures of proteins solely by their abbreviated code representations in one dimension. By applying the Burrows-Wheeler Transform to representations, the permutation space for archetypal primary structures is explored selectively. In effect, the project looks at protein primary structures from alternative perspectives that nonetheless conserve information. The Burrows-Wheeler transforms of code strings obtain rapidly and require sparse computational power. Significantly, the project results offer new tools and insights for screening drug and antibody targets.

◆Poster 128◆

Investigating SAXO-1, a putative microtubule-associated proteins (MAPs) of Plasmodium

Presented by Filza Ali; Mulcahy Fellowship, Provost Fellowship

Supported by Dr. Stefan Kanzok, Biology; Griffin Berge, Biology

We have identified putative microtubule associated protein (MAPs) called SAXO-1. We hypothesize that SAXO-1 is a microtubule binding protein and I will test this by truncating SPM-1 at the N-terminus, C-terminus and various repeats. Once we truncate SPM-1, we can transfect those plasmids into in-vitro systems such as HeLa cells. HeLa cells are good for protein expression and can be easily visualized under Immunofluorescence Assays (IFA). Thus, we can identify the repeats which significantly contribute to microtubule binding and characterize the microtubule binding and stabilizing properties of SAXO-1 by truncation.

UNDERGRADUATE RESEARCH AND ENGAGEMENT SYMPOSIUM AWARDS

PALM COURT, MUNDELEIN CENTER FOR THE FINE AND PERFORMING ARTS
4:15 PM - 5:00 PM

OUTSTANDING LOYOLA UNDERGRADUATE RESEARCHER

This award has been established to honor Loyola undergraduates who conduct exceptional research, articulate their research to others, and enhance Loyola's reputation as a quality research university by integrating research into their academic learning experience.

LANGERBECK AWARD FOR UNDERGRADUATE RESEARCH MENTORING

The Langerbeck Award recognizes the exceptional work of Loyola's faculty mentors who are contributing significant time and effort to the intellectual, ethical, and academic development of undergraduate researchers.

GRADUATE STUDENT MENTOR AWARD

This award is designed to recognize the work that Loyola's graduate students perform in mentoring undergraduate researchers, fostering their intellectual, ethical, and academic development.

HAYES AWARD FOR ADVISING AND MENTORING

The Hayes Award recognizes faculty who demonstrate a commitment to advising and mentoring students within and outside the classroom. Excellent faculty mentors are involved in helping students discover their passions, develop a dedication to life-long learning, and guiding students' intellectual, personal, social, and spiritual growth.

LOYOLA UNIVERSITY LIBRARIES UNDERGRADUATE RESEARCH PAPER AWARD

This award recognizes outstanding research conducted by undergraduate students at Loyola University Chicago. The award is not only given based on the paper itself, but also the author's reflection on the research process, including the role of the library's resources and services.

COMMUNITY ENGAGEMENT AWARDS

The Community Engagement Award for Social Justice, Community Engagement Award for Innovation in Sustainability, Community Engagement Award for Impact, and Community Engagement Award for Solidarity will be presented to the student or group of students who represent an active and ongoing pursuit in social justice, sustainability, impact, or solidarity in their community.

LEARNING PORTFOLIO REFLECTION AWARDS

A learning portfolio (ePortfolio) is a digital collection of student's work, reflections, and educational experiences that demonstrate a student's work over time, featuring skills, abilities, values, and experiences. Because of their hard work, the CEL has established three awards: Creativity and Innovation, Critical Reflection, and Social Justice. Each of the following learning portfolio awards will be awarded to an undergraduate student or group of students who cultivated and curated a portfolio throughout a program or academic course at Loyola University Chicago during the academic year.

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