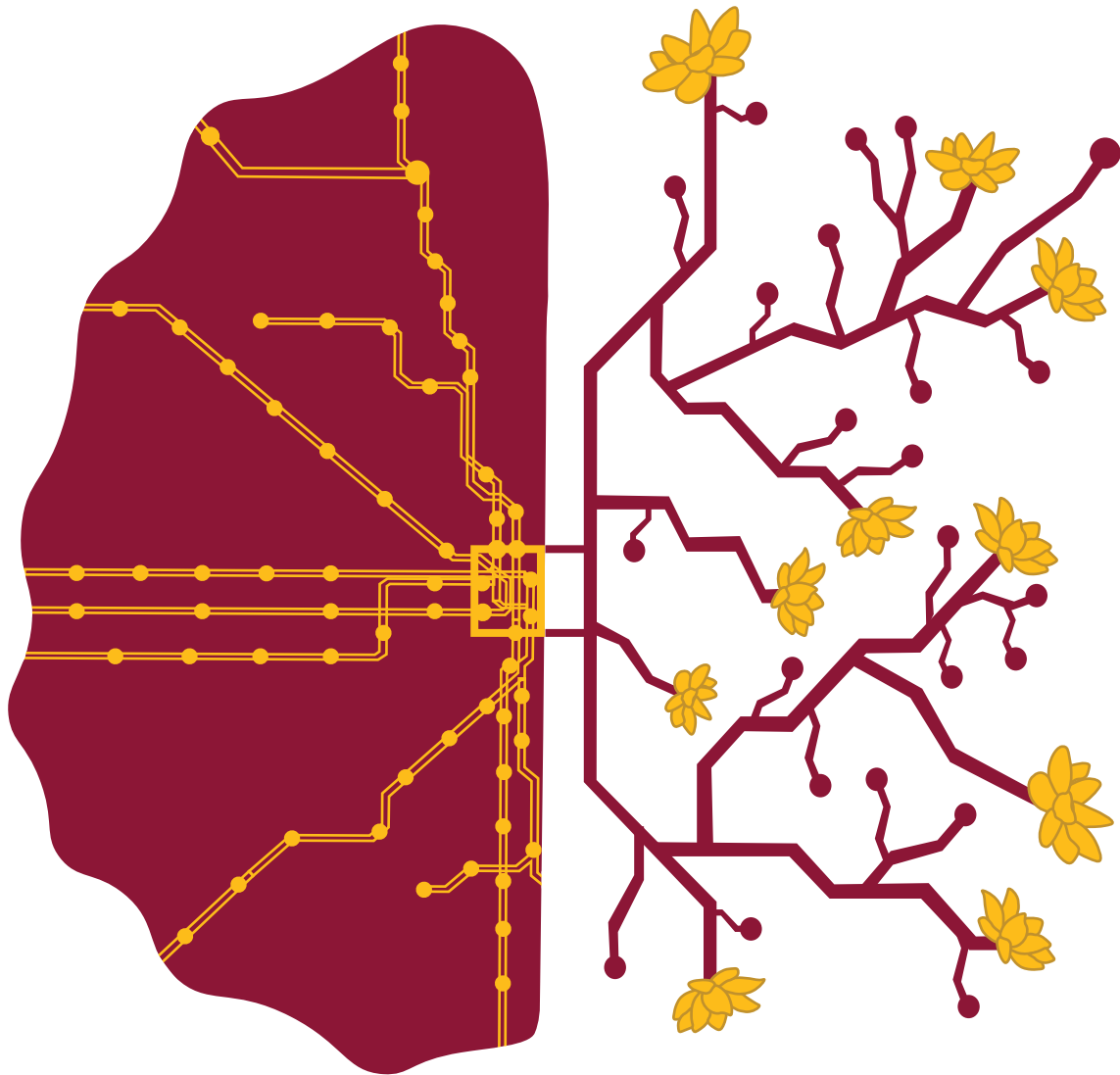


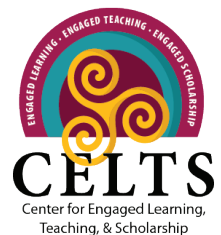
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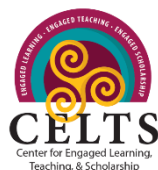
# UNDERGRADUATE RESEARCH AND ENGAGEMENT SYMPOSIUM



A CELEBRATION OF STUDENT  
RESEARCH, SCHOLARSHIP, AND  
COMMUNITY ENGAGEMENT

APRIL 22, 2023





## **A Celebration of Student Research, Scholarship, and Community Engagement**

Welcome to the 2023 Undergraduate Research and Engagement Symposium! The Center for Engaged Learning, Teaching, and Scholarship (CELTS) is excited to feature the work of Loyola students guided by their scholar mentors and sharing their research, creative works, scholarship, and community engagement projects. This year's theme, "A Celebration of Student Research, Scholarship, and Community Engagement," is quite fitting as we return to an in-person symposium this year!

For the past 15 years, this symposium has been Loyola's annual celebration of undergraduate student scholarship and research, including research from a variety of disciplines, 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 CELTS, we are excited to feature the work of students as they share their learning from courses and co-curricular experiences, whether through completed projects or ongoing research "in the works."

As a celebration of students' scholarly work, the symposium provides space for reflection upon, as well as critical interrogation into, many topics from multiple disciplinary and interdisciplinary perspectives. Through student research projects, community-based learning projects in 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 Loyola University Chicago Jesuit education. Such scholarship actively animates Loyola's mission to "expand knowledge in service to humanity through learning, justice, and faith."

We encourage you to take advantage of the wide array of student presentations at the 2023 Undergraduate Research and Engagement Symposium. 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 and co-created, and communities are strengthened. The breadth of multi-disciplinary projects are presented today in various formats, from posters to oral presentations and learning portfolios, as well as other creative presentations.

We thank the faculty, staff, and community partners who serve as mentors to our students, guiding them through the research process or engagement project – your work in facilitating 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 presenting at the Symposium.

We hope you enjoy the culminating projects and featured scholarship of our Loyola students. For more information about Loyola's Center for Engaged Learning, Teaching, and Scholarship (CELTS), a teaching and learning center at the intersection of innovative experiential learning pedagogy, community-engaged learning, and the scholarship of engagement, visit us at [www.luc.edu/CELTS](http://www.luc.edu/CELTS). To learn more about the undergraduate research program (LUROP), please visit [www.luc.edu/lurop](http://www.luc.edu/lurop). May the Symposium provide you with new insights, big ideas, and rich perspectives in learning!

In Service,

Patrick M. Green, EdD

Executive Director, Center for Engaged Learning, Teaching, and Scholarship  
Director, Engaged Learning University Requirement  
Clinical Assistant Professor, School of Education

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## SCHEDULE

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

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

Oral Presentations ----- 12:45PM-1:45PM  
(Mundelein Classrooms, Floors 2-6)

Poster Presentations; Session 2 ----- 2:00PM-3:30PM  
(Mundelein Auditorium)

Recognition Ceremony ----- 3:45PM-4:30PM  
(McCormick Lounge, Coffey Hall)

- ❖ *Outstanding Undergraduate Research Award*
- ❖ *Mary Therese Langerbeck Award for Undergraduate Research Mentoring*
- ❖ *Graduate Student Mentor Award*
- ❖ *Adolfo Nicolas SJ Excellence in Engaged Learning and Teaching Award*
- ❖ *Faculty Certificate in Experiential Education*
- ❖ *Community Engagement Award*
- ❖ *Learning Portfolio Reflection Award*
- ❖ *Community Partner Award for Coeducation*

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*Program Design and Front Cover Image was created by Loyola Students: Kayla Carizey,  
AJ Vargas, Francesca Dreher & Deanna Cipek*

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# LOYOLA UNDERGRADUATE RESEARCH OPPORTUNITIES PROGRAM (LUROP)

*In addition to hosting the 2023 Undergraduate Research & Engagement Symposium as part of the Center for Engaged Learning, Teaching, & Scholarship (CELTS), 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](http://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 Fellowship Program, coordinated by the Biology Department, offers the opportunity for students to engage in faculty-guided scientific research over multiple years.

## **Biology Summer Research Fellowship Program**

The Biology Summer Research Fellowship is a summer research experience coordinated by the Biology Department for majors interested in working on faculty research. Students are selected by faculty mentors to engage in this program.

## **Carbon Undergraduate Research Fellowship**

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

## **Carroll and Adelaide Johnson Scholarship**

The Carroll and Adelaide Johnson Scholarship offers rising juniors opportunities to conduct a two-year research project, under the mentorship of a Loyola faculty member, that addresses a social justice issue focused on women and/or gender.

## **Center for Urban Research and Learning (CURL) Fellowship**

CURL offers fellowships for undergraduate students interested in participating in community research projects with community organizations.

## **College of Arts and Science Summer Research Experience**

The College of Arts and Sciences (CAS) Undergraduate Summer Research Experience was designed to foster engaging, high-impact, faculty-mentored research experiences for CAS undergraduate students early in their academic careers (i.e., the summer following either the freshman or sophomore years). This program is a 4-week research immersion to introduce students with little or no prior experience in hands-on research under the mentorship of CAS

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faculty. Fellowships will be awarded across three broad CAS research areas: Basic Sciences, Humanities, and Social Sciences.

### **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.

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

The CCIH fellowship offers an academic-year research fellowship to undergraduate students enrolled in the Catholic Studies Minor program. This fellowship supports CCIH-funded faculty research projects, as well as CCIH's international research projects.

### **John Grant Fellowships for Research in Bioethics**

Starting in spring semester 2022, the John Grant Endowment for Health Care Ethics will be offering 3 research fellowships in bioethics. These fellowships will be awarded to undergraduate students who propose a research plan to work with a faculty member or doctoral student on a project of their choosing that relates to health care, bioethics, human health and the environment, human or animal research, biotechnologies, or any other bioethics-related topic.

### **Mulcahy Scholars Program**

The Mulcahy Scholars Program is designed for College of Arts and Sciences majors in the hard sciences, who are interested in working on individual projects with faculty mentors, or serving as a research assistant for ongoing faculty projects throughout the academic year.

### **Provost Fellowship for Undergraduate Research**

The Provost Fellowship, housed in the Center for Engaged Learning, Teaching, and Scholarship (CELTS), is designed for undergraduate students in any academic discipline who are interested in either establishing an individual project with faculty mentor oversight or working with a faculty member on their ongoing research as a research assistant. This opportunity may be a summer or an academic-year research project.

### **Research Mentoring Program**

The Research Mentoring Program is designed to partner graduate students who are working on dissertation research with undergraduates who are interested in participating in research and pursuing graduate education. This opportunity is a summer research project.

### **Ricci Scholars Program**

The Ricci Scholars Program provides highly qualified students scholarships to conduct research during a junior year of study at the Loyola campus in Rome, Italy, during Fall Semester and a

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destination in Asia during Spring Semester. The two Ricci Seminars, UNIV 301 and UNIV 302, are Engaged Learning courses. Applications are in the fall of Sophomore Year.

### **Rudis Fellowship Program**

The Rudis Fellowship is a research scholarship program throughout the academic year for students whose research focuses on the comparative study of constitutions.

### **School for Environmental Sustainability (IES) Undergraduate Research Fellowship**

This fellowship provides both summer and academic year research projects for students interested in researching urban environmental issues.

### **Social Justice Research Fellowship**

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

### **Women in Science Enabling Research (WISER)**

The WISER program is a summer research program designed for undergraduate women seeking to work with specific faculty in the sciences on their ongoing research.



*Preparing people to lead extraordinary lives*

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# Research and Engagement Poster Presentations:

## Session 1

11:00 AM - 12:30 PM

### ◆ Poster 1 ◆

#### ***Photolysis of Halogenated Flame Retardants Catalyzed by Plastics in Aqueous Solution***

Presented By: Nikolas Jeffries; Mulcahy Scholars Program

Supported By: Dr. M. Paul Chiarelli, Xiomara Martinez, Department of Chemistry

Plastic debris is accumulating in the environment. It is known that plastics can absorb water pollutants of limited solubility and transfer them to aquatic organisms which results in their premature death. Such pollutants such as halogenated flame retardants can undergo photolysis reactions in aquatic natural environments. The goal of our research is to investigate if different plastics can enhance the photolysis rate of these emerging contaminants in aqueous solution.

### ◆ Poster 2 ◆

#### ***Internship in Bioarchaeology & Forensic Anthropology: Bones!***

Presented By: Alicia Martinez

Supported By: Dr. Anne L. Grauer, Department of Anthropology

My presentation demonstrates how human remains and skeletal analysis tell us a great deal about the individual, such as determining age at death, sex, stature, population affinity, trauma, and disease. The goal of my internship is to use techniques learned in class (Human Osteology) to assist The Field Museum of Natural History and the Cook County Medical Examiner's Office. I am sharing what I learned through analysis of the Rush Medical Collection, historical background, and potential for repatriation. Reflection upon my experience working with forensic anthropology cases will also be detailed.

### ◆ Poster 3 ◆

#### ***Museum Conservation in the May Weber Ethnographic Collection***

Presented By: Leah Swan

Supported By: Dr. Catherine Nichols, Department of Anthropology

My presentation will be on my work in the May Weber Ethnographic Collection at Loyola. This will include the different skills I've learned for museum conservation work in my internship. I will detail the steps for creating a catalog record for an object, answer what an inventory is and

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why it is important, provide some of my experience organizing the archival records, and show how I create storage solutions for archival rehousing.

◆ **Poster 4** ◆

***Father Grollig Legacy Collections Project***

Presented By: Sophea Brandley, Joanna Ruiz

Supported By: Dr. Christopher Hernandez, Department of Anthropology

Loyola's Anthropology Department was founded in 1959 by Father Grollig who traveled the world collecting artifacts and promoting a Jesuit education. Despite amassing a rich inventory, his collection is not well documented, nor are much of his career efforts and personal life. To address these issues, we will discuss our legacy collections project, which involves archival research and artificial intelligence to learn more about Father Grollig in an effort to provide greater context information for his collection and the foundational role played by Father Grollig in the Loyola community. Our research also emphasizes the importance of doing legacy and collections based research, which is an often neglected aspect of archaeology.

◆ **Poster 5** ◆

***Clonal Analysis of Rib Mutants in Follicle Cells of Drosophila Ovaries***

Presented By: Grace Flemming; Mulcahy Scholars Program

Supported By: Dr. Jennifer Mierisch, Department of Biology

The protein Ribbon (Rib) has been identified as a novel transcription factor in the somatic follicle cells of *Drosophila* ovaries. During the process of oogenesis, follicle stem cells replicate and mitotically divide to form a protective epithelial sheath around the developing oocyte and nurse cells. This study examined the role of the mutant rib through clonal analysis and RNAi to determine whether the mutation provided any advantage or disadvantage in the development of the oocyte and mature egg in female ovaries of *Drosophila melanogaster*.

◆ **Poster 6** ◆

***Exploration of Antibiotic Resistance in Aerococcus Species***

Presented By: Natalie Stegman; Mulcahy Scholars Program

Supported By: Dr. Catherine Putonti, Department of Biology

Within microbial communities, interacting members can have negative or positive effects on each other, thus impacting the overall community composition. Temperate phages are believed to play a central role in regulating the composition of microbial communities as they are ubiquitous regardless of the ecosystem. We will explore whether *Lactobacillus* causes temperate phage induction in *E. coli* within the urinary microbiota. The *Lactobacilli* cell-free supernatant will be grown with the given *E. coli* strain and then its growth will be measured. If its growth is smaller than the control, that pair will be investigated further.



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◆ Poster 7 ◆

***The Genetic Contributions to Chronotype and Sleep Duration***

Presented By: Grace Chilton; Biology Summer Research Fellowship; Mulcahy Scholars Program  
Supported By: Dr. Heather Wheeler, Department of Biology

Genome Wide Association Studies, GWAS, are a statistical method employed to determine which single nucleotide polymorphisms, SNPs, are significantly related to complex traits. Unfortunately, studies involving African origin populations are scarce. The Pan-UK Biobank project has made public their multi-ancestry GWAS results across 6 different ancestral groups, including Africa. Included in the Pan-UK Biobank is information regarding chronotype and sleep duration. An individual's chronotype is the time of day that they are naturally inclined to sleep. Utilizing GWAS summary statistics contained in the Pan-UK Biobank, we can examine the relationship between significant genes and an individual's chronotype and sleep duration.

◆ Poster 8 ◆

***Studying Conserved Expression of Vertebral Formation During Zebrafish Development***

Presented By: Angelina Carcione, Â Baraa Hussein; Mulcahy Scholars Program  
Supported By: Dr. Rodney Dale, Department of Biology; Antonia Madonia, Department of Biology

The Collagen type II alpha 1 (Col2 $\alpha$ 1) gene, located on chromosome 12 in humans, is an important factor in the development of cartilage, notochord, skin, floor plate, brain, and heart in numerous vertebrates. Col2 $\alpha$ 1a has a highly conserved exon known as exon 2. Exon 2 is solely utilized during embryogenesis. In exon 2 is a Willebrand Factor domain, more specifically, the Willebrand Factor Type C (VWF-C) domain. The job of this domain is to regulate the Bone morphogenetic protein (BMP) found in the extracellular space. BMPs are a family of proteins that regulate cartilage and bone development in both the embryo and adult. We believe that the removal of this exon will have a severe impact on the VWF-C factor by completely removing it, which will most likely have an impact on the development of these embryos. Before that, steps must be taken before to make sure we are able to use CRISPR. These steps include overexpressing the VWF-C domain to study its impact on the formation of BMPs and how that will affect organ formation in the zebrafish. We anticipate that this overexpression will lead to an increase of BMPs which will subsequently lead to a change in the expression of the notochord and craniofacial areas. After this crucial step has been executed, we will then move to the main aspect of our project, the removal of exon 2 via CRISPR-Cas9. Since we expect this removal of exon 2 to have a severe impact on embryonic formation, we will also be looking for lethality.

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◆ Poster 9 ◆

***Microplastic Dynamics in Urban Streams: Influence of Site and Habitat Zone***

Presented By: Audrey Eros, Jaden Nguyen; Provost Fellowship

Supported By: Dr. Tim Hoellein, Department of Biology

Microplastic (<5mm) pollution is ubiquitous worldwide. The distribution of plastic particles in freshwater tributaries is patchy showing an accumulation of particles in depositional zones, which have naturally occurring fine particles. Microplastics may be sorted by density; denser particles in the sediment and less dense particles on the water's surface. The purpose of this study is to determine the spatial distribution of microplastic by polymer type in 3 river habitats: surface water, water column, and benthic. This study also determines the effects of storms on plastic pollution. samples were taken before, during and after storm events.

◆ Poster 10 ◆

***Degraded Frequency Map and Reduced Isofrequency Band Precision in the Cochlear Nucleus of Ephrin-B2 Mutant Mice***

Presented By: Cole Gebert, Christopher Nasios; Interdisciplinary Research Fellowship, Mulcahy Scholars Program, CAS Summer Research Fellowship

Supported By: Dr. Wei-Ming Yu, Department of Biology

Ephrin-B2 is expressed in the cochlear nucleus and may play a role in establishing isofrequency bands during frequency map formation. We compared the precision of topographic inputs of primary auditory neurons and isofrequency band precision between control and ephrin-B2 mutant cochlear nuclei. Using fluorescent dye labeling and pure tone sound stimulation followed by neuronal c-fos activation assays, we found that both primary auditory neuron inputs and isofrequency bands become less precise in ephrin-B2 mutants. Our study suggests that ephrin-B2 may regulate isofrequency band formation in the auditory system.

◆ Poster 11 ◆

***Quantifying Biofilm Formation in Evolved Planktonic and Biofilm-Forming Populations of Burkholderia Cenocepacia in Carbon-Limited Media***

Presented By: Katherine Jemian

Supported By: Dr. Caroline Turner, Department of Biology;  
Heather Blasius, Department of Biology

Burkholderia Cenocepacia, a pathogenic bacterium to patients with Cystic Fibrosis, forms a thick biofilm which aids adherence to the lungs' thickened mucosa. This debilitates patients' ability to breathe effectively, enhancing the risk of chronic illness and mortality. Bacterial populations were established from a single population isolate and experienced approximately 500 generations of evolutionary selection in carbon-limited media for biofilm and planktonic-selected biofilm

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growth. In the lab, we quantified the amount of biofilm produced by evolved populations of *Burkholderia Cenocepacia* using spectroscopy and calculated the analysis of variance. We found a significant biofilm growth difference between planktonic and biofilm-forming populations.

◆ **Poster 12** ◆

***Genetic Variation in Fat Depot Weights is Diet- and Sex-Dependent in Mice***

Presented By: Nafia Naila

Supported By: Dr. James Cheverud; Fernando Oliveira; Betsi Burns

The epidemic of obesity has been affecting individuals globally, with roughly 650 million adults obese in 2016 (WHO, 2021). According to the Centers for Disease Control and Prevention (CDC), obesity increases the risk of multiple life-threatening diseases such as stroke, high blood pressure, coronary artery disease, and overall results in a reduced standard of living. In this study, we manipulate animals' diets with isocaloric high- (42% of kcals from fat) and low-fat (15% kcals from fat) diets. Here we report on the genetic basis for variation in fat depots, in levels of sexual dimorphism, and in dietary response.

◆ **Poster 13** ◆

***Examining the Habitat Use, Home Range, Hibernacula, Nesting, and Thermal Ecology of Spotted Turtles (*Clemmys guttata*) in and adjacent to Northern Indiana Public Service Company Property in Northwestern Indiana***

Presented By: Haydn Notario; Mulcahy Scholars Program; CAS Summer Research Fellowship

Supported By: Dr. Joseph Milanovich, Department of Biology

The Spotted Turtle is a small semi aquatic omnivore that lives in various freshwater environments, such as bogs, ephemeral wetlands and upland terrestrial habitats. Spotted turtles have disjunct populations in northwest Indiana. This region was industrialized in the late 19th century, leading to polluting, splintering, and damage of surrounding ecosystems.(Bowles, 1990; Perkins et al., 2000). Because of this, it is important to understand the habitat use, home range size, thermal ecology, hibernacula locations and phenology of hibernation accent/descent. To do this, we used radio-telemetry, GPS technology, and the program ArcMap to quantify habitat use and home ranges of turtles in two populations of northwest Indiana. These data will provide ecological data necessary to identify sensitive areas for this species, allowing for safe development of the region.

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◆ Poster 14 ◆

***Anthropogenic Litter Abundance and Composition in Urban Streams: Influence of Site and Habitat***

Presented By: Olivia Schaul, Thomas Crabtree, Jess Von Brugger; Biology Summer Research Fellowship; Mulcahy Scholars Program

Supported By: Dr. Timothy Hoellein, Department of Biology; Elizabeth Kazmierczak

Anthropogenic litter (AL; trash including plastic and other materials) is a global ecological concern. Rivers move AL from land to oceans, but the distribution of AL within rivers is less often studied. We examined the abundance and composition of AL in different habitats at multiple sites in an urban river. We expect sorting of AL based on density, and that sites with greater urban land use will have the most AL. These data will be helpful to improve AL mitigation and removal strategies.

◆ Poster 15 ◆

***Determining the Relative Fitness of E. Coli Populations Evolved in Carbon-Limited or Nitrogen-Limited Media in the Presence of Ampicillin***

Presented By: Alexa Schnell

Supported By: Dr. Caroline Turner, Department of Biology

Better understanding the means by which bacteria acquire antibiotic resistance is a critical public health priority. We sought to determine the effect of environmental conditions on the evolution of antibiotic resistance, investigating the impact of carbon-limited or nitrogen-limited liquid media on the experimental evolution of Escherichia coli under the selection pressure of ampicillin. Differences in fitness between ancestral E. coli and evolved populations were measured via a fitness competition in which we mixed the populations within the same flask, forcing them to compete for resources.

◆ Poster 16 ◆

***Quantifying Plumage Ornamentation in Spotted Sandpipers Using ImageJ.***

Presented By: Kanishka Singh; Biology Research Fellows Program

Supported By: Dr. Sara Lipshutz, Department of Biology

Spotted Sandpipers (*Actitis macularius*) are a bird species named for their spotted chest feathers. Previous study of a Midwestern population found that females exhibit greater feather ornamentation than males. We photographed the plumage of a California population. We used Image J, to analyze the number of spots and the average spot area, to evaluate the degree of sexual dimorphism. Preliminary results suggest there is a correlation between the ornamentation of the Spotted Sandpiper and the sex of the bird, indicating that plumage ornamentation can be used to determine the degree of sexual dimorphism.

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◆ Poster 17 ◆

***Expression of Eph Receptors in the Cochlea and Cochlear Nucleus***

Presented By: Alice Yen, Victoria F. Dippold; Mulcahy Scholars Program; Provost Fellowship  
Supported By: Dr. Wei-Ming Yu, Department of Biology

Sound travels to the brain through spiral ganglion neurons (SGNs) in the cochlea, which transmit information to the brainstem cochlear nucleus in a frequency-based pattern. Ephrin-A3 and ephrin-B2 molecules are involved in this mapping. To explore which Eph receptors mediate ephrin-A3 and/or ephrin-B2 effects, we conducted in situ hybridization to examine Eph expression. We found that EphA4, EphA7, EphB3, and EphB4 are expressed in the cochlea, while EphB1 and EphB2 are expressed in the cochlear nucleus, indicating that they may mediate ephrin-A3 and/or ephrin-B2 signaling.

◆ Poster 18 ◆

***The Effects on Enzymatic Activity and Thermostability of the H178C Mutation on Î²-glucosidase (BglB) Protein***

Presented By: Nick Alejandro, Alexander Zacharuk  
Supported By: Dr. Emma Feeney, Department of Biology

The purpose of this project is to contribute data to the Design to Data (D2D) database, which aims to create software to predict protein functionality. We will be analyzing our mutant enzyme through a series of experiments that will look at the enzymatic activity and thermostability in comparison to the wild type enzyme. We hypothesize that B-glucosidase (BglB) mutant H178C will demonstrate decreased catalytic efficiency and thermal stability in comparison to the wild type because its overall Foldit score suggests a lower likelihood of expression, despite having minimal effect on local hydrogen bonds and hydrophobic interactions.

◆ Poster 19 ◆

***Analysis and Characterization of B-GlucosidaseB Mutant T13S***

Presented By: Timea Both Rayyan Hyder  
Supported By: Dr. Emma Feeney, Department of Biology

The purpose of this research project is to analyze the thermal stability and enzymatic kinetics of Î²-GlucosidaseB mutant T13S. We hypothesized that Î²-Glucosidase (BglB) mutant T13S will demonstrate a decreased catalytic efficiency and thermal stability in comparison to the wild-type, because its overall Foldit score suggests a decreased energy score. Data was collected using enzyme kinetic and thermostability assays in order to test the hypothesis.

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◆ Poster 20 ◆

***In-Depth Design to Data Analysis of Amino Acid Mutation N163T (Asparagine163Threonine) of pET29b BglB E.Coli Gene***

Presented By: Parker Fett, Luca Egleston

Supported By: Dr. Emma Feeney, Department of Biology

I hypothesize that Î²-glucosidase (BglB) mutant N163T will demonstrate the same catalytic efficiency and thermal stability in comparison to the wild type because its overall Foldit score suggests expression is a high likelihood, and intermolecular modeling analysis (local score) also points to similar local interactions. Furthermore, previously published data on the same mutation N163T supports this hypothesis.

◆ Poster 21 ◆

***Characterizing the Catalytic Efficiency and Thermostability of the A80S BglB mutation***

Presented By: Madi James, Savannah Moser

Supported By: Dr. Emma Feeney, Department of Biology

Our purpose was characterization of the A80S Î²-glucosidase B (BglB) mutation compared to wild type BglB enzyme. We hypothesized that A80S BglB will demonstrate decreased catalytic efficiency and similar thermostability compared to the wildtype BglB protein because its overall Foldit score suggests expression is less likely and the local score indicates increased local interactions, specifically hydrogen bonds, which will deter substrate binding. Furthermore, previously published data from the D2D database on similar mutations, A88K BglB and I91K BglB, supports this hypothesis. We will test this hypothesis using enzyme kinetic assay, thermal stability assay, SDS PAGE, and Western Blot.

◆ Poster 22 ◆

***An Analysis of the Enzymatic Activity and Thermostability of Beta-glucosidase-B Mutation Y118F***

Presented By: Katarina Maier, Danielle Buendicho

Supported By: Dr. Emma Feeney, Department of Biology

We are analyzing the BglB mutation Y118F in conjunction with a laboratory partnership with UC-Davis's Seigel laboratory. The purpose of this is to examine the influence that an amino acid change from tyrosine to phenylalanine at the 118th amino acid location would have on the thermostability and enzymatic activity of this enzyme, using a thermostability assay and kinetic assay. We expect that this change would have very little influence on the thermostability and enzymatic activity due to tyrosine and phenylalanine having similar amino acid characteristics.

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◆ Poster 23 ◆

***Analysis of the Effects of H328N Mutation on Beta-Glucosidase B Catalytic Efficiency and Thermostability***

Presented By: Camryn Martin, Hamza Husein

Supported By: Dr. Emma Feeney, Department of Biology

This research project is a contribution to the Design2Data (D2D) database. Based at UC Davis, D2D is a nationwide project with the goal of teaching an AI system to predict protein function based on structure using data from hundreds of Beta-Glucosidase B (BglB) mutants. We analyzed the histidine to asparagine mutation at position 328 through kinetic and thermostability assays, as well as SDS-PAGE and Western blotting to assess purity. Preliminary modeling using Rosetta software suggests the H328N BglB mutant will have little difference when compared to the wild-type enzyme.

◆ Poster 24 ◆

***Characterization of Enzymatic Activity and Thermostability of Î²-Glucosidase B (BglB)-Histidine-328-Asparagine for D2D Database Contribution***

Presented By: Eliza Wszolek, Maggie Rivas

Supported By: Dr. Emma Feeney, Department of Biology

The purpose of this research was to analyze the differences between Î²-glucosidase (BglB) wild-type enzyme and BglB-Histidine-328-Asparagine (H328N). We hypothesized that this mutation will demonstrate decreased catalytic efficiency and thermostability in comparison to the wild-type because of a change in Rosetta scores, shown by an overall energy increase. We based our assumption off of the results we obtained from Foldit, a mutation simulation program. Further testing through enzymatic and thermostability assays will give us more information on the mutation.

◆ Poster 25 ◆

***Measuring the Enzymatic Activity and Thermostability of T13S Mutant BglB Enzyme***

Presented By: Hannah Yun, Anya Agarwal

Supported By: Dr. Emma Feeney, Department of Biology

Î²-glucosidase B (BglB) is an enzyme essential in breaking down cellulose in bacteria and fungi via the hydrolysis of the Î²-1,4-glycosidic linkage in cellulose, yielding glucose monosaccharides. Our project is focused on determining the enzymatic effects of the T13S mutant BglB enzyme compared to wild-type BglB, along with observing BglB's activity at different temperatures. We hypothesize the mutant will exhibit only slightly decreased enzymatic activity given a similarity between Threonine and Serine structure and based on FoldIt's

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protein modeling. We have tested this by running a western blot and utilizing thermal stability and enzymatic assays.

◆ Poster 26 ◆

***Characterizing T352V Mutation in the Enzyme Î²-Glucosidase B to Contribute Data to Improve Protein Modeling Software***

Presented By: Brendan Crawford, Jenny Huyler

Supported By: Dr. Emma Feeney, Department of Biology

A current goal of biochemistry is to develop software to predict protein function. We have characterized a T352V mutant of the enzyme Î²-Glucosidase B in order to contribute data to protein function predicting software. We have achieved this through expressing the mutant enzyme in bacteria, and gathering data about the mutated enzyme by performing kinetic and thermostability assays, as well as SDS PAGE and Western blotting. We hypothesize that T352V mutant Î²-Glucosidase B will demonstrate decreased catalytic efficiency compared to the wild type because of the change in local interactions due to the mutation, including the new presence of hydrophobic interactions and lack of hydrophilic interactions near the catalytic site.

◆ Poster 27 ◆

***Geographic Variation and Species Composition of the Zeiform Fish Parazen***

Presented By: Hannah Corcoran

Supported By: Dr. Terry Grande, Department of Biology

Parazen pacificus is a ray-finned fish belonging to the family Parazenidae and the order Zeiformes (Dories). It is a deep-water fish with a geographic locality ranging throughout the Atlantic, Pacific, Indian, and Caribbean oceans. Traditionally Parazen is thought to be monotypic (i.e., containing only one species), but preliminary research suggests that different species inhabit different geographic locations. This project, by means of 2-D morphometrics and meristic measurements, investigates morphological variation among Parazen fishes collected from all recorded oceans to gain insight into the geographic variation of this fish, and whether or not all Parazen constitutes more than one species.

◆ Poster 28 ◆

***The Impact of Evolutionary History and Nutrient Limitation on LTEE E. coli Strains***

Presented By: Marissa Donofrio

Supported By: Dr. Caroline Turner, Department of Biology

Increasing antibiotic resistance is an important issue that impacts health and wellness. In a long-term evolution experiment, it was found that Escherichia coli grown in the absence of antibiotics over multiple generations were less resistant than their ancestors. We conducted minimal



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inhibitory concentration tests with different antibiotics to test how evolutionary history and nutrient limitation affect antibiotic resistance. We found that evolutionary history does impact resistance but nutrient limitation does not.

◆ Poster 29 ◆

***Shared Stem Cells in the Zebrafish Caudal Body and Fin***

Presented By: Andrew Locke Zil Barot, Marwan Hamadeh, Nohara Nano, Esam Shah, Allison Watts, Paula Martin, Fred Pickett; Biology Summer Research Fellowship; Mulcahy Scholars Program

Supported By: Dr. F. Bryan Pickett, Department of Biology

The tail region of many bony fish (teleosts), including the Zebrafish, is composed of the "caudal peduncle" including the bone, blood vessels, muscle and nerves associated with the caudal spinal column, and the caudal fin, a specialized organ of movement including mostly bone, blood vessels and nerves. The developmental origin of the structures of the fin and caudal peduncle is unknown. Our project uses genetic mosaics to track patterns of cell sharing between structures in the peduncle and the fin. Our preliminary data indicates that bone, blood vessels and nerves from both anatomical compartments share a common cellular origin.

◆ Poster 30 ◆

***Investigating the Role of Tricornered in Glial Development and Function in Drosophila Melanogaster***

Presented By: Daniel Martinez; CURA Scholars Program

Supported By: Dr. Jennifer Mierisch, Department of Biology

Understanding the signaling pathways responsible for establishing and maintaining glial structure and number is essential for reducing nervous system disorders. Our lab has identified Tricornered (Trc) as a protein of interest in the regulation of glial development. Knockdown of *trc* leads to an overall reduction in the amount of glia in the eye imaginal disc of *D. melanogaster*; however, the effects of glial subpopulation-specific Trc downregulation on gliogenesis is unknown. My project has focused on the effect of knocking down in each of the glial subpopulations to determine where Trc is required to promote glial development in the developing eye.

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◆ Poster 31◆

***The Role of Ribbon and Notch Genes in Spermatogenesis of Drosophila Melanogaster***

Presented By: Allyson Terrell; Mulcahy Scholars Program

Supported By: Dr. Jennifer Mierisch, Department of Biology

Spermatogenesis is essential for the production of sperm for sexual reproduction. Defects in this process can lead to infertility. In order to understand the basis of infertility it is necessary to identify and characterize the genetic mechanisms that promote sperm development. My research has been focused on discovering the relationship between the gene Notch, and the transcription factors ribbon and hindsight. Our experiments suggest that Notch regulates hindsight and may have an antagonistic relationship with ribbon. We plan to further explore the relationship between Notch, Ribbon and Hnt to better understand how these genes and their mammalian homologs promote spermatogenesis.

◆ Poster 32 ◆

***Developing and Optimizing RNA Isolation Methods from Avian Tissue Samples***

Presented By: Isabella Zent, Marcus Piattoni

Supported By: Dr. Sara Lipshtuz, Department of Biology; Quinn Thomas, Department of Biology

Investigating tissue-specific gene expression first requires RNA isolation. This research seeks to develop and optimize multiple methods of RNA extraction from blood and gonadal tissues in several different avian species, including house sparrows (*Passer domesticus*) and northern jacanas (*Jacana spinosa*). Method variations include RNAlater vs. flash freezing tissue, homogenizer vs. bashing beads, phase separation vs. Zymo kit, and various temperature and time settings for incubation. Establishing effective methods for avian investigation of RNA will allow us to research how differential gene expression relates to phenotypic behaviors.

◆ Poster 33 ◆

***Predicting the Consequences of Global Climate Change on Aquatic Snakes in the Midwest***

Presented By: Ella Janson; Mulcahy Scholars Program

Supported By: Dr. Joseph Milanovich, Department of Biology; Jess Lindberg, Department of Biology

Aquatic snakes are a diverse group of reptiles in the Midwest. Localized extinctions and an increase in the number of threatened and endangered species amidst global climate change are of increasing concern, especially in the context of species distribution. Therefore, we used Species Distribution Models (SDMs) to quantify distributional changes for aquatic snake species in the Midwest. Several distributions were created by modeling three decades along with two global circulation models with two CO<sub>2</sub> outputs per GCM. These data show large changes in the

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distribution of aquatic snake species across the Midwestern United States, emphasizing the importance of further study.

◆ Poster 34 ◆

***Klebsiella Pneumoniae Bacteriophage Characterization and Analysis***

Presented By: Noah Zuniga; Biology Summer Research Fellowship; Mulcahy Scholars Program  
Supported By: Dr. Catherine Putonti, Department of Biology

*Klebsiella pneumoniae*, a Enterobacteriaceae bacteria, is an emerging health issue that has become rampant within the recent years due its resistance to common antibiotics and virulence factors, which has increased in recent years. Demonstrating the need for alternative approaches to antimicrobial treatment, a plausible approach is bacteriophages and their potential use in phage therapy. Here, we present a temperate *K. pneumoniae*-infecting bacteriophage named Costanza. The information gained will add to the expanding knowledge of phages and their interaction with Enterobacteriaceae, as well as future prospects for phage therapy tailored toward *K. pneumoniae* infections.

◆ Poster 35 ◆

***Knockdown of Hedgehog Signaling Pathway Contributes to Midline Craniofacial Development and Facial Elongation in the Lizard Anolis Sagrei***

Presented By: Naaz Khan, Greta Keller, Rushabh Shah; Biology Research Fellows Program; Mulcahy Scholars Program  
Supported By: Dr. Thomas Sanger, Department of Biology; Dr. Marta Marchini, Department of Biology

This project aims to explore the role of Hedgehog signaling in craniofacial development in the lizard *Anolis sagrei* as there is a gap in knowledge regarding craniofacial development of lizards. We hypothesized that inhibition of Hedgehog signaling in *A. sagrei* will result in disrupted formation to the midline facial structures, specifically the premaxilla. Stage matched embryos were administered different concentrations of the chemical cyclopamine to knock down signaling at different stages. We acquired frontal and lateral microscopic and micro-CT scanned images to assess morphology. The next phase of our experiment includes in-situ experiments to detect RNA expression of Hedgehog signaling.

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◆ Poster 36 ◆

***Crosstalk Between TAMs and Glioblastoma Stem-Like Cells in a Hypoxic Microenvironment Induces Quiescent Arrest and Enhanced Radioresistance***

Presented By: Victor Karwacinski

Supported By: Dr. D. Megan Helfgott, Department of Biology, Dr. Tatiana Correa Carneiro-Lobo

Patients with glioblastoma (GBM) have an overall survival of 15 months despite current treatment modalities. This study aimed to understand how GSCs repopulate the tumor and how hypoxia and TAMs (tumor-associated macrophages) affect this process. A GBM-brain cortical organoid (BCO) was used to model human GBM and found that hypoxia increased TAMs influx into GBM-BCOs and enhanced the enrichment of CD133+ GSCs. TAMs also promoted the radioresistant phenotype and quiescent cell population of GBM neurosphere cultures under hypoxic conditions. These findings suggest that hypoxia-TAMs-GSCs interactions promote tumor oncogenesis and hinder the anti-tumor response, highlighting the need for new therapeutic avenues.

◆ Poster 37 ◆

***The Phenotypic Variation of Natural Killer Cells and Killing Capacity of Allogeneic Donor Stem Cells***

Presented By: Zachary Pitsenberger

Supported By: Dr. Jenifer Mierisch; Department of Biology Dr. Aimen Shaaban; Director of Chicago Institute for Fetal Health, Dr. Hee kap Kang; Chicago Institute for Fetal Health

A large problem with Stem cell transplantation is the gradual rejection of donor cells. Prenatal transplantation induces lifelong stable tolerance towards donor stem cells within the recipient. In this study, chimera mice were created through In-Utero Hematopoietic Stem Cell Transplantation. It was found that engrafter offspring maintain an increased level of friendly NK cells when compared to naïve mice. Assays were performed to measure the cytotoxicity levels of friendly NK and hostile NK cells upon encountering donor cells or tumor cells. Testing demonstrated that friendly NK cells will elicit tolerance towards allogeneic donor cells while maintaining their intrinsic killing functions.

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◆ Poster 38 ◆

***Investigating the Role of TANK-Binding Kinase 1 (TBK1) in MLL-AF9+ Acute Myeloid Leukemia***

Presented By: Allan Youmaran

Supported By: Dr. Jiwang Zhang; Austin P. Runde, MS Student in Cellular and Molecular Oncology; Fr. Peter Breslin, SJ; Department of Cancer Biology, Oncology Institute, Cardinal Bernardin Cancer Center, Loyola University Medical Center

Sustained remission of acute myeloid leukemia (AML) is negated by the proliferation of leukemia stem cells (LSCs) that survive first-line chemotherapy. Thus, there is a dire need for additional, LSC-specific therapies that can help prevent relapse. TBK1, a serine/ threonine kinase, has been implicated in the pathogenesis of AML, possibly due to its ability to promote MYC activity and FLT3 expression. Additionally, high TBK1 mRNA expression has been associated with a reduced probability of AML survival. We hypothesize that TBK1 inhibition could antagonize the stem-like characteristics of LSCs, promoting their loss-of-function death and increasing the odds of achieving a cure.

◆ Poster 39 ◆

***Understanding Therapeutic Efficacy in Drug-Resistant Breast Cancer***

Presented By: Millie Martinez

Supported By: Fr. Peter Breslin, SJ; Department of Cancer Biology; Dr. Sean W. Fanning, Department of Cancer Biology

Breast cancer relies heavily on the estrogen receptor, but prolonged treatment can lead to mutations in ESR1, leading to resistance. My lab is studying how these mutations impact the receptor and developing small molecules to overcome resistance. Their latest discovery involves a drug-induced estrogen receptor structure that distinguishes between effective and ineffective treatments for the most severe ESR1 mutation. This semester, my project focused on understanding how drugs affect Y537S ER $\pm$ -SRC3 binding using a Nanobit glow assay. Y527S is a mutation that favors pathology without hormone activation and coactivator recruitment, making it resistant to drugs.

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◆ Poster 40 ◆

***Utilizing in Situ Hybridization to Understand the Role of Col2a1b Gene in Vertebrate Development***

Presented By: Mia Gabelev, Mansi Patel, Alex Tollefson; Biology Summer Research Fellowship; Mulcahy Scholars Program

Supported By: Dr. Rodney Dale, Department of Biology

Our laboratory is interested in understanding the role of Type II alpha 1 collagen (Col2a1) in vertebrate development. We utilize *Danio rerio*, the common zebrafish, to elucidate the function of the zebrafish version of this gene. Our goal is to visualize and locate the presence of the type II alpha 1 collagen b gene (col2a1b) in zebrafish. col2a1b's collagen expression occurs solely in the perichondrium, while its paralog, col2a1a, is expressed in chondrocytes and in the perichondrium. A goal of our project is to discover how the col2a1b gene maintains its expression in the perichondrium using in situ hybridization.

◆ Poster 41 ◆

***The Ephrin-B2 Signal Regulates Auditory Nerve Fiber Responses and Functions During Frequency Map Formation***

Presented By: Jakub Krasewicz, Shayma S. Smaoui, Julia K. Mansour; Biology Summer Research Fellowship; Mulcahy Scholars Program; Pizzi Fellowship

Supported By: Dr. Wei-Ming Yu, Department of Biology

The molecular mechanisms that regulate frequency map formation of neurons in the cochlear nucleus are not well understood. We investigate the role of ephrin-B2 and find that it is differentially expressed along the dorsal-ventral axis of the cochlear nucleus, suggesting a role in frequency map formation. Ephrin-B2 influences the trajectory of auditory nerve fibers, and its absence results in impaired central auditory circuitry and detection of sound frequency changes. Our results emphasize the importance of ephrin-B2 in regulating auditory nerve fiber trajectory during frequency map formation for accurate auditory functions.

◆ Poster 42 ◆

***Characterizing the T352V Mutation of Beta-glucosidase B (BglB)***

Presented By: Olivia Hodge, Renee Stanec

Supported By: Dr. Emma Feeney, Department of Biology

We performed this experiment to contribute data to the D2D Project, which seeks to determine if enzymatic function can be predicted based on the primary structure of an enzyme (Beta-glucosidase B/BglB). To make this prediction, a T352V mutation for BglB was created. We hypothesized that BglB T352V mutation will demonstrate decreased catalytic efficiency and/or thermal stability compared to wild-type because increased local and overall scores signify that

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BglB has become less stable. In this experiment, we prepared and purified plasmid containing mutated Bgl-B gene, expressed and purified BglB, and performed enzymatic assays to determine catalytic efficiency of the mutant T352V Bgl-B.

◆ **Poster 43** ◆

***Characterizing & Analyzing BglB Enzyme with Mutation T352V To Assess Function***

Presented By: Victoria Szelepinski, Zareen Syed

Supported By: Dr. Emma Feeney, Department of Biology

The goal of this research was to characterize mutant enzyme BglB's function. We hypothesize that BglB mutant T352V will demonstrate decreased catalytic efficiency versus wild type. This is due to the mutation's hydrophobic properties that alter local interactions with nearby hydrophilic amino acids and because of the increase in the Rosetta score. Furthermore, previously published data on a similar mutation T352A supports this. With similar properties of alanine and valine, it can be hypothesized that the reduction in T<sub>m</sub> seen in the T352A mutation will also be seen in mutant T352V. We analyzed BglB function through kinetic and thermostability assays.

◆ **Poster 44** ◆

***To the Moon: Social Media Sentiment and Stock Price Analysis***

Presented By: Jack Armanini, Benton Scott, Kevin Alexander

Supported By: Dr. Anne Reilly, Quinlan School of Business, Management

Social media sentiment-based analysis has seen increased research, most of which has been inconclusive, as the predictive capability has been mixed. In this study, we analyzed social media sentiment data on Refinitiv and tested it against a basket of stocks from the S&P 500. We looked to see a general correlation and comparison to price changes using this collected data. Finally, we introduce our conclusion regarding whether social media sentiment is a leading, lagging, or coincident indicator. Overall, results were inconclusive, implying the need for future, more detailed, and time-consuming research in the area.

◆ **Poster 45** ◆

***Characterizing the Double Mutation R75A/Y124A and its Role in the Allosteric Regulation of ADP-Glucose-Pyrophosphorylase from Agrobacterium Tumefaciens***

Presented By: Gina Canavan; Mulcahy Scholars Program

Supported BY: Dr. Ballicora, Department of Chemistry; Gaby Martinez-Ramirez, Department of Chemistry and Biochemistry

ADP-glucose-pyrophosphorylase (ADP-Glc PPase) is the regulating enzyme of starch synthesis in plants and glycogen synthesis in bacteria. This project explores the characterization of a double mutation in the allosteric site of the ADP-Glc PPase from *Agrobacterium tumefaciens*.

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The double mutation consists of arginine 75 mutated to alanine (R75A) and tyrosine 124 mutated to alanine (Y124A), which will be compared to each mutation individually. I hope to determine the effects of the double mutation on ADP-Glc PPase behavior, anticipating higher specific activity than the single mutations. This will provide insight in how to increase starch synthesis to produce biofuels and green energy.

◆ Poster 46 ◆

***Influence of Surface Area on Rate of Photolysis of Emerging Contaminants***

Presented By: Liz Perez; Mulcahy Scholars Program

Supported By: Dr. Paul Chiarelli, Professor, Department of Chemistry; Xiolmara Martinez, Department of Chemistry

Plastic debris in natural water can absorb persistent organic pollutants (POPs) and catalyze their transformation to other molecules. This study aims to determine how the surface area of plastic affects the rate of POP photolysis. Photolysis reactions of triclosan and methyl triclosan are being carried out in the presence of polyethylene particles ranging from 5 to 925  $\mu\text{m}$  in diameter and sheet plastic with a surface area of at least 10mm, which displays the highest degree of photolysis. The results will provide insight into plastic surface interactions and energy sharing with adsorbed molecules.

◆ Poster 47 ◆

***Thermodynamics of Antibody Affinity Maturation***

Presented By: Christina Starcevic; Provost Fellowship

Supported By: Dr Joerg Zimmermann, Chemistry

A relevant topic in society has become the role of antibodies in adaptive immunity especially in relation to the COVID-19 pandemic. Affinity maturation causes B cell receptors to mature from germline cells to mature and highly specific B cell receptors known as antibodies to assist in fighting the infection. The affinity to cognate antigen is increased through entropic destabilization of the antigen-free binding site and enthalpies stabilization of the complex of antibody with cognate antigen. Simultaneously, the specificity is increased via enthalpies destabilization of the complex of antibody to noncognate ligands. To test this hypothesis, we will use thermodynamic characterization of the germline and mature antibodies.



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◆ Poster 48 ◆

***Molecular Dynamics Simulations of the Interactions of Acetaminophen and Various Co-Crystallites***

Presented By: Lauren Thompson; Mulcahy Scholars Program

Supported By: Dr. Ken Olsen, Department of Chemistry and Biochemistry

To optimize the dissolution of drug molecules, various co-crystallites can be added to the molecule. We studied the interactions between acetaminophen and a variety of co-crystallites that alter the aggregation and dissolution of the crystalline form, specifically the co-crystals of citrate and oxalate. Using molecular dynamics simulations, we observed how these various structures of acetaminophen form in water, as well as how they formed in a vacuum.

Furthermore, we placed these molecules in a virtual box and observed how the crystal structure dissolved. We will use this data to predict the interactions and relative dissolution rates of these molecules.

◆ Poster 49 ◆

***Potential Enhancement of Microplastics on Emerging Contaminant Uptake in Zebrafish***

Presented By: Heba Hussain; Mulcahy Scholars Program

Supported By: Dr. M. Paul Chiarelli, Department of Chemistry

Plastic debris is widespread in aquatic environments. The goal of this study is to determine how the structural differences of the polymers in plastic will affect the transfer of polychlorinated biphenyls (PCBs) absorbed on the surface to zebrafish. We have exposed zebrafish to three types of plastic (polyethylene, polymethylmethacrylate, and polycellulose) to determine how the chemical structure of the plastic affects the uptake of PCBs by the fish. Fluorescence analysis shows that the fish do not retain a significant amount of plastic beads. We are analyzing zebrafish tissue to determine which plastic better transfers PCBs to the fish.

◆ Poster 50 ◆

***Literature Review on Youth Participatory Action Research***

Presented By: Sama Ahmadian, Rylee Abaya, Maura Bradesca, Emily Thachet

Supported By: Nora Wynn, School of Social Work

Our presentation looks at previous research done on mentorship experiences in participatory research in an urban setting and suggests programs that can be implemented to improve the academic environment for grade school students

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◆ Poster 51 ◆

***Phishing Vulnerabilities***

Presented By: Madeline Moran

Supported By: Dr. Eric Chan-Tin, Department of Computer Science; Dr. Loretta Stalans, Department of Criminology Department

Research conducted with the purpose of discovering who may be most vulnerable to phishing scams through a survey analyzing participants psychological profile and an emailed phishing campaign that recorded participants engagement with the scam.

◆ Poster 52 ◆

***Identifying Participant Roles in Cyberbullying Through Hierarchical Attention Networks***

Presented By: Patrick Furman; Mulcahy Scholars Program

Supported By: Dr. Yasin Silva, Department of Computer Science; Dr. Deborah Hall, Arizona State University

Cyberbullying is a widespread form of online harassment with serious negative consequences for victims. In a cyberbullying instance, participants can be classified as harassers, victims, or bystanders. Identifying the roles of participants in cyberbullying instances can facilitate more effective intervention in these instances. We propose a hierarchical attention network to automatically classify the roles of users in cyberbullying conversations on ASKfm, a social media platform where users can ask and answer questions anonymously. Our model combines word, sub-sentence, and sentence-level attention mechanisms to represent the structure of posts on the ASKfm platform and capture relevant features for classification.

◆ Poster 53 ◆

***Software Application Development for Remote Monitoring of a PrisMax Machine***

Presented By: Jordan Mullen, Kaitlyn Wacker, Amadeusz Rydzy

Supported By: Dr. Gail Baura, Department of Engineering; Dr. Tom Johnson, Department of Engineering; Matthew Bivans; Derek Neiman; Timothy Nadolski; Lauren Gartner

The need to be able to monitor a medical device remotely has been magnified due to the COVID-19 pandemic. Remote monitoring helps alleviate staffing shortages, reduce cost of care, and reduce the time a clinician spends in a patient's ICU room. Remote monitoring of a medical device needs to be accurate, secure, and reliable. The lack of a standardized approach causes operators to be unsure they are making sound medical decisions in a remote setting. The purpose of this project is to develop a software application to instill confidence in an operator to make medical decisions remotely.

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◆ Poster 54 ◆

***Residential Drainage Improvement Project, Rosedale Hills, IN***

Presented By: Lexie Nesbitt Jordan Lang, Connor Dreyer, Pietro Galante, Rowan Musick

Supported By: Dr. Jason Streeter, Department of Engineering; Dr. Tom Johnson, Department of Engineering; Dr. Gajan Sivandran; Dr. Ben Kravitz, PhD, Department of Engineering

This project will address chronic flooding issues in the Rosedale Hills neighborhood. Since the town's construction in the 1940s, stormwater has been met with insufficient solutions. Due to the insufficient infrastructure, large storm events result in floods, property damage, and obstruction of roadways. The HNTB group has tasked this Capstone group with finding the best solutions for this site in terms of effectiveness, cost, social disruption, ease of use, and environmental impact. Proposed improvements include the addition of French drains, Bioswales, and Porous pavement.

◆ Poster 55 ◆

***Climate Education***

Presented By: Evie Winebrenner, Abbey Haynes, Stephanie Udzielak, Charlotte Roos, Rachel María

Supported By: Dr. Tania Schusler, School of Environmental Sustainability

We aim to improve ecoliteracy. Through our own experiences studying environmental sustainability, we shared a common issue of not being able to clearly communicate about climate change with community members. We sought to address this by creating a syllabus for a course at Loyola University Chicago around how to educate others about climate change. To develop the course structure and content, we gathered knowledge from community experts in environmental education and researched what other schools have implemented in the environmental education field. Our product is a syllabus, learning outcomes, and rationale for a new course devoted to teaching Loyola undergraduates how to educate others about climate change in ways that enable people to help avert the climate crisis.

◆ Poster 56 ◆

***Supporting Mental Health for Students Experiencing Climate Anxiety and Environmental Racism***

Presented By: Stephanie Black, Selena Lynch, Valeria Monreal, Hanan Abdillahi, Hunter Robbins

Supported By: Dr. Tania Schusler, School of Environmental Sustainability

There has been growing discourse on climate anxiety and environmental racism. Minorities are disproportionately affected by climate change and we recognize the impacts that climate anxiety has on these populations. Our mission is to ensure every student feels supported in the advent of the climate crisis. We did so by inventorying resources at Loyola, building community

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engagement with these topics through surveys and interviews, and offering recommendations to faculty, staff, and administrators for how they can better support their students. We hope to persuade Loyola to offer more information and expand on resources for climate anxiety and environmental racism.

◆ Poster 57 ◆

***Gut Content Analysis of Invasive Amphipod, Apocorophium Lacustre, in Illinois Waterways***

Presented By: Alex Quebbeman

Supported By: Dr. Reuben Keller, School of Environmental Sustainability

Apocorophium lacustre, an aquatic amphipod commonly called scud, is an invader in Illinois waterways and poses a threat to food webs and native species. Little is known about the basic biology of scud, including their diet. Scud were collected from the Illinois River and their digestive tracts were removed and stained with DAPI, a dye that presents itself in various fluorescent colors depending on the type of organisms present. The samples are being analyzed under a fluorescence microscope to determine the percentage of bacteria, protozoa, algae, and detritus that scud eat.

◆ Poster 58 ◆

***Red Swamp Crayfish (Procambarus clarkii) Stress Levels in Polluted Water***

Presented By: Tava Oosterbaan

Supported By: Dr. Reuben Keller, School of Environmental Sustainability

Red swamp crayfish (Procambarus clarkii) is an invasive species established in the Chicago River. Prior research has shown that poor water quality increases metabolic stress levels for many organisms. I exposed red swamp crayfish to polluted water from the Brandon Road Lock and Dam and measured oxygen consumption using respirometry. Higher metabolic stress generates increased oxygen consumption. My results show that red swamp crayfish are not significantly affected by the polluted water. This finding is consistent with being a highly tolerant species found in a wide variety of habitats.

◆ Poster 59 ◆

***Residential Mobility and the Value of Water Quality Improvements in the Milwaukee Estuary Area of Concern***

Presented By: Emma Donnelly

Supported By: Dr. Richard Melstrom, School of Environmental Sustainability

This paper presents research on the benefits of removing legacy pollutants in Great AOCs. AOCs are heavily polluted coastal locations identified as priorities for restoration under the Great Lakes Water Quality Agreement between the US and Canada. I estimate the value of cleaning the

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Milwaukee AOC with a sorting model using data on neighborhood populations and moving decisions before and after a series of remediation actions. My results provide evidence that residents value remediation, with an aggregate benefit of \$350 million. Results indicate a large difference in benefits between renters and owners but insignificant differences between race groups.

◆ Poster 60 ◆

***Goal Orientated Occupational Therapy and Independence in Patients with Traumatic Brain Injury***

Presented By: Madilyn McLain

Supported By: Dr. Kiley Tyler, Parkinson School of Public Health

The purpose of the research is to implement goal orientated occupational therapy into traumatic brain injury rehabilitation with regards to deficit in independence. Independence is measured through the Functional Independence Measurement Scale (FIM scale). It is the goal for the therapists to progress patients at a rate that comfortability reduces their length of stay in inpatient facilities and increase the return to work rate by using the FIM scale in goal oriented therapy.

◆ Poster 61 ◆

***GirlForward Social Justice Internship***

Presented By: Jillian Green; Social Justice Internship

Supported By: Jorion Tucker, Center for Engaged Learning, Teaching, and Scholarship

I will be discussing what the Social Justice Internship Program is, what GirlForward is: mission, objectives, programs, what I've learned from this experience, and the projects I've worked on.

◆ Poster 62 ◆

***Misericordia Developmental Training Internship***

Presented By: Kishan Patel; Social Justice Internship

Supported By: Jorion Tucker, Center for Engaged Learning, Teaching, and Scholarship; Danny Wallace, Misericordia

The Developmental Training Programs at Misericordia support participants through the development of life skills, core learning objectives, vocational skills, and employment. This is achieved in an environment that promotes person centered planning and an individualized approach. Participants also enjoy a variety of services and experiences, such as wellness, community, art, cultural events, horticultural programs, therapeutic and sensory activities. The DT Programs are committed to enable all participants to attain a maximum level of social recreational activities, community-based experiences, and personal skill development.

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◆ Poster 63 ◆

***Helping Through the Value of Service***

Presented By: Marcela Garza; Social Justice Internship

Supported By: Jorion Tucker, Center for Engaged Learning, Teaching, and Scholarship

Description of Catholic Charities as an organization and how I've grown during my time there as an intern in the communications department.

◆ Poster 64 ◆

***ONE Northside: Internship Presentation***

Presented By: Anna Alexander, Social Justice Internship

Supported By: Jorion Tucker, Center for Engaged Learning, Teaching, and Scholarship

Over the course of the 2022-2023 school year, I interned with ONE Northside through Loyola's Social Justice Internship program. My presentation details the work that I participated in, and the lessons that I learned from working with a non-profit in Chicago.

◆ Poster 65 ◆

***In the Works of Forging Opportunities for Refugees in America***

Presented By: Mashwa Nadeem; Social Justice Internship

Supported By: Jorion Tucker, Center for Engaged Learning, Teaching, and Scholarship

My presentation will be a culmination of my learning outcomes interning at FORA, the various topics about leadership from class and identifying what my overall role in social justice and community leadership is moving forward.

◆ Poster 66 ◆

***Fungal Species Cross Reactivity in Semen Testing (P30 and Semenogelin)***

Presented By: Gina Della Santina; Mulcahy Scholars Program

Supported By: Wendy Gruhl, Department of Forensic Science

In Forensic case work immunochromatographic assays are used to indicate the presence of semen. The most common test types are P30 and Semenogelin. These antibody based tests are highly specific with little to no cross reactivity with other compounds. In contrast, other semen test like acid phosphatase (AP), another compound in semen, are more likely to cross react with other compounds. Fungal samples were specifically tested due to the cross reactivity in AP. This work evaluates the presence or absence of P30 in fungal samples using ABACard p30 test for the forensic identification of Semen, RSID-Semen, and Seratec PSA Semiquant.

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◆ Poster 67 ◆

***Fungal Species Cross-Reactivity in Semen Testing (Acid Phosphatase)***

Presented By: Katie Pletcher; Mulcahy Scholars Program

Supported By: Wendy Gruhl, Department of Forensic Science

Acid phosphatase (AP), a test used in forensic cases, indicates the presence of semen. AP is also present in fungi. The aim of this project was to further evaluate the level of enzymatic activity in fungi. In this work, a spectrophotometric quantitative method was developed to test for enzymatic activity. Samples were evaluated in the wavelength range 350-600 using the Genesys 10UV spectrophotometer. The highest absorbance wavelength, 368, was used to evaluate enzymatic activity.

◆ Poster 68 ◆

***Analysis of Cannabinoids in Cannabis Products and Analysis by GC-MS***

Presented By: Alexandra Kurm; Mulcahy Scholars Program

Supported By: Dr. James DeFrancesco, Department of Forensic Science Forensic Science

The cannabis plant (*Cannabis Sativa* L., aka hemp) produces a variety of neutral and acidic cannabinoids that have psychoactive and other pharmacological properties. We developed a targeted methodology to analyze various cannabinoids found in edible consumer products via Gas Chromatography-Electron Impact-Mass Spectrometry (GC-EI-MS). Since cannabinoid acids are prone to decarboxylate at elevated temperatures and revert to their neutral counterparts (ex. CBDA to CBD, THCA to THC), they are formulated mainly into non-smokable consumer products. The elevated temperatures used in GC-EI-MS analysis necessitated the addition of a protective group to active -OH groups via derivatization in our method.

◆ Poster 69 ◆

***Mental Health Coping Mechanisms: Study on Mental Health Stigmas, Awareness and How Societies Cope in Italy and Vietnam***

Presented By: Sofia Suarez; Ricci Scholarship

Supported By: Dr. Mine E. Cinar, Director, Center for International Business;

Dr. Molly Melin, Department of Political Science

The research explored how wellness centers are promoted and used by students in Italian Universities and how this is related to stigmas and mental health awareness in Italy and Vietnam. In Vietnam, the focus was on different coping mechanisms for mental illness used in Vietnam that differ from Western traditional methods, such as meditation.

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◆ Poster 70 ◆

***Chinese Segregation and Exclusion in California Schools (1850-1900)***

Presented By: Mia Johnson

Supported By: Dr. Leslie Dossey, Department of History

During the mid-nineteenth century, the state of California implemented racial segregation into its public school system. However, unlike other racial minorities during this time period, Chinese students were legally excluded from public education in California, until 1885. This research will analyze the reasons for the segregation and exclusion of Chinese children through analysis of primary and secondary sources. Nativism fueled by racism, xenophobia, and the perception of the Chinese as an economic threat led to Chinese students being excluded and segregated in California public schools. Analysis of Chinese segregation can create a greater understanding of the breakdown of segregation in schools.

◆ Poster 71 ◆

***Violent Crime in Chicago Compared To Neighborhoods***

Presented By: Alyssa Bronge, Joey Herz, Daniel Campuzano

Supported By: Dr. Frederick Kaefer, Department of Information Systems

This project analyzes violent crime in Chicago and compares the occurrence of crime to neighborhoods in Chicago. Our data comprises two sets from the City of Chicago's database. These data sets give the types of crime and the location of the crime. Using Python to manipulate data this project will display which neighborhoods have the highest rate of recurring crime.

◆ Poster 72 ◆

***Identifying and Preventing School Violence***

Presented By: Karl Atallah, Ann Marie Krusiewicz, Michael Ohliger, Tommy Melidones

Supported By: Dr. Frederick Kaefer, Department of Information Systems

The research aims to investigate the causes of school violence in public and private schools in Chicago and develop strategies to reduce violence. Using data manipulation and analysis with Python and R, the research will identify contributing factors to school violence, such as the presence of school resources, mental health resources, poverty levels, and school climate. The outcome of this research will be the identification of sources of school violence and the development of a strategy for reducing school violence in both private and public schools in Chicago.



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◆ Poster 73 ◆

***Mental Health in College Communities During COVID-19***

Presented By: Rebekah Couturier, Parker Jaeger, Kishan Patel, Jack Poole

Supported By: Dr. Fredrick Kaefer, Department of Information Systems

Our group's selected topic is the rising issue of mental health of college students, particularly those who enrolled in the year 2020 and 2021 (when COVID-19 was most active), in the greater Chicago area. Some highlighting components that contribute to poor mental health in college students include Seasonal Affective Disorder (SAD), heavy course loads, and adjusting to campus life. The mental health of college students has also plummeted due to factors from the COVID-19 pandemic, such as economic strain, job losses, social injustice, mass violence, and various forms of loss related to COVID-19. We also plan on researching how the pandemic impacted faculty and staff's mental health as we suspect the move to online learning impacted them just as much as the student community.

◆ Poster 74 ◆

***Poverty in Chicago***

Presented By: Gabriel Dominguez, Jack McDonell, Brett Johnson

Supported By: Dr. Frederick Kaefer, Department of Information Systems

My group and I selected Chicago poverty as our topic to conduct research and do our project on. We are using data provided by the City of Chicago with different metrics on unemployment and poverty rates by community.

◆ Poster 75 ◆

***Chicago Food Deserts Related to Income and Race***

Presented By: Lauren Gursky William Suwalski, Grace Nagy, Ella Joaquin

Supported By: Dr. Frederick Kaefer, Department of Information Systems

We used Python to develop statistical models to determine the relationship between food deserts in Chicago with income and race.

◆ Poster 76 ◆

***Chicago Homelessness and Shelter Space***

Presented By: Andrea Jovanovic, Harrison Evers, Ethan Moreau

Supported By: Dr. Frederick Kaefer, Department of Information Systems

We will look at the correlation between homeless counts in Chicago by community area and the number of shelter beds available.

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◆ Poster 77 ◆

***Racial Disparities in Chicago Healthcare***

Presented By: Cecilia Miskowski, Ryan Love, Joseph Johnston, Shane Riley

Supported By: Dr. Frederick Kaefer, Department of Information Systems

Our project will focus on examining racial disparities in Chicago health. We will examine the relationship between quality of care in hospitals and the demographic composition of the counties that they are located in. Linear regression is a great technique for doing this research, although classification or clustering could also be used to categorize hospitals or counties based on various characteristics.

◆ Poster 78 ◆

***Accessibility to Busses in Relation to Poverty Levels***

Presented By: Madison Ogrey, Chandler Stegen, Manny Febres

Supported By: Dr. Frederick Kaefer, Department of Information Systems

In our presentation, we will discuss the extent to which Bus Routes are accessible in all community areas of Chicago. Through this data, we aim to establish the correlation between bus route accessibility and poverty levels in these communities.

◆ Poster 79 ◆

***The Correlation between Poverty and Crime in Chicago***

Presented By: Julia Paterek, Amy Vo, Tyler Conner, Anthony Hauser

Supported By: Dr. Frederick Kaefer, Department of Information Systems

We have decided to select the topics of poverty and imprisonment rates to explore for our project. Specifically, we want to look at how different levels of poverty correspond to the likelihood of being arrested and charged with a crime. Some of the variables that will be taken into consideration are income levels, zip codes, severity of crime committed, and length of sentence. With these factors, and a few others, in mind, we will conclude our project by determining whether there is a direct link between poverty/near-poverty communities and crimes committed that lead to sentencing.

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◆ Poster 80 ◆

***Gun Violence Trends Since 2000 in Chicago***

Presented By: Lauren Pflueger, Bilal Khurshid, William Baranda

Supported By: Dr. Frederick Kaefer, Department of Information Systems

Our project is analyzing multiple datasets from the Chicago Data Portal regarding crimes using firearms, victims of crimes using firearms, and homicides specifically using firearms. This project aims to discover patterns in gun violence, and see if there is any correlation between location, date and time, or other externalities and increased gun violence in Chicago. We hope that our findings will allow us to better understand what preventative measures already work well to prevent gun violence, as well as give insights as to what other solutions could be explored in order to decrease the amount of gun violence in Chicago.

◆ Poster 81 ◆

***Racism and Discrimination in Local Resources in Chicago***

Presented By: Natasha Williams, Jenny Doan, Damali Nazario, Belen Salas

Supported By: Dr. Frederick Kaefer, Department of Information Systems

Many social problems in data including racism encoded in datasets in regard to race promoted by segregation in Chicago. Some of the resources differ from neighborhoods are schools, economic disparity, etc. However, data can be used for good by working to address this problem and identifying where the issue lies by helping mitigate future disparities.

◆ Poster 82 ◆

***LOOP Marketing Research Project***

Presented By: Riley Hall, Natasha Schuckman, Julia Camnetar, Ella Ivory, Cassidy Jenkins, Caili Murphy

Supported By: Dr. Stacy Neier Beran, Department of Marketing; Caro Bush and Elise Giles, Co-Founders of LOOP

We will consult LOOP on increasing current user engagement, with a decreased emphasis on increasing user base. Research will also be done on what areas of the business currently cause customer dissatisfaction. Our research will focus on sustainable fashion, e-commerce, and new industry emergence possibilities in the context of current customer engagement.

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◆ Poster 83 ◆

***Loop Consumer Research***

Presented By: Grace LaLonde, Alesandria Noble, Ian Rath, Nurain Charania, Ashton McKinney, Johanna Graf, Alena Bardic, Evan Harrold

Supported By: Dr. Stacy Neier Beran, Department of Marketing

For our research proposal, we are helping LOOP, which is an online resale company focused on transactions of clothing being conducted on a college campus, to define the values and perceptions of their target consumers. Understanding the values of LOOP customers will help LOOP further understand the decision making progress that a consumer goes through when deciding to use LOOP. Through eight research objectives, we are exploring how consumer behaviors and market trends have impacted LOOP directly as well as the second-hand clothing industry in general. As a squad we strive to create a collaborative research environment where we conduct our research objectives with the overall focus on LOOP's integration into the second-hand clothing industry currently and in the long-term.

◆ Poster 84 ◆

***Community and Sustainability within LOOP***

Presented By: Emma Polley, Mia Mc Dermid, Taylor Venuto, Liza Schaefer, Emma Nolan, Audrey Tremaine, Megan Nemec, Emma Polley

Supported By: Dr. Stacy Neier Beran, Department of Marketing; Caro Bush, LOOP co-founder; Elise Giles, LOOP co-founder

Loop, an online resale website, has a lot of users but only a small percent is active. Loop needs to know how to gain more engagement, and research is needed to see what works and what doesn't. Research also needs to be conducted to see what Loyola students like to connect with them more to make loop a more preferable way of shopping, as this will also help form more of a community. Our group decided to explore the question "How does LOOP instill community and sustainability when influencing consumers?"

◆ Poster 85 ◆

***User Interaction within LOOP's Sustainability Community***

Presented By: Justine Rehak, Anthony Elkareh, Steph Chiganos, Maddie Ganoe, Joe Baratti, Steven Sloop, Zachary Scott

Supported By: Dr. Stacy Neier-Beran, Department of Marketing

We are addressing the business issue of how LOOP can increase its current website to increase user interaction. Research objectives include exploring the driving forces of community engagement on e-commerce platforms, investigating how different marketing activations can increase user interaction, identifying what college students value in quality customer service, evaluating how to better emphasize the values shared between LOOP and their customers, and

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assessing what organizations within the Loyola community would best assist LOOP in advertising.

◆ **Poster 86** ◆

***Engagement with Online Experience***

Presented By: Mireille Saeed, Andrew Bryan, Nany Herrejon, William baranda, Sowmya Monroe, Maggie Vallillo, and Morgan Pechenik

Supported By: Dr. Stacy Neier Beran, Department of Marketing; LOOP

With the increasing importance of ecommerce, how consumers engage with the brand has become a top priority. We want to explore how LOOP's online experience influences the level of engagement with the brand. Through the use of surveys and research, we will be exploring the relationship between user and brand. At the moment, we have found that engagement is an integral part of the consumer shopping experience.

◆ **Poster 87** ◆

***Technology and Consumer Engagement for LOOP***

Presented By: Alaina Runkel, Sicilia Mirante, Taylor Nguyen, Brigitte Cueter, Katie Gardner, Anna Shea, Maddie Thompson

Supported By: Dr. Stacy Neier Beran, Department of Marketing; LOOP

We are exploring how LOOP can develop their technology to increase consumer engagement. Our group will achieve this by exploring the following objectives: To investigate consumer comfort levels on privacy sharing, to assess how sellers find value in an online consignment store, to explore how the user experience on a company's website affects consumer loyalty, to evaluate how brands interact with consumers through technology, to explore how consumers can engage with online small-businesses, to explore buyer-seller communication in e-commerce, and to evaluate consumer engagement in online sustainable shopping.

◆ **Poster 88** ◆

***Marketing Research the LOOP LUC***

Presented By: Daniella Paba

Supported By: Dr. Stacy Neier Beran, Department of Marketing

Marketing Research on the LOOP LUC.

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◆ Poster 89 ◆

***LOOP Marketing Research***

Presented By: Elizabeth Gibson, Kasey Bell, Arturo Capetillo, Philip Dai, Abigail Wilm, Camila Gadea, Kayla Kalua

Supported By: Dr. Stacy Neier Beran, Department of Marketing

We will be eager to learn, open to new ideas, and ready to challenge assumptions. How can LOOP engage potential sellers and buyers to be active participants? To explore how to convert consumers to buy secondhand clothes when trend cycles move so quickly.

◆ Poster 90 ◆

***Project Cannonball: Funfillment***

Presented By: Ryley Bryzeal, Stephanie Arcos, Ryley Bryzeal, Cadie Devous, Megan Nemec, Raffaella Olshansky, Tusli Patel

Supported By: Dr. Stacy Neier Beran, Department of Marketing; Zev Salomon

Project Cannonball seeks to effectively combine entertainment and learning for students and consumers in order to create a "fun" interactive experience that is "fulfilling" and appeals to people of all ages. In building this entertainment experience, we collaborated with a Chicago-based design firm intending to design the country's first STEAM-themed urban waterpark.

◆ Poster 91 ◆

***Fision Design***

Presented By: Eugenia Carvajal, Emilia Moliva, Christian Portone, Mateo Salvidea, Riz Zaheer, Anthony Zanin, Olivia Zolper

Supported By: Dr. Stacy Neier, Department of Marketing, Zev Salomon

For our design thinking course, our "VISION" is to incorporate a STEAM based curriculum into a waterpark on behalf of a Chicago based Architecture firm. Our motivation behind our deliverables is to create a "FUTURE" where students can be simultaneously entertained and engaged in their education.

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◆ Poster 92 ◆

***Simulation of Habitat Degradation on Marine Ecosystems***

Presented By: Kate Bove; Provost Fellowship

Supported By: Dr. Peter Tingley, Department of Mathematics and Statistics, Dan Zimmerman, Department of Mathematics and Statistics

This project aims to analyze the effect of habitat degradation on species interactions by utilizing evolutionary game theory to create a Python simulation of this process. We focused on two species interaction such as fish and sharks. Interactions take place in each square of a (n x n) grid. With some probability dependent on node population, random interacting players play a game using a matrix modeled by the game Prisoner's Dilemma. To simulate habitat loss, random nodes are selected and set to capacity 0, no longer maintaining population. This simulation is run for thousands of iterations and graphed over time.

◆ Poster 93 ◆

***Characterizing Lewis Acid-Carbonyl Interactions in the Presence of TMSCl Via In-Situ IR Titration***

Presented By: Konrad Kutrzuba; Mulcahy Scholars Program; Provost Fellowship

Supported By: Dr. James Devery, Department of Chemistry; Sophi Todtz, Department of Chemistry

Carbonyl-olefin metathesis (COM) is an important C-C bond forming reaction that utilizes FeCl<sub>3</sub> as a Lewis acid catalyst. The COM reaction creates an alkene and carbonyl byproduct from a ketone-olefin pair. We previously determined that carbonyl byproducts interact with the FeCl<sub>3</sub> catalyst to form 4:1 carbonyl:FeCl<sub>3</sub> complexes which inhibits the reactivity of COM. Recent results suggest that the additive TMSCl forms a new species with FeCl<sub>3</sub>, preventing the termination of COM from byproduct carbonyls. Employing in-situ IR titration alongside conductivity measurements, we investigate whether other Lewis acids may participate in similar interactions with TMSCl.

◆ Poster 94 ◆

***Providing a User-Friendly Environment for the Physically Challenged - From an Engineer's Perspective (Part I)***

Presented By: Deja Scott; Mulcahy Scholars Program

Supported By: Dr. Vincent Chen, Department of Engineering

This is Part I of the project aiming to provide a user-friendly environment for the physically challenged. In this project, we would like to investigate the feasibility of upgrading affordable and commercialized products that were developed for the convenience of able-bodied individuals while incorporating safety protocols designed to prevent hazardous conditions that may occur to

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individuals who are physically challenged. We plan to develop an open-source hardware interface by integrating the controller area network (CAN) and safety monitoring/responding circuitries to upgrade the safety of devices designed for use by the physically challenged.

◆ **Poster 95** ◆

***Geospatial Analysis of Crime in Chicago***

Presented By: Isabella Vitacco, Kassidy Ivers, Alex Mueller, Milan Korsos

Supported By: Dr. Frederick Kaefer, Department of Information Systems

We are utilizing reputable Chicago records and databases to show the relationship between zip code and crime rates throughout the city.

◆ **Poster 96** ◆

***10-Year Update on Energy Dependence of Cosmic Ray Anisotropy with IceTop***

Presented By: Gunwati Agrawal, Savannah Lehrman

Supported By: Dr. Rasha Abbasi, Department of Physics

In this work we aim to study the change in cosmic ray anisotropy as detected by IceTop over a ten-year period between energy bands centered at 410 TeV and 1.8 PeV. IceTop is a cosmic ray detector located at the South Pole. Previous work conducted during the construction of IceTop analyzed the energy-dependence of cosmic ray anisotropy. A large-scale deficit in cosmic rays was found in the lower-energy band, which persisted and increased in amplitude in the higher-energy band. Our research is an update that utilizes a stable detector configuration, larger data set and updated data processing methods.

◆ **Poster 97** ◆

***How Musicians Can Utilize the Guitar's Acoustic Properties***

Presented By: Jessica Moore

Supported By: Dr. Gordon Ramsey, Department of Physics

Guitars are extremely versatile instruments due to the myriad of ways in which the player can alter the timbre. This study explores how the timbre of the acoustic guitar is affected by alterations in the string type and gauge, the excitement location, pick versus pluck excitements, and the placement of the capo. A theoretical understanding of the previously mentioned changes can justify and direct a guitarista's artistic decisions in Flamenco, Irish Traditional, and Country/Folk music. Understanding the connection between the technical and artistic aspects of the guitar can guide a musician in creating the effects appropriate for each genre.



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◆ Poster 98 ◆

***The Mechanism Of Strongly Interacting Massive Particles And Their Application As A Model For Thermal Relic Dark Matter***

Presented By: Andrew Rogers

Supported By: Dr. Walter Tangarife, Department of Physics

One possibility for dark matter's identity is that it is a cold thermal relic from the early universe. Strongly Interacting Massive Particles (SIMPs) are a type of hypothetical particles that fit this description. SIMPs are predicted to interact more strongly with each other than ordinary matter and would be more difficult to detect. This project aims to study the properties and behavior of SIMPs. The SIMP paradigm is based on a 3-to-2 self annihilation process which also predicts a sizable number of 2-to-2 self interactions which offer solutions to the cuspy halo and to-big-to-fail small structure problems.

◆ Poster 99 ◆

***Effects of DNA Sequences on DNA Supercoiling***

Presented By: Nicole Todd; Mulcahy Scholars Program

Supported By: Dr. Brian Cannon, Department of Physics; Gilberto Garcia, Lab Assistant, Physics Department; Cole Geinosky, Lab Assistant, Physics Department

This project examined how short tandem repeat defects in DNA structure alter the mechanical properties of dsDNA and influence its folding into supercoils. My project developed the DNA synthesis procedures and built DNA constructs for studying supercoiling using Intercalation-induced Supercoiling of DNA, allowing us to observe the supercoiling processes in real-time. After creating the DNA, Sytox Orange was intercalated in it to induce supercoiling. The DNA was imaged with a 532-nm laser, and plectoneme density maps were created to interpret our results. This model system can be used to explore how CAG hairpins and temperature affect the formation of supercoils.

◆ Poster 100 ◆

***Phenomenology of Feebly Interacting Massive Particles***

Presented By: Themistoklis Tzellos

Supported By: Dr. Walter Tangarife, Department of Physics

Dark matter makes up 27% of the universe but, because it doesn't interact with light, we haven't detected it (yet). In this work, I study the phenomenology of a particle that is a candidate for dark matter, the Feebly Interacting Massive Particle (FIMP). I examine the mechanism by which this particle is created as well as the evolution of the particle in an expanding universe.

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◆ Poster 101 ◆

***A Meeting of Two Worlds: How Islam Affected the US Constitution***

Presented By: Christian Voelker; Rudis Fellowship

Supported By: Dr. Sarah Maxey, Department of Political Science

We will analyze the two documents separately to extract their similarities, linkages between the Founding Fathers and Islam, as well as the transmission of ideas out of the Middle East into Europe. We find that the two documents share a variety of similar conceptual ideas, such as religious freedom, and a similar beginning. Additionally, we find that the Founding Fathers were aware of Islam, possessed religious texts from the faith, and had a mix of positive and negative views towards Islam. We also find that the ideas from the Constitution of Medina can be transmitted out of the Middle East to Europe, affecting European philosophies and later the Founding Fathers.

◆ Poster 102 ◆

***The Consequences of Descriptive Representation at the Local Level***

Presented By: Maddie Schade

Supported By: Dr. David Doherty, Department of Political Science; Dr. Dana Garbarski, Department of Sociology

Does descriptive representation in low salience, local political institutions affect residents' views about the board, feelings of efficacy, and inclination to learn more about these bodies? We leverage the size of Cook County and the size and diversity of the Cook County Board of Commissioners to execute a deception-free survey experiment that uses photos and names of actual board members to cue ethnoracial and gender identities. We assess how these descriptive representation cues affect attitudes about the board and intentions to engage in participatory acts related to the board among the Cook County residents we survey.

◆ Poster 103 ◆

***Are Glutamatergic Projections from the Laterodorsal Tegmental Nucleus to the Ventral Tegmental Area Sufficient for the Induction of Cocaine Sensitization?***

Presented By: Emily Burda

Supported By: Dr. Stephan Steidl, Department of Psychology

Laterodorsal tegmental nucleus (LDTg) glutamate inputs to the ventral tegmental area (VTA) are crucial for the development of cocaine sensitization. This study uses optogenetics to test the sufficiency of exciting LDTg-VTA glutamatergic projections for the induction of a sensitized state following transfection with blue light-activated channelrhodopsin-2 (ChR-2) into the LDTg. Inputs to the VTA are then repeatedly excited across days. Mice are subsequently tested for their locomotor response to cocaine. We expect that excitation of the LDTg-VTA pathway during

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pretreatment is sufficient to induce enhanced locomotor counts during subsequent cocaine exposures.

◆ **Poster 104** ◆

***The Clinical Profile of Psychopathy***

Presented By: Patrick Carabell

Supported By: Dr. Jeffrey Huntsinger, Department of Psychology; Dr. Art Lurigio, Department of Criminal Justice

People with psychopathy are characterized as callous, non-empathic, manipulative, impulsive, and crime prone. The definition of psychopathy is imprecise, and the condition is not recognized as a mental disorder in the Diagnostic and Statistical Manual (DSM-5-TR). This project examines research on the spectrum of traits and behaviors that constitute psychopathy. We compare psychopathy with Antisocial Personality Disorder and other similar clinical profiles in terms of how such anomalies are assessed, managed, and treated in different settings. We posit that the further codification of psychopathy as a diagnosable disorder could help in identifying interventions and treatments for this condition.

◆ **Poster 105** ◆

***A Day in the Life of a Cook County Juvenile Probation Intern!***

Presented By: Heaven Cunningham

This poster/presentation will illustrate what a typical day as an intern consisted of. It will include background on the role of the unit I was assigned and will further outline any duties and obligations held as an intern. Daily responsibilities will be detailed, and the presentation will conclude with takeaways and how this experience is important to my career path.

◆ **Poster 106** ◆

***The Emergence of Crisis Services Within Police Departments***

Presented By: Daria Komeza

I am completing my internship at Arlington Heights Police Department with their Police Crisis Worker. Crisis Services are in higher demand and being implemented in more police departments and federal agencies than ever before. This program holds many roles, but one of the most crucial is having direct interactions with those facing obstacles due to mental health illnesses. I hope this presentation helps to spread awareness about the rise of mental health calls, as well as what this rapidly growing field of Crisis Services provides to the communities and why it should be implemented in all departments.

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◆ Poster 107 ◆

***The Association Between Cognitive Disengagement Syndrome, Disassociation and Self-Awareness***

Presented By: Essie (Catherine) Humberston, Laurel Miskovic, Logan Phengsomphone

Supported By: Dr. Zoe Smith

The present study examines the relationship between cognitive disengagement syndrome and symptoms of disassociation and self-awareness in college students. Using a hierarchical linear regression, we expect to find a moderate positive correlation between CDS and dissociation and a weak negative correlation between CDS and self-awareness while accounting for associated disorders.

◆ Poster 108 ◆

***Examining the Impact of Gender Differences in Domains of Psychopathology***

Presented By: Elizabeth Marquez

Supported By: Dr. Cate DeCarlo Santiago, Roxanna Flores M.A, Sarah Jolie M.A.; Department of Psychology

Research highlights the importance of stress on the development of psychopathology (Gryzywacz et al., 2006). This study examines gender differences regarding the impact of parenting stress on psychopathology in a sample of 174 Latinx caregivers, with a child between ages 6-10. Using data from baseline measures, T-tests demonstrated that females reported higher somatization, depression, and phobia than males. Correlations revealed positive associations between parenting stress and report of psychopathology symptoms in caregivers, with females reporting more symptoms than males. Research should continue to examine how gender moderates pathways to psychopathology and develop tailored interventions to support female caregiver mental health.

◆ Poster 109 ◆

***Effective Implementation of the Socio-Ecological Model to Decrease CVD Mortality through Promotion of Fruit and Vegetable Consumption in African American Women***

Presented By: Ainsley Pew, Tijana Nikolic, Georgia Baker, Idiake Irumundomon, Ruslan Malovanyy

Supported By: Dr. Justin Harbison, Department of Public Health Sciences; Dr. Sparkle Springfield, Department of Public Health Sciences

This literature review aims to investigate and analyze existing research about fruit and vegetable intake interventions for African American women through the social-ecological model. By increasing fruit and vegetable consumption, we hope to see a significant inverse relationship, with a decrease in mortality of African American women due to diet-related diseases. We will explore interventions at the cultural, community, individual, and interpersonal levels of the

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social-ecological model to review their effectiveness in increasing fruit and vegetables within the diet.

◆ **Poster 110** ◆

***Religions in Asia - Exploring Hinduism***

Presented By: Lydia Hamilton, Katherine Fangman

Supported By: Dr. Yarina Liston, Department of Theology

This presentation educates on the religion of Hinduism with an emphasis on Traditions, Rituals, and Modern expressions. All of the information provided is from conversations with members of the Shree Ganesh Temple of Chicago.

◆ **Poster 111** ◆

***Exploring a Buddhist Temple***

Presented By: Sydney Judnich, Audrey Nolen

Supported By: Dr. Yarina Liston, Department of Theology

I will be visiting a Buddhist temple and describing that experience. I will be presenting what I learned from interviewing people who practice the Buddhist faith and what it was like sitting in on a service. I will be sharing my perspective as a person of Christian faith learning and respectfully exploring a different faith.

◆ **Poster 112** ◆

***Exploring the Chicago Zen Buddhist Temple***

Presented By: Nicole Kozuch

Supported By: Dr. Yarina Liston, Department of Theology

As a student enrolled in Loyola's Religions of Asia course, I chose to focus on Buddhism for my Engaged Learning project due to its welcoming nature and core beliefs. This project concentrates on one of the several Buddhist temples located in the city of Chicago - the Zen Buddhist Temple. Located in Lake View in what was once a Pentecostal Church, this temple provides services such as meditation and public services to its community. I will discuss my experience in visiting the temple, as well as having the privilege of hearing from its community members.

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◆ Poster 113 ◆

***Marissa Mahrenholz's Engaged Learning Project***

Presented By: Marissa Mahrenholz

Supported By: Dr. Yarina Liston, Department of Theology

I'll be presenting about the religion of Sikhism and the interviews I conducted at a Gurdwara.

◆ Poster 114 ◆

***Buddhism in the Local Chicago Area***

Presented By: Cameron Pham

Supported By: Dr. Yarina Liston, Department of Theology

This presentation will discuss practices at a local Buddhist site and will recount new things I've learned and insights I've gained into the religion.

◆ Poster 115 ◆

***Hinduism in Loyola's Community***

Presented By: Alyssa Rickert

Supported By: Dr. Yarina Liston, Department of Theology

Following along with the course content taught in THEO 299, my presentation will share my experience at the Shree Ganesh Temple of Chicago, recounting what I learned and connecting it back to Loyola.

◆ Poster 116 ◆

***How Hinduism is Interpreted and Represented in the 21st Century***

Presented By: Mikaila Flagg

Supported By: Dr. Yarina Liston, Department of Theology, Shree Ganesh Temple of Chicago

This research paper will be centered on understanding the Hindu faith from new and old followers. This paper will examine how followers became first connected to the religion and what practices and traditions hold the most significance in their lives. Additionally, this paper will describe a first-hand experience of the meditation practices completed through the help of the Shree Ganesh Temple of Chicago. This paper will end with an examination of fellow Loyola students who are of the Hindu faith and what challenges they encounter when connecting to their religion while actively attending a Catholic University.

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◆ Poster 117 ◆

***Religions of Asia - Visiting the ISKCON Chicago Temple***

Presented By: Richa Patel

Supported By: Dr. Yarina Liston, Department of Theology

For my engaged learning project, I will be visiting the International Society for Krishna Consciousness (ISKCON) temple. ISKCON is a Vaishnavite Hindu temple that focuses on Lord Krishna. I am excited to explore this community, especially because it is so close to the Loyola Lakeshore Campus. With my visit and project paper, I hope to better understand ISKCON's mission as well as the community that they have built here in Chicago, and how that has modified their practices from our in class learning. I will then take that knowledge and reflect on what this means in terms of Loyola's mission of global awareness, as in exploring other cultures and thought systems, we can be more accepting and conscious of our choices.

◆ Poster 118 ◆

***Impact of NGO Outreach on At-Risk Youth Populations in Italy and Vietnam***

Presented By: Emma Geiser; Ricci Scholarship

Supported By: Dr. Mine Cinar, PhD., Faculty Sponsor, Department of Economics; Dr. Anne Wingenter, PhD., Italy Research Supervisor, John Felice Rome Center; Dr. Ngyuen Luu Bao Doan, PhD., Vietnam Research Supervisor, Vietnam Center

The outreach tactics and target population of non-governmental organizations vary by country and political & cultural climates. This project centers on NGO outreach to different populations of at-risk youth in both the Western and Eastern hemisphere. In Italy, there exists a generation of children of immigrants that are not automatically granted citizenship due to Italy's traditional naturalization laws. In Vietnam, the Khmer ethnic minority makes up 1.38% of the Vietnamese population and is a traditionally agrarian group. Despite the differences in political and cultural climate, the common denominator between these two groups of at-risk youth is the impact of educational opportunities and academic performance.

◆ Poster 119 ◆

***Ricci Scholarship: Comparison of How the Pandemic Affected Micro-Businesses Within the Food and Beverage Industry Sector in the "East" and "West"***

Presented By: Benjamin Mielke; Ricci Scholarship

Supported By: Dr. Cinar, Dr. Wingenter, Dr. Nguyen

The research goal is to understand the fiscal policy precedent set from prior economic downturns in Rome and Ho Chi Minh City. He would like to investigate coping mechanisms utilized by SMEs during the COVID-19 pandemic and how they affected business survival rates.

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◆ Poster 120 ◆

***Matching Accelerometer Data to State of Balance***

Presented By: Sharf Abutaleb; Provost Fellowship

Supported By: Dr. Vincent Chen, Department of Engineering

This research project involved constructing four instrumentation amplifiers to magnify signals from force sensors, with the aim of creating a predictive model for an individual's state of balance. The team employed Simulink and the Data Acquisition Toolbox to interface with a National Instruments DAQ system, collecting and processing the sensor data. The data was then interpreted using MATLAB's Machine Learning and System Identification Toolboxes. Ultimately, the project sought to leverage machine learning algorithms to accurately predict a person's balance state, potentially leading to improved diagnostics, interventions, and support for individuals with balance-related issues.

◆ Poster 121 ◆

***Bias Against Single Mothers During the COVID-19 Pandemic***

Presented By: Marcella Accardi; CAS Summer Research Fellowship

Supported By: Dr. Tracy De Hart, Department of Psychology

Single mothers face discrimination in their everyday lives and the COVID-19 pandemic was no exception. The goal of the current study was to examine some of the effects of discrimination during the COVID-19 pandemic on single mothers. More specifically, the current study examined the role of women's own endorsement of hostile and benevolent sexism in predicting their self-esteem after recalling a time they were discriminated against during the pandemic. The participants were all single mothers averaging 42 years old with the majority employed at the time of the study. Single mothers who did not strongly endorse sexism reported decreased state self-esteem in response to discrimination. In other words, women who strongly (versus weekly) endorsed sexism reported higher self-esteem after recalling discrimination.

◆ Poster 122 ◆

***Design of a Predictive Method for Obstacle Detection and Safe Operation of Autonomous Vehicles***

Presented By: Lila Areephanthu; Provost Fellowship

Supported By: Dr. Brook Abegaz

Although the use of autonomous vehicles to transport people and objects from one location to another is an interesting concept, the operation of autonomous vehicles opens doors to various safety issues and security vulnerabilities. This is especially evident during the presence of traffic and unidentified obstacles on the road. In addition, the cost of the sensors used in autonomous vehicles is high and the sensor hardware itself is prone to malfunction and failure. Accurate



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operation of these sensors is important to the overall safety of the passengers inside the vehicle because they can determine whether an accident will be avoided.

◆ **Poster 123** ◆

***Visit to a Local Gurdwara***

Presented By: Cheka Bauldry

Supported By: Dr. Yarina Liston, Department of Theology

A study of Sikhism from guided academic learning and discussion as well as engagement with local Sikh individuals to gain a perspective on the traditions, beliefs, practices, history, and context within the world, the country, and the region.

◆ **Poster 124** ◆

***How Do We Make Artificial Intelligence More Human-like?: Improving Object-Shape Sensitivity in DCNNs through Training with Non-Diagnostic Texture***

Presented By: Luke Baumel, Mikayla Cutler; Carbon Undergraduate Research Fellowship Program

Supported By: Dr. Nicholas Baker, Assistant Professor, Psychology Department, Neuroscience Program; Dr. George K. Thiruvathukal, Department Chairperson and Professor, Department of Computer Science, Neuroscience Program Dr. Silvio Rizzi, Computer Scientist, Argonne Leadership Computing Facility

Artificial Intelligence is becoming a larger part of daily life and a state-of-the-art method for neuroscientists. As more trust is placed in Artificial Intelligence, it must accurately represent the primate brain. Currently, Deep Convolutional Neural Networks (DCNNs) are the state-of-the-art in image classification but do not accurately represent the way primate brains perceive images. DCNNs take a far less holistic-object-shape-oriented approach, placing a heavier weight on the texture of images than their shape and causing inaccuracy. What remains unknown is whether this absence of shape-sensitivity is inevitable of DCNNs' architecture or whether it depends on the data used during training.

◆ **Poster 125** ◆

***TNF $\alpha$  Reduces the Maximum Respiratory Capacity of Mitochondria in hASM Cells***

Presented By: Claire Creighton

Supported By: Dr. Gary Sieck; Dr. Sanjana Mahadev Bhat

Tumor necrosis factor alpha (TNF $\alpha$ ) is a proinflammatory cytokine that produces inflammation in airway diseases. TNF $\alpha$  increases mitochondrial volume density and O<sub>2</sub> consumption rate (OCR) in human airway smooth muscle (hASM) cells; however, when normalized for mitochondrial volume density, the OCR per mitochondrion decreases. Our quantitative

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histochemical technique measures the maximum velocity of the succinate dehydrogenase reaction (SDHmax) in individual hASM cells. We hypothesized that TNF $\alpha$  decreases SDHmax per mitochondrion in individual hASM cells. Following TNF $\alpha$  treatment, mitochondrial volume density increases, consistent with reduced SDHmax, suggesting increased ATP demand from TNF $\alpha$  is met with increased mitochondrial volume density and SDHmax.

◆ Poster 126 ◆

***Assessing the Impact of Investments in Community-Based Organizations as a Method of Promoting Equitable Economic Recovery from the Covid-19 Pandemic in Chicago's South and West Sides.***

Presented By: Sean Cunnane; Center for Urban Research and Learning (CURL) Fellowship  
Supported By: Dr. Gina Spitz, CURL

The Chicago Community Trust (CCT) has made capital investments in several community-based organizations in Chicago neighborhoods which have been significantly impacted by the Covid-19 pandemic. CURL is assessing the economic impact that these investment sites have had on their local community. We have employed on-the-street surveys, focus groups, MasterCard spending data, and SafeGraph cell phone data to assess this impact. Our goal is to find how future CCT investments can best promote equitable economic recovery, particularly in Black and Latinx communities which have been especially impacted by Covid-19.

◆ Poster 127 ◆

***Effect of Immigration Status on Knowledge, Attitudes, and Beliefs around COVID-19 within the Suburban Cook County Hispanic/Latino Community***

Presented By: Farah Elhoumaidi; Carroll and Adelaide Johnson Scholarship; Social Justice Fellowship

Supported By: Dr. Nallely Mora, Research Assistant Professor, Public Health Sciences, Parkinson School of Health Sciences & Public Health Loyola University Chicago; Dr. Amy Luke, Department Chair and Professor, Public Health Sciences, Parkinson School of Health Science The COVID Equity Response Collaborative: Loyola (CERCL)

After disseminating anonymous surveys, holding focus groups, and conducting interviews intended to examine the effect of immigration status on knowledge, attitudes, and beliefs around COVID-19 within the suburban Cook County Hispanic/Latino community, the collected data reveals the significant hardships experienced in dealing with the COVID-19 pandemic. My research grew even further and focused more specifically on the effect of undocumented status on COVID-19 experiences among the suburban Cook County Hispanic/Latino community. This study aims to transfer the knowledge gained regarding vaccine hesitancy and experiences during the pandemic and link identified existing resources with participants and community stakeholders.

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◆ Poster 128 ◆

***Perceptions of Algorithmic Bias in Video Interviewing Software***

Presented By: Theresa Fister; Carroll and Adelaide Johnson Scholarship; Social Justice Fellowship

Supported By: Dr. George K. Thiruvathukal, Department of Computer Science

According to existing research, artificial intelligence, while sometimes considered neutral by its proponents, can perpetuate the implicit and explicit biases of the engineers and designers responsible through the process of machine learning. Despite the risks, companies and organizations increasingly utilize artificial intelligence in their hiring processes, from recruiting to interviewing. This study focuses on the experiences of individuals with AI video interviewing software. By highlighting the experience of people seeking employment, we hope to gain insight on how the interview process using AI technology compares to their expectations of the interview process as a whole.

◆ Poster 129 ◆

***Exploring the genomic diversity of Staphylococcus Epidermidis from Different Isolation Sources***

Presented By: Sandra Jablonska; Carbon Undergraduate Research Fellowship Program

Supported By: Adriana Ene, MS; Department of Biology/Bioinformatics Program, Dr. Catherine Putonti, PhD; Department of Math and Statistics, Dr. Swarnali Banerjee, PhD, Department of Biology/Bioinformatics Program

*Staphylococcus epidermidis* is a prominent and often benign member of the human skin microbiota. While it predominantly colonizes the skin, it can also be found in areas of the human microbiota, such as the urinary or gastrointestinal tract. *S. epidermidis* is an opportunistic pathogen and is one of the most common sources of infections from medical devices, particularly in immunocompromised patients. *S. epidermidis* infections can result in boils, endocarditis, wound infections, and other types of inflammation, with progression, assisted through the production of biofilms. These biofilms often confer antibiotic resistance, leading to chronic and persistent infections. Despite the importance of this bacterial member in human health, the epidemiology and transmission of *S. epidermidis* are overlooked in healthcare settings. As the medical community continues expanding their knowledge of human microbiomes, understanding the critical role of *S. epidermidis* is needed.

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◆ Poster 130 ◆

***Exploring the Effect of Artificial Sweeteners on Streptococcus Mutans Growth and Biofilm Formation***

Presented By: Hannah Jaghab, Thomas Osika

Supported By: Dr. Jeremy Ritzert, Department of Biology, Dr. Kristen Krueger, Department of Anthropology

Having used optical density and pH measurements, this study examined Streptococcus mutans growth and biofilm formation in broths containing either sucrose, saccharin, xylitol, sorbitol, or sucralose which were compared to sucrose and glucose controls. Initial results imply that sucrose leads to the highest development of biofilms, whereas xylitol inhibits their formation best. These findings contribute to the understanding of the oral microbiome and its response to various stimuli. The data suggests a potential correlation between high sucrose consumption and increased dental hygiene risk. Further studies may investigate the viability of consistent use of the artificial sweeteners with minimal oral detriments.

◆ Poster 131 ◆

***ActionPoint App: An App to Detect and Combat Cyberbullying Through the Strengthening of Parent-Teen Relationships***

Presented By: Maddie Juarez

Supported By: Dr. Yasin Silva, Department of Computer Science Dr. Deborah Hall, Department of Psychology Arizona State University; Seong Jung, Arizona State University; Dainel Fogglesong, Arizona State University

Cyberbullying is the use of online communication to threaten, intimidate, or send hurtful messages to someone. The ActionPoint app is designed to assess the risk of cyberbullying and set healthy boundaries for social media use. Parents and teens complete ActionPoints, a series of interaction-based app modules where they engage in evidence-based activities that help them get a better understanding of cyberbullying risks and healthy online behaviors. For instance, a module in the app assesses the parent and child's knowledge of cyberbullying independently, then it compares the two to highlight differences and spark discussion with the aim of reducing cyberbullying.

◆ Poster 132 ◆

***Ultrasonic Brain Drug Delivery for Neurological Diseases and Disorders***

Presented By: Nuala Kalensky; Provost Fellowship

Supported By: Dr. Muna Aryal, Dr. Haijun Xiao, Engineering

Our lab is equipped with noninvasive and targeted drug delivery tools. Particularly, we are tailoring the use of the acoustic energy either alone or combining it with

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microbubbles/nanoparticles to achieve noninvasive and targeted brain treatment which can't be done by any of the existing neuro-technologies such as stereotactic surgeries or new pharmaceuticals. Our effort is to understand how ultrasound affects drug distribution, retention, its clearance, and its consequences on the neuroimmune system. We are using ultrasound as a drug delivery tool and developing new imaging and therapeutic techniques for basic, applied, and translational research.

◆ Poster 133 ◆

***Increase of Hypertension in Middle Age African-Origin Adults***

Presented By: Mikaela Lies; Provost Fellowship

Supported By: Dr. Lara Dugas, Parkinsons School of Health Science and Public Health, Candice Choo-Kang, Parkinsons School of Health Science and Public Health, Dr. Amy Luke, Parkinsons School of Health Science and Public Health

As populations continue to age, we have seen a significant increase in the prevalence of hypertension. However, it is not understood if this rise of hypertension is expected or circumstantial. This longitudinal cohort study investigates the increased prevalence with age in middle-aged African-origin adults within 5 countries of varying economic transition. Nearly 2,500 participants of African descent from 5 different countries of varying development have taken part in The Modeling the Epidemiological Transition Study. This cohort study demonstrates the relationship between participant's yearly weight gain and increased prevalence of hypertension.

◆ Poster 134 ◆

***Camouflaging and Adjusting to College in Females with and without Autism Symptomatology***

Presented By: Aisha Mounir, Emily Cauley, Ellie Forster, Elizabeth Stotz

Supported By: Dr. Denise Davidson, PhD, Department of Psychology, Dakota Morales, MS Department of Psychology

Females with autism symptomatology may engage in more camouflaging behaviors during social situations than males. We examined how camouflaging behaviors are associated with college adjustment in females with and without autism symptomatology. 102 female college students attending a university in the U.S. completed online measures assessing autism symptomatology, camouflaging, and college adjustment. Independent samples t-tests showed that females with autism symptomatology reported significantly higher camouflaging behaviors, and lower academic and socio-emotional adjustment to college. Analyses revealed that camouflaging significantly predicted lower college adjustment. Findings suggest that college support programs targeting camouflaging in females with autism symptomatology may be beneficial.

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◆ Poster 135 ◆

***Design of a State-Predictive and Robust Control of Energy Storage Units for Smart Power Grids by Minh Nhu and Dr. Brook W. Abegaz - Engineering Department, Loyola University Chicago***

Presented By: Minh Nhu

Supported By: Brook Abegaz, Department of Engineering

The United States electric power grid is going through a lot of transformations in recent years using smart grid technology. The research problem addressed in this project is related to the unreliability of unpredictable sources and storage units in smart power grids. In the currently proposed work, the design and implementation of a state-prediction of multiple storage states would be identified. Also, an application would also be developed that shows the status of each unit and implements a robust controller.

◆ Poster 136 ◆

***A Literature Review on American Trypanosomiasis (Chagas Disease): The Kiss of Death***

Presented By: Sofia Ponce

Supported By: Dr. Anne L. Grauer, Department of Anthropology; CURA Scholar Program

Chagas Disease is a tropical parasitic infection most commonly affecting the Americas, it is estimated that 70 million individuals reside in areas of exposure and are at risk of contracting it. To help people stay informed and gain insight into how pathogens infect hosts in tropical and rural areas, a comprehensive literature review into the history, geographic distribution, life cycle, and pathophysiology of the disease was conducted. The goal is to provide a guide that will aid in identifying transmission routes, such as insects, ingestions, or medical procedures, as well as any methods of prevention and management of the disease.

◆ Poster 137 ◆

***Dietary Reconstruction of the Nunavut Territory***

Presented By: Sandra Rankic; Mulcahy Scholars Program

Supported By: Dr. Kristin Krueger, Department of Anthropology

A Northern Territory of Canada, known as Nunavut, is home to the aboriginal Sadlemuit Inuit. Indigenous communities such as this one suffered a lot. They have faced genocide, colonialism, and assimilation practices in the Euro-centric West, including Canada and the United States. More recent approaches to anthropology have been focusing on providing these communities with information about their ancestors' lifeways and traditions. However, despite the importance of this information, the previous work has not yet fully explored the direct means of dietary reconstruction. Therefore, this study aims to shed light on Nunavut Territory's food and dietary culture by examining dental microwear.

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◆ Poster 138 ◆

***The Role of Hedgehog Signaling During Hemipene Development in A. Sagrei Lizards***

Presented By: Adriana Saliceti Galarza; Mulcahy Scholars Program

Supported By: Dr. Thomas Sanger, Department of Biology

In Genital development, mammals are a rigorously studied species. They are species that have a single midline phallus. In contrast, Squamates have paired lateral hemipenes. Although their phenotypes are different, their initial stages of genital development are the same. This process is characterized by paired genital swellings that expand toward the midline of the embryo. The purpose of this research is to provide a wider understanding of the development of hemipenes in *A.sagrei*. What is known regarding both processes are the general signaling pathways. Our focus for this investigation is how Sonic hedgehog affects *A.sagrei* hemipene development when knocked out.

◆ Poster 139 ◆

***A Dynamic Model of PI3K/AKT/PTEN Signaling in Microglial Pathological Phenotype Prediction***

Presented By: Rohan Sethi; Mulcahy Scholars Program

Supported By: Dr. Peter Kekenos-Huskey, Department of Physiology

Macrophages are a type of white blood cell involved in innate immune responses, during which macrophages can phagocytose (ingest) microorganisms or cellular debris. We are interested in studying microglia, which are the macrophages of the central nervous system, and computationally model the PI3k/Akt pathway, a canonical biochemical pathway involved in polarizing microglia between the M1/M2 phenotypes. Insights gained from this model will bridge disparate perspectives on macrophage function in health and central nervous system diseases.

◆ Poster 140 ◆

***Exploring Bacterial Strain Diversity in the Asymptomatic Urinary Microbiome***

Presented By: Niru Shanbhag

Supported By: Delaney Sauer, Department of Biology; Dr. Catherine Putonti, Department of Biology; NIH (National Institutes Of Health)

Our research explores bacterial strain diversity in individuals without lower urinary tract symptoms. Instead of 16S sequences, we used shotgun metagenomic data, which encompass all genomes in a microbial community. Metagenomic samples from publicly available urobiome databases were analyzed using Strain Resolution ON Graphs (STRONG), which identifies haplotypes across samples. We identified the taxonomy of these haplotypes by developing a python script. Among 61 metagenomic samples, we detected strain diversity in 13.1% samples,

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most frequently identifying strain diversity of *Escherichia coli* (50%). Strain diversity was also observed in *Gardnerella vaginalis*, *Psychrobacter* sp., *Ralstonia* sp., *Acinetobacter lwoffii*, and *Actinotignum schaalii*.

◆ **Poster 141** ◆

***Synthesis and Characterization of Co(II) NNN Pincer Complexes***

Presented By: Graden Snyder; Mulcahy Scholars Program; Provost Fellowship

Supported By: Dr. Wei-Tsung Lee, Department of Chemistry and Biochemistry; Teddy Gerard, Department of Chemistry and Biochemistry

Several new Co(II) complexes supported by NNN pincer ligands are reported. One of these is the latest addition to a series of analogous complexes with late first-row transition metals. Chemical oxidation of this complex led to the unprecedented, cobalt-facilitated C-C coupling of pyrazole moieties.

◆ **Poster 142** ◆

***Communication for Alzheimer's Treatment Success in Healthcare Interventions with Education (CATHIE)***

Presented By: Danielle Swenson; Carroll and Adelaide Johnson Scholarship

Supported By: Dr. Lindsey Garfield, Marcella Niehoff School of Nursing, Candace Carroll, BSN

Limited resources exist for families of Alzheimer's patients. Associations such as the Alzheimer's Association provide resources for families about financial planning and talking to neurology clinicians. Yet, there is a significant lack of resources and support for navigating other healthcare appointments such as the dentist, who may not have worked with a patient with middle to late-stage Alzheimer's. The CATHIE intervention is designed to educate family members of Alzheimer's patients on effective communication strategies to improve non-neurological healthcare appointments. Additionally, it aims to improve family knowledge, confidence, and patient experiences thus improving the lives of Alzheimer's patients and their families.

◆ **Poster 143** ◆

***Assessing Biochar's Ability to Curb Road Salt Pollution in the Great Lakes***

Presented By: Kristina Tsakos; Carbon Undergraduate Research Fellowship Program

Supported By: Team Typha, Dr. Brian Ohsowski, Sam Schurkamp, Shane Lishawa, School of Environmental Sustainability

Road salt pollution in the Great Lakes region has been increasing in aquatic systems due to road safety concerns. Biochar, the by-product of heating organic waste in low oxygen environments, is a soil amendment that improves terrestrial systems with degraded saline soils. In aquatic systems with highly saline water infiltration, biochar's role as a salt adsorption filter has not been



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assessed. In this study, I investigated biochar's capacity to filter Na<sup>+</sup> & Cl<sup>-</sup> ions from a saline solution. Hypothesis: Treatment buckets with 50% Sand / 50% biochar will significantly adsorb more Na<sup>+</sup> and Cl<sup>-</sup> ions compared to 100% sand buckets.

◆ Poster 144 ◆

***Stress Response in Invasive Aquatic Invertebrates After Exposure to Chicago River Water***

Presented By: Sydney Ware; SES Undergraduate Research Fellowship

Supported By: Dr. Reuben Keller, Natalia Szklaruk, School of Environmental Sustainability

The Chicago Area Water System (CAWS) connects the Great Lakes to the Mississippi River Basin and is a pathway for aquatic invasive species traveling between these ecosystems. Due to anthropogenic pollution, CAWS water may be a barrier to the movement of some species. We exposed bloody red shrimp (*Hemimysis anomala*) and red swamp crayfish (*Procambarus clarkii*) to CAWS water. After exposure, catalase levels - an indicator of physiological stress - were tested. Catalase increased significantly in bloody red shrimp, indicating that CAWS water quality may prevent its spread. Red swamp crayfish catalase levels did not increase, consistent with them living throughout the CAWS.

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# UNDERGRADUATE RESEARCH IN DANCE: *MURMURATION OF STARLINGS*

MUNDELEIN, 409

11:30 AM - 12:15 PM

*Dr. Amy Michelle Wilkinson, PhD.*

## PERFORMERS

- ❖ Caroline Cady
- ❖ Caitlin Dyer
- ❖ Isabel Goetzke
- ❖ Emily Heier
- ❖ Zoe Holland
- ❖ Caroline McLoughlin
- ❖ Sydney Osborne
- ❖ Ainsley Pew
- ❖ Gretchen Plinke
- ❖ Cayla Skuran
- ❖ Miller Tennant
- ❖ Ariana Vadhera



*Preparing people to lead extraordinary lives*

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# Oral Presentations

12:45 PM – 1:45 PM

## ◆ Mundelein 204 ◆

### ***Photosystem Balancing and WOC Efficiency in Response to Trophic Switches and Temperature During the Diurnal Cycle***

Presented By: Luke Sharpe

Supported By: Dr. Colin Gates, Department of Chemistry and Biochemistry, Debashish Bhattacharya, Distinguished Professor, Rutgers University

The red alga *Galdieria sulphuraria* is capable of growth under autotrophic, heterotrophic, and mixotrophic conditions. It is thus a suitable model for determining the metabolic regulatory processes underlying the decision for which trophic mode to live under when faced with variable conditions. We challenged cultures of *G. sulphuraria* with one of three sugar conditions: no sugar (-G), glucose (+G), or lactose (+L); and diurnal light or constant darkness and observed expression and behavior of the photosystems during the diurnal cycle at 30°C.

Spectrophotometry and 77K spectrofluorometry were used to find pigment concentration and PSI/PSII fluorescence ratios to compare photosynthetic activity to pigment expression. +G was shown to dictate photosynthetic apparatus behavior through modulating PSI/PSII production/degradation.

### ***Trophic Modes in *Galdieria sulphuraria* at 42°C***

Presented By: Kishan Bharwad

Supported By: Dr. Colin Gates, Assistant Professor, Department of Chemistry and Biochemistry, Julia Van Etten, Graduate Student, Rutgers University; Debashish Bhattacharya, Distinguished Professor, Rutgers University

*Galdieria sulphuraria* is an extremophilic red alga that preferentially resides within hot springs of temperatures ranging from 30°C to 50°C and a pH around 2. *Galdieria sulphuraria* commonly exhibits a symbiotic relationship with the red alga *Cyanidioschyzon merolae*, however it is also capable of living independently as an autotroph, making it a flexible candidate for consortium biofuel and product processing. We examined the role of sugar availability on the photosynthetic apparatus in *G. sulphuraria* over the diurnal cycle at an optimal symbiont growth temperature of 42°C. Our findings indicate a dramatic shift in PSII/PSI expression throughout the diurnal cycle.

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♦ Mundelein 204 ♦

***Engineering a Förster Resonance Energy Transfer (FRET) Biosensor Specific to GABA with GabR***

Presented By: Desha Perera; Carbon Undergraduate Research Fellowship Program

Supported By: Dr., Dali Liu, Department of Chemistry and Biochemistry; Dr., Tatiana Esipova, Department of Chemistry and Biochemistry; Sara Abuhadba, Department of Chemistry and Biochemistry, graduate student; Nick Kaley, Department of Chemistry and Biochemistry, graduate student; Abigail Vargas, Department of Chemistry and Biochemistry

Neurological disorders are of predominant concern in the medical field today. Disorders such as epilepsy and schizophrenia have been linked to an imbalance of the fundamental neurotransmitter Gamma-aminobutyric acid (GABA) which is responsible for the balance of inhibitory and excitatory signals in the brain. We propose creating a sensor with high spatial and temporal resolution that will be sensitive, reversible, and selective for GABA by utilizing the protein GabR. The binding of GABA will cause conformational changes in GabR which can be translated into a change in fluorescence intensity by means of Forster Resonance Energy Transfer. The changes in intensity will be monitored by the two fluorophores Pyridoxal-5'-phosphate (PLP) and Cyanine 3 (Cy3) dye. PLP will serve as the donor while Cy3 will serve as the acceptor.

♦ Mundelein 205 ♦

***49th Ward Internship Experience***

Presented By: Zoe Ashcraft

Supported By: Dr Eric Hansen, Department of Political Science

The 49th Ward Office has proven to be an excellent source of internship experience. While mainly handling phones and constituents coming into the office, each day looks different from the last. Each concern/question is unique. This requires adaptation to each situation in order to help the individual with their needs. By getting hands-on experience, one can learn a substantial amount about local governance along with improving communication and teamwork skills.

***Politics from a New Perspective***

Presented By: Katie Golson

Supported By: Dr. Eric Hansen, Department of Political Science, Jessica Papp

This will be a presentation covering my academic internship with the 44th ward service office. It will cover the skills I've learned, and the lessons taught to me about navigating Chicago politics. It will also cover how the concepts I learned in classes here at Loyola connect to the career path I hope to pursue.

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◆ Mundelein 205 ◆

***Juvenile Justice***

Presented By: Lina Househ

The Juvenile Justice Center is not just a place to prosecute kids, it is a place that provides them with safe and humane temporary custody while pending court proceedings. It also aims for rehabilitation to prevent further delinquent behavior through the development of educational, social, emotional, and basic life skills which enable youth to grow and mature.

◆ Mundelein 303 ◆

***Does Political Instability Foster Terrorism? A Qualitative Analysis from 2000-2019***

Presented By: Eileen DeGuire

Supported By: Dr. Michael Schumacher, Department of Political Science

This study examines the relationship between domestic political instability and terrorism. Using an original dataset and global news sources, we conduct four comparative case studies to investigate the extent to which political instability within a country is associated with the number of terrorist attacks it experiences: Saudi Arabia, Nigeria, Chile, and the United Kingdom. We find that while there is a positive correlation between domestic political instability and terrorism, the mechanism driving the relationship depends on the country's regime-type. Stable democracies and authoritarian governments tend to experience lower levels of terrorism, whereas countries experiencing political transition experience far greater levels.

***Violent Mediation: A Study of the Impact of Terrorism in U.S. Diplomacy***

Presented By: Addison Emig; Provost Fellowship

Supported By: Dr. Michael Schumacher, Department of Political Science

Between 1970 and 2019, the Global Terrorism Database identified 555 terrorist attacks against U.S. diplomatic missions. Using qualitative and quantitative techniques, I analyze this data to address why terrorists target U.S. diplomatic missions, the security impact these acts of terror have on those missions, and how terrorists respond to the changing security environment. I find terrorists strategically targeted U.S. diplomats between 1970 and 1998 because they are softer targets than military options yet still high profile. In response, the U.S. slowly improved diplomatic security with the 1998 East African Embassy bombings serving as a major turning point. Terrorists responded to increased security by adapting their target selection to softer targets - civilians. As a result, when terrorism spiked in 2011, there was no corresponding increase in the number of attacks against U.S. diplomats.

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◆ Mundelein 303 ◆

***Political Radicalism on Social Media***

Presented By: Jordan Hamrick; Provost Fellowship

Supported By: Dr. Michael Schumacher, Department of Political Science

Social media platforms use interest-based algorithms that reflect an individual's beliefs and opinions back at them in order to keep them engaged on the platform. It creates a funnel-like experience that can lead to more and more extreme content. This study analyzes the relationship between the amount and type of social media use and individuals' attitude toward extremist ideas. Results from 620 survey participants indicate a correlation between viewing and engaging with politically radical content on social media and an agreement with politically radical ideas. This study also shows a general acceptance of politically radical content on social media platforms.

◆ Mundelein 304 ◆

***Zen Buddhist Temple of Chicago***

Presented By: Matthew Buljubasic

Supported By: Dr. Yarina Liston, Department of Theology

The Zen Buddhist Temple of Chicago is a temple of Soto Zen that is committed to aiding disciples in recognizing their genuine essence through the practice of Zazen, a type of meditation done in a seated posture.

***Buddhism in Chicago***

Presented By: Thanasi Michalakakis

Supported By: Dr. Yarina Liston, PhD, Advanced Lecturer, Department of Theology

Based on my studies regarding Buddhist tradition and a visit to a Buddhist site, I will display and discuss how Buddhism lives in Chicago.

***Buddhist Temple of Chicago - Engaged Learning Project***

Presented By: Margaret Cronin

Supported By: Dr. Yarina Liston, Department of Theology

I will address the history of this Buddhist temple and my experience visiting it.

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## ◆ Mundelein 308 ◆

### ***Analysis of U.S. Air Force ROTC Cadets Physical Fitness Profile***

Presented By: Aly Rahmatullah Caitlin Tarpey

Supported By: Cameron S. Mackey, PhD, TSAC-F, Applied Health Sciences

We analyze the current physical fitness and create an updated physical fitness profile among U.S. Air Force ROTC cadets, while also comparing the ROTC cadet's performance to the gender- and age-matched normative values established from the ACSM Guidelines for Exercise Testing and Prescription. Based on these findings, it appears the U.S. Air Force PFA scores do not fully translate over to one's general physical fitness, potentially due to lacking major components of physical fitness, such as flexibility and muscular strength. As the ROTC cadets only participated in mandatory training twice per week during the academic year, it seems apparent that they are specifically training towards passing the PFA components.

### ***Healing Landscapes of Water, Sanitation and Hygiene Trauma Through Wetland Restoration and Autoethnography***

Presented By: Dakota Lane; John Grany Fellowship in Bioethics

Supported By: Mx. Justin Wright, FCIP, Dr. Laura Brentner, SES, Dr. Thomas Derdak, Department of Philosophy

Extreme climatic changes are increasingly present in Chicagoans' lives, including at Loyola University Chicago. Community members report a multiplicity of hardships indicative of a syndemic Water, Sanitation and Hygiene (WASH) crisis. These failings are further contextualized in the wake of Cook County's legacy of poor water management grossly endangering and damaging marginalized communities. This thesis details and maps geotrauma derived from WASH issues endured by the marginalized Loyola Community; serves as an intervention to institutional negligence within critical theory and decolonial ethics; enforces university obligations of water security through on-campus wetland restoration, under an Department of Homeland Security based framework.

### ***Chicago Foodshed Mapping Project***

Presented By: Rakayla Campbell

Supported By: Dr. Tania Schusler, School of Environmental Sustainability, Dr. Howard Rosing of DePaul University

This research is called The Chicago Foodshed Mapping Project. The aim of this research is to connect BIPOC growers within Cook and surrounding counties to institutional food procurement supply chains to become suppliers. This will include evaluation of current sustainable purchasing initiatives while developing relationships with growers using ethnographic research methods. Growers will be located and interviewed to better understand their motivations for their work, potential capacity, and interest in becoming part of regional food buyers and sellers. We hope to

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understand their needs in order to support historically marginalized communities while strengthening the midwestern foodshed, making nutritious food more accessible in the region.

### ◆ Mundelein 403 ◆

#### ***Socioeconomic Status, Childhood Trauma, and Attention-Deficit/Hyperactivity Disorder***

Presented By: Nina Frankovic

Supported By: Dr. Zoe Smith, Department of Psychology

Studies have shown correlations between attention-deficit/hyperactivity disorder (ADHD) & childhood trauma (CT), ADHD & socioeconomic status (SES), and CT & SES. This study contains a scoping review of literature investigating these three associations.

#### ***Exploring the Impact of Exposure to Age Groups on the Development of the Other-Race Effect in Infancy While Assessing the Qualities of Online and In-Person Data Collection***

Presented By: Nhi Duong; Provost Fellowship

Supported By: Dr. Margaret Guy, Asli Bursalioglu, Department of Psychology

At just 3 months of age, the other-race effect (ORE) develops, manipulated by unequal exposure to racial groups, impacting facial recognition of the individual's own race or faces of racial groups to which there is more exposure and processes them easily compared to different or "other" races. It's unclear whether infants' looking behavior has a correlation to the age of faces being analyzed. We conducted a visual-paired comparison experiment to examine 12-month-old infants' gaze behavior towards adult female or adolescent same- and different-race faces. Additionally, we compare the quality of in-person laboratory data collection and Look-It platform for online data collection.

#### ***The Contribution of Attention-Deficit/Hyperactivity Disorder Symptom Severity to Nightmare-Based Dreams***

Presented By: Julianna Collazo Vargas

Supported By: Zoe R. Smith, Ph.D., Department of Psychology

Although there is minimal research on dream studies regarding people with ADHD, most people with ADHD report sleep problems affecting their daily lives. The lack of consistency in sleep can lead to poor health outcomes. To date, only the Schredl et al. 2016 study has examined nightmare experiences for people with ADHD without taking into consideration the comorbidity of PTSD symptoms. This study examines the influence of ADHD symptom severity on the occurrence of nightmare-based dreams while including PTSD symptoms as a covariate, seeing as nightmares are a part of the diagnostic criteria for PTSD.



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## ◆ Mundelein 404 ◆

### *Hypnotherapy*

Presented By: Caroline McLoughlin

Supported By: Dr. Amy Wilikinson, Department of Dance

A dance film that explores ideas of control over self and over others. The concept came after I listened to the song "No Control" by Trash Panda. I wanted to dig into the ideas of control and power under the umbrella of hypnosis and other things like intrusive thoughts, for example, that I find to be things to fear.

### *Advancements in Scenic Design*

Presented By: Bobby Barnett

Supported By: Justin Snyder, Technical Director, Department of Fine and Performing Arts.

Between March 15 and March 19, 2023, I had the opportunity to attend the 2023 USITT Conference & Expo, where new and upcoming advancements in theatrical technologies were showcased to over 5,000 attendees. Over the course of the week, I both staffed and attended numerous panels, demonstrations, and workshops. These spaces not only expanded my current knowledge of theatrical technologies, but also provided stepping stones for not only my future, but the future of all scenic designers and technical directors.

## ◆ Mundelein 406 ◆

### *The Effect of Ribbon Overexpression on Somatic Follicle Cell Proliferation*

Presented By: Amanda Swedrowski; Mulcahy Scholarship Program

Supported By: Dr. Jennifer Mierisch, Department of Biology

Ribbon (rib) is a transcriptional factor expressed in somatic gonadal precursor cells which coalesce with primordial germ cells to form the premature gonad in *Drosophila*. The Mierisch lab has found supporting evidence that rib overexpression leads to an overall decrease of somatic follicle cells (SFCs), causing a premature arrest in oogenesis. This study investigates if the reduction of SFCs are linked to a decrease in mitosis when levels of Rib proteins increase. We used the Gal4/UAS system to induce overexpression of Rib in the female *Drosophila* gonad, and we used immunohistofluorescence staining to analyze the extent of SFC proliferation.

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◆ Mundelein 406 ◆

***Characterization of the Role of Notch in Drosophila Testes***

Presented By: Christine Severude; Carbon Undergraduate Research Fellowship Program

Supported By: Dr. Jennifer Mierisch, Department of Biology, Dr. Heather Wheeler, Department of Bioinformatics

The process of gonad development and gametogenesis is crucial for the propagation of our species and the conservation of biodiversity. The gene Notch plays an important role in these processes. The goal of this experiment is to determine the transcriptional targets of Notch in the testes through RNA-sequence analysis, bioinformatics, immunohistochemistry, and in situ hybridization. These target genes will help us understand the process and regulation of spermatogenesis in *Drosophila* and across animal phyla. It will also pave the way for future research endeavors exploring the function of identified target genes. These genes could represent therapeutic targets for infertility.

***Gene Annotation of Akt in Drosophila Persimilis***

Presented By: Julia Kaniuk; Biology Research Fellows Program

Supported By: Dr. Jennifer Mierisch, Associate Professor, Department of Biology

Examination of gene conservation across species can yield divergence patterns in vital cellular processes. The main goal of this project is to determine how well members of the insulin pathway are conserved across *Drosophila* species. *Drosophila persimilis*, the primary species investigated in this project, diverged from the melanogaster group about 25 mya, implying increased divergence between *D. melanogaster* and *D. persimilis*. Using synteny to the well-characterized *D. melanogaster* genome and *D. persimilis* sequencing data, we were able to map the likely location of Akt in *D. persimilis*. Subsequently, we have investigated conservation of Akt in additional four *Drosophila* species.

◆ Mundelein 407 ◆

***The Role of the Drosophila Fat Body in Circadian Rhythms and Metabolism***

Presented By: Taylor Stephenson, Charlene Guerrero; Mulcahy Scholars Program

Supported By: Dr. Daniel Cavanaugh, Associate Professor, Department of Biology, Dr. Sumit Saurabh, Faculty and Postdoctoral Scholar, Department of Biology

*Drosophila Melanogaster* circadian oscillations are dictated by a central brain clock. This clock provides outputs to peripheral tissues which dictate many behavioral and physiological processes. The *Drosophila* fat body, analogous to the human liver and adipose tissue, is one of these outputs and may play a role in circadian metabolic rhythms. By determining how the central brain clock and peripheral tissues interact, physiological processes such as metabolism

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and energy storage can be better understood. To study these connections, metabolomics and transcriptomics of the fat body were performed. These studies will shed light on the oscillation of metabolites and their relation to the circadian cycle.

◆ **Mundelein 407** ◆

***Cross-Study Evaluation of the Relationship between the Human Gut Microbiome and Heart Disease***

Presented By: Anna Ali; Biology Summer Research Fellowship; Mulcahy Scholars Program  
Supported By: Dr. Michael B. Burns, Department of Biology

The human microbiome is a community of microorganisms that operate as a "hidden organ" to regulate healthy immune function and other beneficial effects. Recent studies have assessed the relationship between the gut microbiome and heart disease. Our work is a critical evaluation of these findings. The field of microbiome research is rapidly evolving and known biases exist. Reassessment using modern best practices and available databases can clarify the relationship between heart disease and the gut microbiome. This work may aid future translational work on the topic.

***Characterization of TrxT and Dhd in the Fruit Fly Drosophila Melanogaster***

Presented By: Samantha Webster; Mulcahy Scholars Program; Provost Fellowship  
Supported By: Dr. Stefan Kanzok, Department of Biology; Manny Widuch, Graduate Student, Department of Biology

The thioredoxin (Trx) system is a central biochemical pathway that regulates different aspects of cellular mechanisms in all organisms. We recently identified Phosducin-like-protein 3 (PhLP3) in *Drosophila* which plays a key role in sperm development. We hypothesize that PhLP3 is regulated by the Trx system. Investigations into the fruit fly database have revealed two germline-specific thioredoxin proteins. We hypothesize that the novel germline-specific protein called PhLP3 which is involved in sperm development may be regulated by the Trx system. Here I characterized the two novel thioredoxin proteins TrxT and Dhd.

◆ **Mundelein 408** ◆

***Exploration of Player Nationality in European Football***

Presented By: Caleb Frank, Chris Burns, Joey Raad, Danny Umar  
Supported By: Dr. Anne Reilly, Business Marketing

There are an estimated five billion soccer fans in the world, making it the most popular sport in the world (FIFA). This worldwide popularity has brought about a trend of globalization that can be most easily seen in the nationality of players and origin of social media interactions in

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Europe's top leagues. To test the relationship between these two variables, a differential analysis was performed with the results proving to be inconclusive. The differential analysis found there to be an average difference in nationality and origin of interactions, or mentions, of 39.37 percentage points for the five leagues in the 2021-2022 season. This suggests that a relationship between player nationality and origin of social media interactions potentially exists but also requires consideration of other factors. The insights gained from this research reflect on European soccer and offer implications that can be used by various stakeholders of this successful business.

♦ Mundelein 408 ♦

***The Correlation between Environmental, Social, and Governance "ESG" and Stock Performance***

Presented By: Harley Thursby, Catie Plank, Ariel Nudman, Abby Layton

Supported By: Dr. Anne Reilly, Business Marketing

This research aimed to observe the correlation between ESG and value to investors by comparing stock price change and return on invested capital of 10 "sustainable" companies, as defined by the S&P 500 ESG Index, and 10 non-ESG companies headquartered in the US across five of the eleven stock market sectors. Secondary data was found using Mergent Online, company 10-Ks, Yahoo Finance, and Refinitiv Eikon. The results showed no findings, meaning that we cannot draw conclusions about the value of ESG to investors from our sample. We believe continued research with fewer limitations may be able to identify a correlation.

***Council of International Programs in Chicago***

Presented By: Daniel McRaven

Supported By: Cherly McPhilimy, School of Communication, Executive Director Dr. George Palamattam and Program Coordinator Karol Nowak

Council of International Programs in Chicago is a non-profit international educational exchange program, committed to promoting international understanding through professional development and cross-cultural exchange. CIP Chicago is an affiliate of CIP USA, which was founded in 1957 to promote cross-cultural exchange between the U.S. and post war Germany. Over the years CIP has brought nearly 10,000 international professionals from 147 countries to the United States for practical training.

***Mellon Unpaid Academic Internship Award Presentation- Enes Eldes***

Presented By: Abdullah Eldes

I was the recipient of the Mellon Unpaid Internship Scholarship Award for my experience as a graphic designer intern at KCommunications, a public relations and marketing agency based in Chicago. My presentation will go over my internship responsibilities as well as projects that I was associated with.

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## ◆ Mundelein 409 ◆

### ***Undergraduate Research in Dance: Murmuration of Starlings***

Presented By: Ainsley Pew, Caroline Cady, Caitlin Dyer, Isabel Goetzke, Emily Heier, Zoe Holland, Caroline McLoughlin, Sydney Osborne, Gretchen Plinke, Cayla Skuran, Miller Tennant, Ariana Vadhera; Provost Fellowship

Supported By: Dr. Amy Wilkinson, Department of Dance; Mandala Dance Company

Undergraduate Dance Majors from Loyola University Chicago's (LUC) Department of Fine and Performing Arts (DFPA) and professional dance artist and faculty member Amy Wilkinson create and perform original danceworks on a program entitled Murmuration of Starlings that explores the kinesthetic representation of flight and an exploration of the concept "safety in numbers." The finished product includes contemporary movement vocabulary crafted into a large-scale choreographed piece. The creative process involves collaboration between the LUC dance artists and professional performance troupe, Mandala Dance Company. The project addresses the problem of sharing and reflecting culture in the body, as well as contemporary design principles, and the reading of choreography as "text." Murmuration of Starlings investigates discipline specific modes of inquiry and involves the creation and crafting of dance movement as well as writing exegeses. As a performance piece, Murmuration of Starlings is an example of practice-led performative research, which draws on subjective, interdisciplinary, and emergent methodologies to generate new knowledge.

## ◆ Mundelein 414 ◆

### ***Taking Climate Action for a Resilient Campus***

Presented By: Ben Soden Ruth Cabrera, Ashley De La Rosa, Elizabeth Bieniek, Laura Shields

Supported By: Dr. Aaron Durnbaugh, Director of Sustainability

Global warming is associated with added stressors on business functioning and safety. We seek to address institutional resilience and business continuity in the face of climate change. Our project scope is the Lakeshore campus of Loyola University of Chicago. We formulated recommendations for Loyola's climate business continuity plan by gathering statistics on global warming indicators and applying them to Loyola's Lakeshore campus. We assert that the university must adapt by implementing procedures to reflect the rapidly changing climatic conditions.

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◆ Mundelein 414 ◆

***Sustainable Urban Agriculture***

Presented By: Bailey Uttich

Supported By: Kevin Erickson, Sustainable Agriculture Senior Manager, School of Environmental Sustainability

Loyola's Sustainable Urban Agriculture program (Urban Ag) provided me with experiences in hydroponics, aquaponics, indoor mushroom cultivation, outdoor farming, and selling produce at a farmer's market. Sustainable agriculture techniques are becoming increasingly important globally with growing population and rising food insecurity as a result of the pandemic. Urban Ag completely changed my preferred career path and introduced me to so many like minded people. My experience as an Urban Ag intern was so valuable to me that I applied for a paid position in the program where I now lead groups of interns in hydroponics production and maintenance.

***Landfill Diversion as a Viable Climate Change Solution***

Presented By: Selena Lynch

Supported By: Dr. Chris Peterson, Associate Dean for Academics & Professor  
School of Environmental Sustainability Melinda Avellino, Earth Day Everyday Chair

Waste contributes significantly to greenhouse gas emissions, exacerbating the climate crisis. Waste management infrastructure in the United States is poor and underfunded. More education about low-waste methods is needed. My project, in collaboration with Earth Day Everyday, a nonprofit organization in New York, investigated the scope of landfill diversion as a climate change solution. They held their first annual Earth Day Everyday Festival in 2022, with over 30 exhibitors, 9 speakers, and many organic food vendors, all with the intention of continuing the conversation about sustainability and circularity. This year, I supported the planning, promotion, and execution of their festival.

◆ Mundelein 415 ◆

***How Social Media Discourses Shape Gendered Stereotypes of Women Entrepreneurs?***

Presented By: Caitlin Osei; Social Justice Fellowship

Supported By: Dr. Jenna Drenten, Marketing; April Lane, Department of Entrepreneurship

This project employs feature engineering, content, and sentiment analysis from sixty-one various women entrepreneurs across a range of social media platforms. The media channels predominately are Instagram, TikTok then Twitter, respectively. The analysis highlights what linguistic choices women entrepreneurs use in their social media captions. The captions are also classified based on their framing of women's entrepreneurship. Taking an analytical gaze at these linguistic choices may open a space to understand the gendering stereotypes of women in entrepreneurship. The impact of this research aims to create a more equitable social environment.

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♦ Mundelein 415 ♦

***Professional Workwear and the Decline of Religious Influence in Public Spaces - Basque Country and the United States***

Presented By: Christin Layton, Megan Fowler, Grace Finegan

Supported By: Amy Kyhos, Executive Lecturer, Department of Management

This study compares and contrasts two distinctive cultural and professional areas between the Basque Country and the United States. Specifically, it examines workwear culture in professional spaces, as well as religious influence within public areas in both regions. Data regarding these two topics was collected through in-person observation and extensive research.

***Hinduism***

Presented By: Emily Gahgan

Supported By: Iskcon

I will talk about the ins and outs of everyday Hindu life.

♦ Mundelein 503 ♦

***Focusing on Early Childhood Education: The Importance of Investing in the Early Years of Learning***

Presented By: Kaitlyn Rokusek

Supported By: David Castro, Professor, Department of Education

Illinois has paved the way for supporting our state's youngest learners. In 2023, Governor JB Pritzker announced the SMART Start Illinois: A Nation-Leading Investment in Childcare. The bill's main focus is supporting families with children birth to 5 years old across the state by investing \$250 million dollars. To continue to invest in the early years of learning, continued effort needs to be placed on Early Childhood Education in state policy.

***An Examination of the Extent to Which the Religious Affiliation of Politicians, both Muslim and non-Muslims, Impacts Anti-Semitic Branding***

Presented By: Deena Al-Ali; Carroll and Adelaide Johnson Scholarship

Supported By: Dr. Jennifer Forestal, Department of Political Science

The acronym PEP, Progressive Except for Palestine, has been used to criticize members of the American left who take progressive stances on certain issues, (i.e., recognizing human rights violations, systemic racism, land belonging to the indigenous community, etc.) but fail to recognize those same issues in the context of the Palestinian-Israeli conflict. Conversely, although the sample size is egregiously low, Muslims elected to office who voice public support for the Palestinian cause have been the target of Anti-Semitic branding from both sides of the

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aisle. This undue reputation is often informed by the conflation of Anti-Semitism and Anti-Zionism, and is especially detrimental to the Muslim community, already a highly targeted religious minority in America. I seek to explore and compare the treatment of Muslim public officials and their non-Muslim counterparts to further explore the relationship between anti-Semitism and anti-Zionism as it relates to this specific population, and subsequently, the reception and rhetoric to those same platforms.

◆ Mundelein 503 ◆

***Facebook's Oversight Board: Pluralist, Democratic, and Deliberative Perspectives***

Presented By: Elizabeth Joka

Supported By: Professor Abraham Singer, Business-Management; Dr. Jennifer Forestal, Department of Political Science

We consider the decisions of Facebook's Oversight Board through the lenses of legal pluralism, democratic theory, and public reason, in order to better understand the normative dynamics of institutions and authority beyond the formal state apparatus.

◆ Mundelein 504 ◆

***Women and Technology***

Presented By: Roselien Christian

Supported By: Dr. Robert Yacobellis, Computer Science

I will be presenting about how women should also consider a career in technology since it is mostly a male-dominated field.

***Queering the Convent***

Presented By: Isabella Cook; Social Justice Fellowship

Supported By: Dr. Colby Dickinson, Department of Theology

Evolving discourse on queerness from both secular society and the Catholic Church cannot obscure the reality that queer women have always been present within the Church's avowed ranks. Insofar as queerness is defined as divergence from cisheteropatriarchal normativity, as derived from Church doctrine and teaching regarding gender and sexuality, my research seeks to prove that women religious of the Catholic Church inhabit non-normative roles and therefore dwell within a certain space of queerness. Discussions include cisheteropatriarchy as religious ideology, modern scapegoating's focus on queer women in the Church, and queerness's continuous presence among the Church's ranks.



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◆ Mundelein 504 ◆

***Feminism and Forgiveness: How Catholic Women Respond to Gender-Based Microaggressions***

Presented By: Arden Schultz; Carroll and Adelaide Johnson Scholarship; Social Justice Fellowship

Supported By: Dr. Aana Marie Vigen, Department of Theology

In this small, qualitative study, the author used semi-structured participant interviews to explore how women-raised-Catholic experience forgiveness (or lack thereof) in response to gender-based microaggressions.

◆ Mundelein 506 ◆

***Program and Development Internship at Bear Necessities Pediatric Cancer Foundation***

Presented By: Adriana Monarrez

Supported By: Mary Czulno, Parkinson School of Public Health and Health Sciences

I am a Program and Development Intern at Bear Necessities Pediatric Cancer Foundation. Our primary goal is to inspire hope and joy within children battling cancer while supporting the entire family during one of the most challenging times of their lives. This internship provides me with the opportunity to assist with development and event tasks, and research a directory of resources that can be distributed to families with children in treatment for pediatric cancer. Lastly, I assist with Bear Hug program tasks, including contacting families, sending out packages, and assisting in planning a virtual program for the Bear Hug recipients.

***Identifying a Brief Quality Diet Assessment***

Presented By: Liz DeLoreto Elle Beach, Liz DeLoreto, Joaquin Guzman, Tatiana Pasewark, and Sara Ruiz

Supported By: Dr Sparkle Springfield, Dr Justin Harbison, Parkinson School of Public Health and Health Sciences

We aim to identify a brief diet quality index that evaluates the diet quality of young African American women (ages 18-35) by examining the association between the WELL Diet Score and the NutritionQuest Fruit, Vegetable, and Fiber Screener (FVF), within young, female African American participants.

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◆ Mundelein 506 ◆

***Strategies to Achieving National Standards of Healthcare Access: A Qualitative Analysis of Cook County Health System***

Presented By: Shoaib Haq Mateus, Sofia; Patel, Jaash; & Borowska, Julia

Supported By: Dr. Theresa Burkhardt, Mervin Dino, Parkinson School of Public Health and Health Sciences

The purpose of this study is to identify healthcare accessibility gaps in the Cook County Health (CCH) strategic plan for 2023 and use it to compare with Healthy People 2030 and The Commonwealth Fund to understand the correlation between the local, national, and international health metrics. This study aims to evaluate CCH's accessibility compared to national and international metrics. This analysis will provide a case analysis using HP30 and Commonwealth Fund metrics for county health access. Using these metrics by county healthcare systems can improve local access to healthcare, improving the U.S.'s HP30 performance and international ranking.

◆ Mundelein 507 ◆

***Campaigning on the Court: Congressional Campaign Ads and their Effect on U.S. Supreme Court Legitimacy***

Presented By: Sue Rieger; Provost Fellowship

Supported By: Dr. Amanda Savage, Department of Political Science

With the recent overturning of *Roe v. Wade* 410 U.S. 113 (1973), discourse surrounding the legitimacy of the U.S. Supreme Court has escalated dramatically. However views surrounding the Supreme Court's legitimacy have always permeated its way into the political arena through the development of media and advertising. In order to best understand why the Supreme Court is being questioned, we must examine when it occurs. To analyze media involvement in the legitimacy of the Supreme Court, I analyzed political candidate's use of Supreme Court issues and characterization of the court. My research specifically establishes the use of political campaign ads as a means to direct and change perceived legitimacy of the Supreme Court.

***An Analysis of the Effects of the War on Drugs and its Influence on the Prison Industrial Complex and Black Communities***

Presented By: Cicely Warren; Provost Fellowship

Supported By: Dr. Twyla Blackmond-Larnell, Department of Political Science

Throughout my research I have sought to go beyond a basic understanding of the prison industrial complex and instead find out the real costs of being a prisoner in state prisons. Through gathering data from various correctional facilities throughout the midwest and a careful analysis of each facility, my discoveries are less than shocking. African American populations

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continue to make up the majority of prison populations, and often are contracted out for labor that receives little to no compensation.

♦ **Mundelein 507** ♦

***Private Enterprise & Peace: Crime and Economic Reintegration in Urban Chicago***

Presented By: Michael Clausen

Supported By: Dr. Molly Melin, Professor, Graduate Program Director, Department of Political Science

Efforts to end conflict and reduce violence have included sustained investments in disarmament, demobilization, and reintegration (DDR). While policy analysts look at factors that contribute to successful DDR programs and debate the conditions that facilitate successful peacebuilding, there is limited information surrounding the factors that ensure successful reintegration at the microlevel. Examining the reintegration of ex-combatants and the formerly incarcerated offers a case study on the tools used to return to civilian life, across global contexts. This project aims to collect data on private sector support for DDR programs in Chicago to examine their relationship with local violence and peacebuilding.

♦ **Mundelein 508** ♦

***Heavy Metal Analysis of the Herbal Supplement Ginkgo Biloba***

Presented By: Madeline Collins; Mulcahy Scholars Program

Supported By: Dr. Martina Schmeling, Department of Chemistry and Biochemistry; Alyssa Tovar, Department of Chemistry and Biochemistry

Ginkgo Biloba is one of the most popular herbal supplements in the world. Recently there have been growing concerns of heavy metal contamination of the supplement due to the limited regulations imposed on them by the US Food and Drug Administration. Method development is in progress to identify and quantify heavy metals in various brands of liquid Ginkgo Biloba extracts. Spiked supplements are prepared using microwave digestion with 1:4 hydrogen peroxide and nitric acid. Flame Atomic Absorption Spectroscopy and Inductively Coupled Plasma Mass Spectrometry have detected trace amounts of lead. Future testing on liquid and capsule supplements will be done.

***Substrate Dependence of Carbonyl-Olefin Metathesis***

Presented By: Catherine Mudd; Mulcahy Scholars Program, Provost Fellowship

Supported By: Dr. Jim Devery, Associate Professor of Chemistry, Department of Chemistry and Biochemistry; Katie Siver, Department of Chemistry and Biochemistry

The formation of carbon-carbon bonds is of special importance in organic chemistry because of their widespread application. Carbonyl-olefin metathesis (COM) forms a carbon-carbon bond

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from a carbonyl-olefin pair. Catalysts like FeCl<sub>3</sub> can be added to improve the yield of the reaction, furthering COM's benefits. Though the mechanism has been studied, little work has been done to investigate how changes to the substrate impacts the progression of COM. Here, the substrate will be parameterized via computational and experimental methods. By comparing computational and experimental results, a wider understanding of the factors contributing to why certain substrates undergo COM can be acquired.

♦ **Mundelein 508** ♦

***Insight into the regulation of ADP-glucose pyrophosphorylase: Importance of homologous serines/threonines in the allosteric site***

Presented By: Thomas Bennett; Mulcahy Scholars Program

Supported By: Dr. Miguel A. Ballicora, Professor and Chair, Department of Chemistry and Biochemistry at Loyola University of Chicago; Gabriela Martinez-Ramirez, PhD candidate, Department of Chemistry and Biochemistry at Loyola University of Chicago

The enzyme ADP-glucose pyrophosphorylase (ADP-Glc PPase) is responsible for the production of ADP-glucose, the fundamental molecule in the production of starch in plants and glycogen in bacteria. This enzyme is regulated allosterically by various sugar phosphates specific to each model organism. Past studies have sought to better understand this enzyme by exploring different amino acid residues within the enzyme and how they affect its activity. Therefore, in our study we investigate the homologous residues Thr79 in *E. coli* and Ser65 in *Melainabacteria* to determine if they are critical for allosteric activation as we suspect them to be.

♦ **Mundelein 514** ♦

***Transgender and Gender Diverse Identity Development***

Presented By: Evelyn Pacifici

Supported By: Dr. Byron Brooks, Department of Psychology

The purpose of this study is to understand the experience of transgender and gender diverse identifying individuals' identity development; to understand how social media impacted their gender identity development; and understand how family members and religion impacted their gender identity development. We plan to use individual interviews with a sample of TGD college students for data collection. We will use thematic analysis rooted in a constructionist perspective to guide our analyses. Data collection is ongoing however we will present our findings highlighting the role of media, religion, and family on transgender and gender diverse identifying individuals.

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◆ Mundelein 514 ◆

***Understanding LGBQ Students' Perceptions of School Belonging and Academic Success***

Presented By: Elizabeth Rovegno

Supported By: Maryse Richards, PhD, Loyola University Chicago; Yael Granot, PhD;

Yelyzaveta DiStefano, MA

This study identifies mechanisms that explain discrepancies in perceived belonging and academic success among LGBQ and heterosexual high school students. Findings indicate that both discrimination and support each contribute to LGBQ students' safety perceptions, which predict belonging and academic success. Recommendations for creating inclusive educational spaces are further discussed.

***Effect of Medial Prefrontal Cortex Projection Inhibition on Drug-Induced Sensitization***

Presented By: Marko Koruna

Supported By: Dr. Stephan Steidl, Department of Psychology

Drugs of abuse have the ability to induce sensitization - an increase in drug-induced activation of dopamine neurotransmission in a forebrain called the nucleus accumbens. Changes in glutamate signaling in the ventral tegmental area (VTA) are critical for the development of sensitization. We have previously identified laterodorsal tegmental nucleus glutamatergic (LDTg) inputs to the VTA as necessary for the development of sensitization. The medial prefrontal cortex (mPFC) has been shown to be necessary for the development of sensitization and projects to the LDTg. In this research, optogenetics was used to inhibit mPFC inputs to the LDTg during cocaine exposure in mice.

◆ Mundelein 519 ◆

***Misericordia Personal Effectiveness (PEP) Internship***

Presented By: Rohan Sethi, Social Justice Internship

Supported By: Jorion Tucker, CELTS; Rachel Michels Director of PEP

As a personal effectiveness program (PEP) intern at Misericordia, I have had the opportunity to design and implement engaging programs that foster leisure and communication skill development that help residents learn soft skills necessary to engage in society. One project that I co-lead is Friday Morning Live, which is a program that involves residents to exercise their creativity and interpersonal skills by acting in skits of positive behaviors/actions and creating short films on those skits. Through this internship, I have learned strategies that can help dismantle the social injustices and prejudices that individuals with disabilities face.

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◆ Mundelein 519 ◆

***Perinatal Mental Health in Community Social Work***

Presented By: Stefanie Cobb

Supported By: Heather Watson, LCSW, Tiera McGary, MSW, LSW

A critical reflection on my internship engaging with underserved perinatal populations in and around the Belmont Cragin neighborhood, and the societal implications in terms of access, intersectionality, and reproductive justice.

***Equity Within Family Law and Social Work: Mellon Scholarship Award Presentation***

Presented By: Kate Dawson

Supported By: Virginia Torres Ryan, LCSW, JD Family Horizons Counseling PLLC

As a Clinical Social Work Intern at Family Horizons Counseling PLLC, I have had the opportunity to conduct research on high-conflict family law matters and concepts regarding reunification, abuse, and domestic violence. The mission of this agency is to provide sliding-scale low-cost services to individuals who are slightly over the income guidelines to qualify for free court services. In this role, I am responsible for the preparation of 604.10(b) reports, case management for custody and mental health evaluations, assisting with intervention methods and therapeutic activities for high-conflict parent and child relationships, and attending court room and client meeting observations.

◆ Mundelein 603◆

***Engineering Capstone Transfer Set***

Presented By: Jaad A'Rafat Sharf Abutaleb, Peter Saba, Chris Castillo

Supported By: Dr. Tom Johnson; Dr. Gail Baura, Engineering, Brian Connell

Peritoneal dialysis is a treatment that affects over 3 million people worldwide for end stage kidney disease. With sponsorship from Baxter, a medical device giant, a group of Loyola engineers have redesigned an integral part of renal therapy with a new transfer set prototype.

***Utilizing Bioreactors to Remove Dissolved Nutrients in Wastewater***

Presented By: Amelia Bergbower Gomez, Marie-Pia; Johnson, Jack; Sukanen, Sarah; Walker, & Mary Grace (Gracie)

Supported By: Dr. Jason Streeter, Dr. Tom Johnston, Dr. Gajan Sivandran, Engineering

An abundance of nutrients wastewater, including nitrogen and phosphorus, has led to algae covering the walls and floors of three pools within one water treatment system for the sponsor. Although algae growth within water systems poses no severe health risk, the amount of growth

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(up to 10,000 square feet) is an aesthetic issue. The goal is to design and implement a bioreactor to remove the dissolved nutrients attributed to algae growth in the water. After researching different types of biological filters, the solution that fits within constraints best is an attached growth biological filter with plastic media.

♦ Mundelein 603♦

***Vector Dark Matter: Dark Photon Scattering with Standard Model Fermions***

Presented By: Zachary Long

Supported By: Dr. Walter Tangarife, Department of Physics

Dark photons are a theorized particle to explain dark matter force mediation like how a photon interacts with visible matter. However, a dark photon has mass. Computing the cross section or the probability of interacting with this process involves utilizing modified quantum electrodynamics (theory explaining the electromagnetic force on the quantum scale at high energies). The cross section is an essential quantity that can be used to calculate the relic abundance (a measure of the amount of a particle left over from the big bang) which can be used in the potential detection of dark matter.

♦ Mundelein 605 ♦

***Optimized Separation of Terpenes and Terpenoids found in Cannabis Products via GC-EI-MS***

Presented By: Kristina Martinet; Mulcahy Scholars Program

Supported By: Dr. James DeFrancesco, Senior Lecturer, Interdisciplinary Forensic Science Program

The cannabis plant (*Cannabis Sativa* L.) produces a variety of terpenes and terpenoids that are responsible for the aroma characteristics and provide a variety of medical benefits. We have developed an optimized method for separation and identification of these compounds via Gas Chromatography-Electron Impact-Mass Spectrometry (GC-EI-MS). Due to the wide boiling point range of these compounds, commercial laboratories perform the analysis using liquid injection. However, separation of the numerous and wide variety of compounds required for high throughput analysis is challenging. We have determined that separation of terpenes and terpenoids was improved by modifying several key GC column parameters.

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♦ **Mundelein 605** ♦

***The Art of Museum Studies***

Presented By: Brianda Gonzalez

Supported By: Lissette Amón, ACE Advisor; Dr. Catherine Nichols, Senior Lecturer in Cultural Anthropology and Museum Studies Director, May Weber Ethnographic Study Collection

A brief description of what one does in the collection and the kinds of hiccups that can occur in the museum world, as well as the importance of where an object truly comes from.

***Water, Women, and Children: A Study of Water Insecurity, Conservation, Gender-Based Violence in Indonesia***

Presented By: Andi Beaudouin

Supported By: Dr. Paula Skye Tallman, Department of Anthropology at Loyola University Chicago Dr. Stroma Cole, Department of Geography and Environmental Management at University of Westminster; Martha Hebi, Project Multatuli; Dr. Binahayati Rusyidi, Department of Social Welfare, at Universitas Padjajaran.

Residents of Indonesia disproportionately suffer from health disparities arising from a lack of accessible, clean water. People across the world use water everyday for drinking, cooking, and cleaning. Without clean access to water, there can be dire and catastrophic physiological consequences. We aim to deeper explore the relationship between usable water accessibility and health through extensive research and module creation curated for Indonesian teens and young adults to improve their quality of health and ecological well-being.

♦ **Mundelein 607** ♦

***ASPIRE Scholarship: Spring 2023 Internship with Congresswoman Jan Schakowsky's District Office***

Presented By: Clarissa Steinbrecher

Clarissa Steinbrecher was awarded the ASPIRE Scholarship for her unpaid academic internship in the spring of 2023. Clarissa will present her experience with Congresswoman Jan Schakowsky's Chicago and Skokie District Office, and discuss her role as a casework intern.



***Fast Fashion in the Age of Global Capitalism***

Presented By: Samantha Bahena

Supported By: Dr. Minwoo Jung, Assistant Professor, Department of Sociology; Kajal Patel, M.A., Department of Sociology

Since the 1980s, the U.S. garment industry has outsourced clothing manufacturing to the global South. Manufacturing is primarily outsourced to the global South because of its weak labor laws and low minimum wage requirements. As a result, customers of U.S. clothing corporations are able to purchase clothes at low costs, but workers in the garment industry in the global South become increasingly impoverished. The influence of celebrities and social media in recent years has encouraged the overconsumption and rapid disposal of clothing, widening the lifestyle gap between consumers in the global North and manufacturers in the global South.

***Landlords and the Racial Landscape of Chicago Evictions***

Presented By: Jonathan Nerenberg; CAS Summer Research Fellowship

Supported By: Dr. Peter Rosenblatt, Associate Professor, Chair, Department of Sociology

In the United States, evictions are disproportionately filed against black renters and in black neighborhoods. Part of this is due to prejudices held by landlords. Yet quantitative studies of eviction face a difficulty accounting for the role of landlords because of how data for such studies is generated. We address this issue using a unique dataset linking all properties owned by a landlord to those where they have filed an eviction. This allows us to measure eviction rates within landlord property portfolios and explore how neighborhood-level rates of eviction differ for properties held by the same landlord.

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# Research and Engagement Poster Presentations:

## Session 2

2:00 PM - 3:30 PM

### ◆ Poster 1 ◆

#### *Characterizing the Enzymatic Activity and Thermostability of Protein B-Glucosidase B (BglB) Mutant Y118F*

Presented By: Sofia Ponce, Kayla Gordon

Supported By: Dr. Emma Feeney, Department of Biology

The purpose of this experiment was to characterize the functionality of BglB mutants and generate datasets to train artificial intelligence algorithms to predict mutant functionality. It was hypothesized that mutant Y118F would demonstrate decreased catalytic efficiency and thermostability compared to WT based on the predictive capacities of Foldit, a predictive modeling software. Foldit predicted decreased local interactions such as hydrogen bonds for mutant Y118F, suggesting decreased stability. Experimentation was performed to analyze the enzymatic activity and thermostability of mutant Y118F.

### ◆ Poster 2 ◆

#### *May Weber Ethnographic Study Collection: Museum Studies/Collections Management Intern*

Presented By: Hannah Sween

Supported By: Dr. Catherine Nichols, Department of Anthropology

The responsibilities of May Weber Collection interns include the physical care and management of cultural objects and documents, handling techniques, cataloging procedures, and records digitization. Interns engage with a variety of topics related to anthropology and the care and use of cultural materials including the development of collections, their purpose, and their ethical management.

### ◆ Poster 3 ◆

#### *Got Mylks?*

Presented By: Nicole Papanton, Lucia Macoretta, Drew Evans, Neil Beran

Supported By: Dr. Anne Reilly, Department of Management

This multidisciplinary study examines the liquid dairy and alternative milk markets through 4 different lenses, exploring the intersection of consumer sentiment, industry financial performance, nutritional science, and environmental implication using metrics compiled from

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industry financial and market research, consumer sentiment surveys, and empirical scientific research. Through our analysis we realized that our results were rife with contradictions. Consumers often pick non-dairy alternatives for health or environmental reasons, but this choice is often rooted in misinformation. Additionally, it is broadly perceived that alternative milks are the largest challenger to the dairy milk industry. However, the industry has been challenged since before alternative milks gained significant share.

◆ Poster 4 ◆

***Modeling Causality Between CHD and Newly-Classified Gut Microbiome Traits in African Ancestry Populations***

Presented By: Jacob Grandinetti; Mulcahy Scholars Program

Supported By: Dr. Heather Wheeler, Department of Biology

Since the inception of Genome Wide Association Studies (GWAS), African populations have been sorely underrepresented in genomic sequencing in lieu of European populations, which historically have had greater access to DNA sequencing. Recent studies have shown that the composition of the gut microbiota is closely linked with coronary heart disease (CHD) risk, and our current point of interest in analyzing these studies is using Mendelian randomization to test for causality between each study, specifically in African populations.

◆ Poster 5 ◆

***Investigating the Biological Function of TrxL-1 in Plasmodium Berghei***

Presented By: Keeley Carney; Mulcahy Scholars Program

Supported By: Dr. Stefan Kanzok, Bioinformatics

As Plasmodium transitions between humans and mosquitoes, it reorganizes its cytoskeleton between developmental stages. Here we present the novel Plasmodium thioredoxin-like protein 1 (TrxL-1). We hypothesize that TrxL-1 plays a role in subpellicular microtubule organization during ookinete stage development. To further study the role of TrxL-1, we aim to produce TrxL-1 specific antibodies for immunofluorescence assay. To this end we present here the cloning, expression, and purification of recombinant TrxL-1 of Plasmodium berghei. After transforming a vector containing the TrxL-1 gene into M15 protein expression cells, we performed protein purification using affinity chromatography under urea-dependent denaturing conditions.

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◆ Poster 6 ◆

***The Effects of Oxaliplatin, 5-Fluorouracil, Capecitabine, Cyclophosphamide, and Cisplatin on the Gut Microbiome***

Presented By: Anjali Devabhaktuni; Biology Summer Research Fellowship; Mulcahy Scholars Program

Supported By: Dr. Michael Burns, Department of Biology

The proposed study intends on better understanding the bacterial microbiome and its interaction with the drugs- Oxaliplatin, 5-Fluorouracil, Capecitabine, Cyclophosphamide, and Cisplatin -and host. I expect to see a decrease in the variety of the microbiota, in comparison to the microbiome with no treatment, after the drug treatments are administered on the microbial communities. Furthermore, I expect to see that the addition of probiotics to the microbial communities after treatment can aid in restoring the variety of the bacteria that are present. Through a two-step approach, the microbiome can be observed to be altered, a plausible way to protect the patient's microbiome.

◆ Poster 7 ◆

***Maternal Effects on Growth***

Presented By: Leila Ikeda; Mulcahy Scholars Program

Supported By: Dr. James Cheverud, Department of Biology; Dr. Fernando Cipriano Andrade Oliveira, Department of Biology

Maternal effects generally remain associated with the overall maternal phenotype, the connection between direct genes of the offspring and the maternal environment provided for the offspring, shaping offspring's phenotypic trait development. However, it is important to consider the indirect genetic effects (IGEs) on offspring largely attributed to the maternal genotype, persisting as the causal influence of the quality maternal environment provided for growing offspring on the conspecific offspring individual's phenotype. In this experiment, basic statistics, genetic mapping, interpretation of maps, and genomic imprinting analysis were performed alongside bioinformatic work toward assessing this genetic architecture of growth in a mouse model.

◆ Poster 8 ◆

***Examining the Role of Mutant ribbon on Gonad Development***

Presented By: Ashwini Modi; Mulcahy Scholars Program

Supported By: Dr. Jennifer Mierisch, Department of Biology

Ribbon has been known to play an essential role in the formation of organs, such as the gonad. Recent studies have presented the idea that the presence of excessive Ribbon can inhibit proper development of the gonad within *Drosophila melanogaster*. However, there is still a lack of

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understanding of how mutant ribbon affects gonad development. Initially, my project began with performing clonal analysis to produce clones that are mutant for ribbon and to identify the effect of the mutation on follicle cells and ovary development. Recently, we turned to utilizing CRISPR constructs to better see the impact of the mutation.

◆ **Poster 9** ◆

***Developmental Constraints of Toe Length on Scale Count***

Presented By: Xavier Rosas

Supported By: Dr. Thomas Sanger, Department of Biology

Previous research has shown that Anolis lizards have their own set of developmental patterns to control the development of their adhesive toe pads. To see how much further this goes we are studying the morphology of scale count and toe length in anoles and in lizard species without adhesive toe pads. We expect that the length will control for scale count in nonadhesive toe pads, but in anoles adhesive toepads this will not be found. This will continue to set forth that adhesive toe pads follow their own developmental constraints when compared to non adhesive toepad lizards.

◆ **Poster 10** ◆

***The Luciferase Project***

Presented By: Natalie Shamon; Provost Fellowship; CURA Scholars Program

Supported By: Dr. Daniel Cavanaugh, Department of Biology

Circadian rhythm is a 24 hour process that provides important advantages for organisms to adapt behavior to changing environmental conditions. *Drosophila* have been an important model organism for identifying novel circadian regulators. There have been efforts made to monitor clock gene expression in flies. Our lab developed novel lines of flies that allow for specific, inducible expression of a luciferase reporter construct for clock gene transcriptional activity. This allows us to focus on utilizing them for the purposes of disrupting the clock genes in the brain of *Drosophila*, and monitor their effect on the clock cells in their fat body.

◆ **Poster 11** ◆

***Polyomavirus BK and its Prevalence within the Urinary Tract***

Presented By: Jacquelyn Spates; Mulcahy Scholars Program

Supported By: Rita Mormando, Catherine Putonti, Department of Biology / Bioinformatics Program

Polyomaviruses are the smallest known double-stranded DNA viruses and are abundant in the human microbiota (the community of bacteria and viruses in the human body). The

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polyomavirus BK virus (BKV) is a common virus of the human urinary tract that exclusively infects human cells and is believed to be a benign member of the urinary microbiota. In previous studies, BKV is thought to occur via a respiratory route, based on the evidence of high seroconversion rates in the population by mid-childhood, with 65-90% of humans becoming seropositive by the age of ten and the presence of viral DNA in tonsillar tissue. After primary infection, BKV disseminates to the urinary tract, where it is believed to persist for the individual's life. The reason it persists within the human urinary tract remains an open question. Prior investigations of the urinary microbiota have identified associations between bacterial species of this community and urinary tract symptoms. Therefore, it is reasonable to imagine that viruses within the urinary microbiota may play a role in urinary tract symptoms and/or health. To assess the prevalence of BKV in the urinary tract, I retrieved 217 metagenome and virome data sets from publicly available sources. I then mapped the metagenomic reads to the complete BKV genome. 37.8% of the tested population had strong evidence of BKV in the sample. These findings are substantially lower than the 65-90% seropositivity rate reported in the literature, suggesting that active BK infection is much less prevalent than initially thought.

◆ Poster 12 ◆

***The Genetic and Transcriptomic Contributions of Sleep and Nutrition Phenotypes in Multiple Populations***

Presented By: Kayla Bozeman; CURA Scholars

Supported By: Dr. Heather Wheeler, Department of Biology

Due to most chronic diseases being polygenic, modern geneticists are using Genome-Wide Association Studies to predict disease susceptibility. Previous studies emphasize that 80% of the genetic data is derived from white European ancestry leading to the lack of ethnic diversity and frequent medical disparities in underrepresented groups. The purpose of our experiment is to articulate the correlation of chronotypes and nutrition phenotypes through genetic and transcriptomic contributions within multiple populations using PrediXcan.

◆ Poster 13 ◆

***A Role for SIFa Receptor in the Regulation of Drosophila Circadian Feeding Rhythms***

Presented By: Andi Beaudouin; Mulcahy Scholars Program; Provost Fellowship

Supported By: Dr. Cavanaugh

Circadian rhythms are approximately 24-hour cycles that occur in many essential biological processes, including feeding, body temperature, sleep, and hormone release. These are driven by an internal clock system that allows animals to coordinate behavioral and physiological processes with each other and to synchronize these processes to external environmental cycles. In the brain of *Drosophila melanogaster*, ~150 circadian clock neurons generate behavioral rhythms. Molecular clocks in clock neurons are synchronized to external environmental signals

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such as light through input pathways. In turn, output pathways receive and translate circadian signals from clock neurons to produce biological rhythms. However, there exists a gap in knowledge as to how neuronal pathways within the internal clock system control clock outputs. We recently identified the pars intercerebralis (PI) as an important circadian output center in flies, and furthermore showed that a subset of PI cells that express the neuropeptide SIFamide (SIFa) contributes to circadian rhythms of feeding. Here, we demonstrate a role for SIFa Receptor (SIFaR) in generating feeding rhythms. We find that constitutive loss of SIFaR results in developmental lethality. To circumvent this, we developed a conditional strategy that allows for adult-specific RNAi-mediate knockdown of SIFaR, and found that this produces a progressive degradation of circadian feeding rhythms. In future experiments we will use cell-selective RNAi knockdown to identify specific populations of neurons in which SIFaR must be expressed for flies to exhibit normal feeding rhythms. These studies will further delineate the circadian output pathways through which the circadian system modulates feeding behavior.

◆ Poster 14 ◆

***The Effects of a T352A Mutation in the BglB Protein's Catalytic Efficiency and Thermal Stability***

Presented By: Autumn Dushack, Carli Deegan

Supported By: Dr. Emma Feeney, Department of Biology

The purpose of our project is to submit data on the T352A B-glucosidase (BglB) mutation to a national database on mutation functions to help generate an algorithm for predicting protein functions based on amino acid sequences. We hypothesize that BglB mutants T352A will demonstrate decreased catalytic efficiency and decreased thermal stability in comparison to the wild-type because its overall Foldit score suggests a high likelihood of expression due to decreased polar interaction on exposed amino acids, but unchanged hydrogen bonding. We acquired this data through the use of enzyme kinetics, thermostability, and western blotting.

◆ Poster 15 ◆

***Assessing the Functional and Structural Consequences of H178W Mutation in Î²-Glucosidase (BglB) Protein***

Presented By: Jenelle Janiga, Nicole Munoz

Supported By: Dr. Emma Feeney, Department of Biology

The experiment aims to create a dataset that will be added to a database to predict protein function based on primary protein structure. We hypothesize that Î²-glucosidase (BglB) mutant H178W will demonstrate decreased catalytic efficiency and thermostability compared to the wild-type BglB protein. Intermolecular modeling analysis indicates increased atom clashing between the mutated side-chain and substrate. Published data on similar mutations H178A and H119A showed decreased thermostability of the protein, thus supporting the hypothesis. The

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data was acquired using enzymatic kinetics and thermostability assays, along with western blotting.

◆ Poster 16 ◆

***Î<sup>2</sup>-glucosidase Mutation T352V Catalytic Efficiency and Thermal Stability***

Presented By: Virginia Lignos, Khizra Ashar

Supported By: Dr. Emma Feeney, Department of Biology; Ashely Vater, the Siegel Lab at UC Davis, National Science Foundation

This study aimed to produce data to improve protein modeling software for Î<sup>2</sup>glucosidase (BglB), a crucial enzyme in producing glucose from cellulose. It was hypothesized that BglB mutant T352V would demonstrate decreased catalytic efficiency and thermal stability compared to the wild type. The T352V mutation was first observed using Foldit Standalone modeling software. DNA sequencing and SDS-PAGE analysis confirmed mutation expression and purity. The kinetic assay indicated a decrease in catalytic efficiency in the T352V mutant. The thermostability assay showed no activity for the T352V mutant, suggesting an error occurred or the temperature range was too high.

◆ Poster 17 ◆

***Determining the Enzymatic Efficiency and Thermodynamic Stability of BglB-H223A***

Presented By: Thy Le, Nicole Dowd

Supported By: Dr. Emma Feeney, Department of Biology

Our purpose is to characterize BglB-H223A to provide enzymatic efficiency and thermodynamic stability data for future protein functional modeling software. We hypothesize that BglB-H223A will demonstrate decreased catalytic efficiency and/or thermal stability compared to the wild type because its overall Foldit score suggests an unlikely expression. Intermolecular modeling analysis (local score) also indicates decreased Hydrogen bond interaction. We used thermodynamic stability assays and kinematic assays to test this hypothesis.

◆ Poster 18 ◆

***Herbicide Treatment of Invasive Elodea Canadensis in Alaska: Impacts on Macrophyte-Associated Aquatic Insects***

Presented By: Julia Hillman

Supported By: Dr. Martin Berg, Department of Biology

The herbicide fluridone has been used to treat Elodea canadensis, an invasive aquatic macrophyte on the Copper River Delta of southcentral Alaska. It is not known, however, whether the herbicide directly or indirectly impacts aquatic insects, a major food resource for young



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salmon. Two ponds, herbicide-treated and an untreated control, were sampled monthly during the summer of 2021 to assess the effects of the fluridone treatment on native and invasive vegetation and aquatic insect communities. More than 15,000 insects were collected representing 8 orders and 22 families.

◆ Poster 19 ◆

***Investigation of the Function of the First Epineural Intermuscular Bone and the First Anal-Fin Radial Bone in Polymixia Loweii***

Presented By: Jesus Leal

Supported By: Dr. Terry Grande, Department of Biology, Dr. Wilson

Beardfishes, members of the genus *Polymixia*, are seen as living fossils as they are the sole survivors of a Late Cretaceous marine fish radiation. In this genus, the first epineural bone differs from the rest by lying in the horizontal septum and by being distinctly larger. In addition, the first anal-fin radial bone is distinctively enlarged. To investigate the function of these unique characteristics of *Polymixia*, we cleared and stained two specimens of *P. lowei* to reveal cartilage, bone, and crucially, nerves. In doing so, we hypothesize that the function of these structures is related to sound production involving the swim bladder, and that the nerves will reveal important clues to their functions.

◆ Poster 20 ◆

***Investigating the Potential Binding of Phosducin-like Protein 3 (PhLP3) to Microtubules in a Cell Culture System***

Presented By: Arden Luers; Biology Summer Research Fellowship; Mulcahy Scholars Program

Supported By: Dr. Stefan Kanzok, Department of Biology, Manny Widuch, Department of Biology

Phosducin-like protein 3, or PhLP3, is a thioredoxin-domain containing protein that is highly conserved among eukaryotic organisms. This suggests that PhLP3 performs a conserved function in eukaryotes, but that function remains unknown. We hypothesize PhLP3 to be involved in microtubule organization. We have successfully cloned human and *Drosophila* PhLP3, and are in the process of generating expression plasmids that will add a myc-tag to the protein. We will transfect the plasmids into human cell lines, and use confocal microscopy with anti-myc and anti-tubulin antibodies to investigate the subcellular localization of PhLP3, specifically whether it co-localizes with microtubules.

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◆ Poster 21 ◆

***Determining Homing Abilities of Nesting Male Threespine Stickleback***

Presented By: Marielle Martin

Supported By: Dr. Yoel Stuart, Department of Biology

Homing is a behavior demonstrated by the threespine stickleback that allows them to return to their home site when displaced. This behavior is especially visible in nesting male stickleback, as the male stickleback have the role of guarding their nests which gives them incentive to home. In this experiment we displaced nesting male stickleback over a variety of distances in order to see how the distance displaced impacts homing ability. Stickleback were marked and released, and their return was monitored by a combination of GoPro and diver observation.

◆ Poster 22 ◆

***Interactions Displayed by Burkholderia Cenocepacia Morphotypes When Grown in Mixed Cultures***

Presented By: Milan Patel

Supported By: Dr. Caroline Turner, Department of Biology

Burkholderia cenocepacia is an opportunistic pathogen that commonly forms biofilms in the lungs of cystic fibrosis patients. The bacteria's unique morphotypes, including studded, ruffed spreader, and wrinkly, have been shown to differ in fitness, biofilm production, and other characteristics. However, it is unclear how these different strains interact in mixed cultures. In this study, we aim to assess the interactions between morphologically different B. cenocepacia strains in mixed cultures and determine if they may exhibit a synergistic or antagonistic relationship. Our results may shed light on the interactions that underlying B. cenocepacia morphotypes display when grown in mixed culture.

◆ Poster 23 ◆

***Testing The Genetic Basis of Dorsal Spine Development in Threespine Stickleback***

Presented By: Sidney Ryan; Mulcahy Scholars Program; Provost Fellowship

Supported By: Dr. Yoel Stuart, Department of Biology

In the threespine stickleback fish, *Gasterosteus aculeatus*, the gene MASER contains allelic variants that result in either "Long" or "Short" dorsal spines. We use this morphological signature of underlying genetics to infer the genetic basis of variation in a fossil stickleback sequence of *Gasterosteus doryssus*, and for modern *G. aculeatus* populations that have not been genotyped at MASER. If MASER is influencing spine lengths in our sample populations, then we should recover bimodality in spine lengths. Our analysis did not consistently support this hypothesis, suggesting that MASER does not always produce Long and Short variations in a given population.

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◆ Poster 24 ◆

***Non-Target Effects of the Herbicide Fluridone on Aquatic Invertebrates on the Copper River Delta, Alaska***

Presented By: Brooklyn Spades

Supported By: Dr. Martin Berg, Department of Biology

An invasive aquatic macrophyte, *Elodea canadensis*, has been spreading on the Copper River Delta (CRD) in southcentral Alaska since 1982. The herbicide fluridone is effective at reducing *Elodea* populations, however the non-target effects of the herbicide on aquatic invertebrates, a major food resource for salmon, are unknown. I examined macroinvertebrate communities in two CRD ponds, one treated with fluridone and the other serving as an untreated control, to assess non-target effects of the herbicide. I found that invertebrate communities in the two ponds were not significantly different suggesting no indirect effects of the herbicide on salmon food resources.

◆ Poster 25 ◆

***Antibiotic Microbial Evolution: Exposing Nutrient-Limited Escherichia Coli Strains to Ampicillin***

Presented By: Esabella Yon

Supported By: Dr. Caroline Turner, Department of Biology

In our AME experiment, two nutrient-limited environments were utilized: carbon-limiting and nitrogen-limiting. After completing 25 days of exposing the limited strains to constant and ramping concentrations of Ampicillin, the most notable period of evolution occurred during the first eight days, in which many populations went extinct. This experiment aims to repeat the first eight days to gain better insight into what occurred and to understand if certain mutations uphold across distinct and changing environments, as well as observe if the fitness of the bacteria changes.

◆ Poster 26 ◆

***Identifying Ribbon's Transcriptional Targets in Adult Drosophila Testes***

Presented By: Madeline Hakala; Mulcahy Scholars Program; Provost Fellowship

Supported By: Dr. Jennifer Mierisch, Department of Biology

The ribbon (*rib*) gene plays an essential role in *Drosophila* testes development, but its transcriptional targets are currently unknown. This study seeks to identify *Rib*'s targets by overexpressing *rib* in adult *Drosophila* testes and analyzing the RNA transcripts. Utilizing the Kallisto-Sleuth pipeline, gene expression levels of *rib* overexpression flies were compared to the control. The resulting differentially-expressed genes were compared to other available data to

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filter results. Additionally, DE genes underwent gene ontology analysis. Ultimately, 301 potential gene targets were identified. Immunohistochemistry and qRT-PCR experiments are currently being conducted to validate select genes of interest as targets of Rib.

◆ **Poster 27** ◆

***Central Clock Control of Drosophila Feeding Rhythms***

Presented By: Lilly Pireva, Ruth Meier; Mulcahy Scholars Program

Supported By: Dr Daniel Cavanaugh, Department of Biology, Dr Sumit Saurabh, Department of Biology

This project is interested in determining which central clock neurons in the Drosophila brain require functional molecular clock components for proper feeding:fasting and rest:activity rhythms. The gene editing approaches we use include CRISPR/Cas9, GAL4-UAS, and neuronal silencing. We use the Drosophila Activity Monitor (DAM) system to record rest:activity data, and the Fly-Liquid Interaction Counter (FLIC) system to record feeding:fasting data.

◆ **Poster 28** ◆

***Determine How Downstream of Gene(DoG) Production Changes Gene Expression in Aging***

Presented By: Prachi Patel

Supported By: Dr. Hariklia Dimitropoulos, Dr. Shannon Lauberth

Age is a significant risk factor for cancer, affecting both the disease in general and many specific types of cancer. While changes in gene expression and the protein coding transcriptome associated with aging have been well characterized, the non-coding portion of the human genome has received less attention. Recent studies have identified a novel type of long non-coding RNA called Downstream-of-Gene (DoG)-RNAs that originate from the promoter of producing genes and extend beyond the mRNA 3' end processing polyadenylation signals. While DoGs have been linked to cellular stress response and some human diseases, their association with aging and tumor progression remains largely unexplored. In this study, we aim to investigate the possible relationship between the expression of specific DoG RNAs and aging. Furthermore, we will explore the potential involvement of these DoG RNAs in tumor progression and malignancy. Our study will provide new insights into the non-coding portion of the human genome and its role in aging and cancer.

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◆ Poster 29 ◆

***Determining if A80S Mutation in Beta-Glucosidase B (BglB) Enzyme Changes Catalytic Efficiency and Thermal Stability Compared to Wild-Type***

Presented By: Greg Deeb, Vlade Nikolovski

Supported By: Dr. Emma Feeney, Department of Biology

The purpose of this project is to characterize the function of the A80S mutant of Beta-Glucosidase B compared to the wild-type enzyme. We hypothesize that this mutant will demonstrate decreased catalytic efficiency and thermal stability relative to the wild-type because its increase in Foldit energy score suggests a decreased likelihood of expression, and intermolecular modeling analysis also points to decreased local hydrogen bonding. We tested this by using thermostability and kinetic assays to determine the function of the enzyme. SDS-PAGE and Western blot were used to determine efficiency of enzyme purification.

◆ Poster 30 ◆

***"Carry-Over" Effects After Magnetic Stimulation - A Mechanistic Study***

Presented By: Maria Dima

Supported By: Dr. Hui Ye, Department of Biology, Vincent Hall, Jenna Hendee

Magnetic stimulation is widely used for clinical neuromodulation, such as transcranial magnetic stimulation and peripheral nerve stimulation. Normally, neurons are expected to resume pre-stimulation states and functions immediately after the magnetic stimulation. However, the effects of magnetic stimulation still last after the termination of the magnetic stimulation (named "carry-over effects") and could generate profound outcomes in clinical magnetic stimulation. Using experimental and modeling methods, we investigate cellular and molecular mechanisms of carry-over effects during magnetic stimulation. Delineating these mechanisms is essential for the further development of the magnetic stimulation technology for quick, reversible neuromodulation.

◆ Poster 31 ◆

***Small Business Struggles***

Presented By: Huy Du

The Small Business Development Center Internship provides an opportunity to gain valuable experience in the field of small business development. As an intern, I will be responsible for providing assistance to small business owners in the areas of business planning, marketing, financial management, and operations. I will also be responsible for researching and analyzing data to identify trends and opportunities for small business growth. Additionally, I will be

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responsible for developing and delivering presentations to small business owners on topics related to small business development.

◆ Poster 32 ◆

***Design and Synthesis of Na<sup>+</sup>-NQR Inhibitors as New Antibiotics***

Presented By: Amina Dalal; Mulcahy Scholars Program

Supported By: Dr. Becker, Professor of Chemistry and Biochemistry, Zachary Liveris, Department of Chemistry and Biochemistry

An effective drug is one that disrupts the viability of bacteria and prevents unwanted repercussions to host cells. The membrane-bound protein Na<sup>+</sup>-dependent NADH:Ubiquinone oxidoreductase, also known as Na<sup>+</sup>-NQR, presents ideal conditions for a drug target. Inhibiting this protein would interrupt its normal functions including electron transport from NADH to ubiquinone and the pumping of sodium ions. This impairment would negatively affect ATP synthesis, efflux pumping, and more, degrading the health of bacterial cells and allowing an immune response from the host. Our team is working to develop an effective inhibitor using derivatives of a quinolone scaffold.

◆ Poster 33 ◆

***Bisoxazoline Ligand-Supported Ring-Closing Carbonyl-Olefin Metathesis***

Presented By: Allison Gatz; Mulcahy Scholars Program

Supported By: Dr. James Devery, Department of Chemistry

Ring-closing carbonyl-olefin metathesis (COM) is an effective tool in synthesizing carbon-carbon bonds. The metathesis reaction employs a Lewis acid catalyst to react a carbonyl and a pendant olefin, yielding a cyclic alkene product and a carbonyl byproduct. This process results in a highly-ligated catalyst-byproduct species forming due to the catalyst's inability to differentiate between the starting reagent and byproduct carbonyls. Because this catalyst interaction likely terminates the COM reaction, we turn to alternative reaction methods to prevent byproduct inhibition. Using additives, such as bisoxazoline ligands, can prevent catalyst byproduct inhibition through creating a secondary cycle in the COM system.

◆ Poster 34 ◆

***Chromatic Adaptation in the Red Algae *Galdieria Sulphuraria****

Presented By: Vidya Gundlapalli, Evan Smolen

Supported By: Dr. Colin Gates, Department of Chemistry and Biochemistry

*Galdieria sulphuraria* is an extremophilic red alga that has a wide range of pigments for light absorption. To study its chromatic adaptation and establish if this process in red algae resembles

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that in cyanobacteria, we placed liquid and plate cultures under red and blue light in brightly lit, 30°C environments. This was done to measure growth and optical density of the algae under these different wavelengths of light. By completing these experiments and then analyzing data collected via spectrophotometry and imaging, we will be able to further the study of light absorption and characteristics of *Galdieria sulphuraria*.

◆ Poster 35 ◆

***Evaluation of DapE Bacterial Enzyme Inhibitors Utilizing a Thermal Shift Analysis Toward the Discovery of Potential Novel Antibiotics***

Presented By: Katherine Konczak; Carbon Undergraduate Research Fellowship Program

Supported By: Dr. Daniel Becker, Department of Chemistry and Biochemistry; Dr. Ken Olsen, Department of Chemistry and Biochemistry; Emma Kelley, Department of Chemistry and Biochemistry; Dr. Boguslaw Nocek; Dr. Sergii Pshenychnyi; Dr. Andrzej Joachimiak; Dr. Karla J. F. Satchell; Dr. George Minasov; Dr. Nicole Lynn Inniss

The rapid emergence and spread of antibiotic resistant bacteria underscore the need for research and discovery of antibiotics with a new mechanism of action. A promising antimicrobial target in all Gram-negative and most Gram-positive bacteria is the dapE-encoded N-succinyl-L,L-diaminopimelic acid desuccinylase enzyme (DapE). We identified several hit molecules through high-throughput screening (HiTS). In-silico docking simulations were conducted using the computational suite Molecular Operating Environment (MOE) to determine promising analogs of the hit chemical classes. The inhibitory potency of lead molecules synthesized by our research group was obtained using our previously reported ninhydrin-based assay. The thermal stability of the most potent analogs against DapE was determined by a thermal shift assay (TSA). We present T<sub>m</sub> data for several representative inhibitors of HiDapE and AbDapE.

◆ Poster 36 ◆

***Molecular Dynamics of Effector Binding Sites of Potato ADP Pyrophosphorylase***

Presented By: Prachi Patel; Mulcahy Scholars Program; Provost Fellowship

Supported By: Dr. Ken Olsen, Department of Biology

ADP-glucose pyrophosphorylase is a key enzyme for bacterial glycogen and plant starch synthesis as it controls carbon flux through this pathway via its allosteric regulation. ADP-glucose pyrophosphorylase is a regulatory, homotetrameric enzyme that catalyzes the reaction between adenosine triphosphate and glucose 1-phosphate, producing ADP glucose and pyrophosphate. By synthesizing ADP-Glucose, this enzyme commits those carbon atoms to the production of glycogen and starch, important energy storage molecules in bacteria and plants, respectively<sup>1</sup>. Plant ADP-Glc PPase is activated by binding 3-phosphoglycerate (3PGA). The project's end goal is to determine how 3PGA acts as an allostatic effector.

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◆ Poster 37 ◆

***Internship with Criminal Defense Attorney***

Presented By: Nicole Pysz

Supported By: Nichole Massarello, Attorney at Law

What is it like to work alongside a prominent criminal defense attorney in Chicago? This presentation covers the intricacies of a legal internship experience in the heart of Chicago's downtown area. Themes include: clientele, case types, justice, and interaction with law enforcement and the court system.

◆ Poster 38 ◆

***City of Chicago Department of Planning & Development Internship***

Presented By: Yesenia Rivera

A reflection of my time as a public service intern for the city of Chicago in the Department of Planning and Development. As a public service intern, I support communications and outreach for We Will Chicago, the first citywide planning initiative in over 50 years. Duties I have as an intern are to conduct research, assist in social media marketing planning, support community outreach and programming, support coordination between the City and its consultants, attend and support in-person events.

◆ Poster 39 ◆

***The Effect of Hospital Mergers on Profits: A Multi-Acquisition Study***

Presented By: Ryan Love

Supported By: Dr. Timothy Classen, Department of Economics

For a large sample of hospital mergers that take place between 2016 and 2022, I estimate the relationship between merger status and profitability (measured as mean profit per bed). I find statistically and economically significant evidence that hospitals that have carried out a merger in the past 6 years have decreased mean profit per bed between 15% and 27% on average. I also find evidence that case mix index is a strong indicator of hospital profitability, with a one-unit increase in CMI leading on average to a 68% to 114% increase in mean profit per bed.



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◆ Poster 40 ◆

***Tube-Based Pumping of a Viscous Liquid***

Presented By: Gabriel Gallegos, Deja Scott, Nuala Kalensky

Supported By: Dr. Tom Johnson, Department of Engineering Dr. Atif Yardimci, AbbVie

The Capstone Design Project aims to create a tube-based pump engine capable of moving a viscous liquid at a flow rate of 1 ml/hr to 20 ml/hr with an accuracy of fifty percent. The project aims to pump 100ml of Duodopa, a medication used to treat Parkinson's disease, over 16 hours without free flow. The pump engine comprises a foot-length tube connected to a portable case within the patient's vest.

◆ Poster 41 ◆

***Acoustic Monitoring of Emerald Ash Borer Larvae in Ash Tree Saplings***

Presented By: Gabriel Iorgulescu, Victor Croitoru, Becca McCue, Eric Otrusina, Cameron Arkesteyn

Supported By: Dr. Streeter, Dr. Sivandran, Chuck Cannon, Sam Panock, Chai-Shian Kua, Engineering

The aim of this project is to develop an acoustic sensor to monitor the presence and activity of Emerald Ash Borer (EAB) larvae in ash tree saplings. Specifically, this device will be used on lingering ash tree saplings, a species proven to resist damage from these insects. Currently, researchers guess when to sample the sapling, however the finished device will detect the timeframe that an EAB larva dies in a lingering ash sapling. This information allows researchers to know when to graft samples of the inner bark tissue of that sapling to reveal phenotypic information about the lingering ash sapling.

◆ Poster 42 ◆

***Examining Sustainability and Greenhouse Gas Emissions from LUC Athletics Travel***

Presented By: Cosette Ellis, Marilla Smith, Catherine Molteni, Shareef Amor, AJ Mees, Jacob McCarthy

Supported By: Megan Conway, Office of Sustainability

The U.S. Environmental Protection Agency states that 27% of U.S. greenhouse gas emissions in 2020 came from transportation. Loyola's 2025 Climate Action Plan committed to a 25% reduction in Scope 3 emissions, to which Loyola Athletics travel contributes significantly. We collected data from LUC Athletics on travel methods and conducted an audit to calculate the emissions from Athletics travel. We also researched practices used by athletics programs at other institutions to reduce travel emissions. In addition, we interviewed student athletes to understand

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their perspectives on sustainability initiatives within Athletics. Our project promotes student engagement and provides data for use in future sustainability planning in Loyola Athletics.

◆ Poster 43 ◆

***Total Carbon Accumulation on Bird Feathers in Chicago***

Presented By: Grace Whitten

Supported By: Fr. Stephen Mitten, SJ, School of Environmental Sustainability

My project aims to look at how carbon accumulation on bird feathers may differ from an area near an industrial corridor to an area not near an industrial corridor. I argue that environmental racism in Chicago can affect birds in addition to humans.

◆ Poster 44 ◆

***GirlForward Development Internship***

Presented By: Avery Robbins, Social Justice Internship

Supported By: Jorion Tucker, Center for Engaged Learning, Teaching, and Scholarship (CELTS), Rosie Tingpalpong, Ashley Marine

This past academic year, I was fortunate to serve as a development intern at GirlForward! GirlForward is a non-profit organization located here in Chicago and in Austin, TX. The mission of the organization is to enhance the opportunities of highschool age girls who identify as asylum-seeker, immigrant, or refugee once they resettle here in the U.S. This mission is achieved through education, safe spaces, and mentoring programs. As the development Intern, my work largely dealt with organizing donor databases, brainstorming innovative ways to fundraise, and working directly and indirectly with program donors to strengthen their relations with the organization.

◆ Poster 45 ◆

***GirlForward Mentoring Program***

Presented By: Angelica Luszc; Social Justice Internship

Supported By: Jorion Tucker, Center for Engaged Learning, Teaching, and Scholarship (CELTS), Alexis Armfield

The GirlForward Mentoring program pairs a high school girl with an adult woman, forming a friendship and support system. GirlForward looks to discuss and improve what they call the mentees' 4 W's: wellness, wisdom, wallet, and world. Currently, as an intern, I am working on creating a resource guide that includes information on educational, housing, and legal support. For example, I have included GirlForward's tutoring program that helps girls with their

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assignments and promotes their academic confidence and journey. I am proud to be a part of GirlForward as they serve girls who identify as refugees, immigrants, and asylum seekers.

◆ Poster 46 ◆

***Immigration and Naturalization Program at Catholic Charities***

Presented By: Abigail Alvarez; Social Justice Internship

Supported By: Jorion Tucker, Center for Engaged Learning, Teaching, and Scholarship (CELTS),

I will explain how this program provides assistance to immigrants who are currently seeking legal assistance in their immigration process. I will talk about how I assist victims of domestic violence and assault by writing and translating their personal statements. These statements are crucial to their application because they determine whether the applicant obtains legal status or not. I will also explain how I am in charge of reviewing cases and making sure that prior documentation (police reports and applications) reflects the new documentation. I work alongside very skilled lawyers, who have kindly guided me throughout the whole immigration process.

◆ Poster 47 ◆

***GirlForward Internship- Education Program***

Presented By: Eleanor Friel, Social Justice Internship

Supported By: Jorion Tucker, Center for Engaged Learning, Teaching, and Scholarship (CELTS), Amara Trivedi, Education Program Manager

As the education intern at GirlForward I am learning how the tutoring program works and preparing for GirlForward's summer camp. I've learned how to facilitate group zoom sessions, tutor girls, participate in all-staff meetings, the logistics of organizing a tutoring program and summer camp curriculum, and how to support my supervisor, coworkers, and fellow interns. This internship has greatly improved my professional teamwork and communication skills and expanded my worldview. I especially love the culture of GirlForwards' space, because it is a women-led organization where everyone is encouraged to advocate for themselves, to share their ideas, to prioritize their health, and to feel supported by the rest of the team. This is my first internship and I feel so lucky to be a part of an organization that, in my opinion, supports some of the most important and incredible people in our community: young refugee/immigrant women. I want to continue learning from my supervisor and coworkers about how to be a supportive and valuable team member, and learning from the girls about their unique perspectives as immigrant women in Chicago and how to be a good ally.

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◆ Poster 48 ◆

***The Anger Within the Grrrl; The Revolution Outside***

Presented By: Kora Elms Fleming

Supported By: Dr. Leslie Dossey, Department of History

Evergreen State College in Olympia, Washington was the breeding ground for a revolutionary, angry, feminist, Grrrl movement that would eventually spread across the country and punk pockets of the world. The Riot Grrrl movement provided a space for teenage and college age women to be angry in the early 1990s. This paper examines how anger as a tool for women is a double edged sword. On one end it is a release of emotion that demands to be taken seriously. On the other hand anger is a red X that the Riot Grrrls could not scrub off.

◆ Poster 49 ◆

***Analyzing the Changing Genres and Techniques of the Treatment of Anorexia Nervosa from 1980s-2000***

Presented By: Kanishka Singh; Mellon Scholarship

Supported By: Dr. Alice Weinreb, Department of History

Anorexia Nervosa, a type of eating disorder, was a phenomenon that rapidly overtook the medical community, and was initially considered to be an upper-class white women's disease. Our study consists of analyzing various medical school databases and medical archives to evaluate the different forms of the techniques which emerged from the 1980s-2000 to treat Anorexia Nervosa. Our analysis of the primary sources indicates no strong improvement in the treatment options for Anorexia Nervosa throughout the two decades, indicating that although we have gained a greater understanding of the eating disorder a clear form of treatment still remains to be found.

◆ Poster 50 ◆

***Fat Liberation Versus Mainstream Media Presentation of Eating Disorders***

Presented By: Priyanka Patel

Supported By: Dr. Alice Weinreb, Department of History

This project focuses on the presentation of eating disorders in mainstream media and the Fat Liberation movement in the United States from 1970-2000. As feminism began to rise and spread globally during the 1970s, this sparked conversations regarding anorexia nervosa and bulimia nervosa in communities. Medical professionals defined eating disorders as a complex culture-bound syndrome, with biopsychosocial factors influencing individuals. However, outside of the healthcare field, the methods used by mainstream media sources and Fat Liberation Activists to portray the significant impact of eating disorders differed in various ways.

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◆ Poster 51 ◆

***The Bipartisan Safer Communities Act: Implications for Mental Health Services***

Presented By: Jalpa Mehta, Nina Zheng

Supported By: Dr. Theresa Burkhart, Healthcare Administration

The Bipartisan Safer Communities Act (BSCA) was enacted on June 5th, 2022. This policy was passed due to the growing prevalence of gun violence and the lack of access to mental health services. Our analysis focuses specifically on the implications the BSCA will have on mental health services. The BSCA expands the Medicaid community-based behavioral health services and will provide funding and training. Recommendations for healthcare organizations include working with the community to promote mental health services, aligning current policies with the BSCA, and investing in children and family mental health services.

◆ Poster 52 ◆

***Chicago Obesity Rates and Food Access***

Presented By: Elliot Cleghorn, KC Galloway, Gabe Skaer, Scott Black

Supported By: Dr. Frederick Kaefer, Business-Information Systems

Are Chicagoans more subject to a higher rate of obesity if there is a lower amount of grocery stores options in their neighborhood?

◆ Poster 53 ◆

***Income Disparity Based on Gender, Race, Age, and Height***

Presented By: Gabriela Groom, Edina Hadzic, Huy Nguyen, Troy Moore

The goal of our research is to use Python to investigate the relationship between an individual's income and their various social identities such as gender, race, and age. Our focus question is- "How do different demographics, such as gender, race, and age, impact an individual's income?" We aim to generate models that will illustrate trends within each isolated social identity, as well as the trends that occur when two or more of these social identities are considered simultaneously. The data extracted from our research will create patterns that will aid audiences in thinking critically about why certain income disparities exist.

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◆ Poster 54 ◆

***Public Transportation Access and School Performance in the Chicagoland Area***

Presented By: Lena Goodelle, GT Moy, Sophie Maday, Maya Marks-Strauss

Supported By: Dr. Frederick Kaefer, Business-Information Systems

Does a lack of access to public transportation impact a child's ability to perform in formal education? Applying statistical data, we will be investigating the relationship between children's access to transportation and their performance in the education system. Referencing Grade Point Average and graduation rates across Chicagoland Public Schools, we will examine whether these metrics share a relationship with these students' ease of access to physical resources.

◆ Poster 55 ◆

***LOOP Community Engagement Market Research***

Presented By: Emma Alperovich, Julian Cisneros, Kelsey Morley, Bella Gembus, Izzy

Richardson, Loriana Mrugala, & Paige Koffman

Supported By: Dr. Stacy Neier Beran, Department of Marketing

We employed market research techniques for MARK 311 in order to successfully identify the motivating factors of community engagement through a second-hand shopping platform, LOOP. This was done through several research objectives: assessing the convenience of receiving products purchased online, investigating consumer needs, evaluating customer satisfaction regarding user experience, investigating e-commerce trends, exploring impactful digital platforms for services like LOOP, and understanding consumer needs that lead to a purchase on LOOP. Our ultimate goal of research is to provide informative insights to LOOP regarding their consumer basis.

◆ Poster 56 ◆

***How Fast Fashion Impacts LOOP***

Presented By: Alex Van de Werken, Patricia Calma, Mariana Valverde, Charlie Rubinas, Nicolas Soto Hay, Thomas Creagan, Aileen Cirilo

Supported By: Dr. Stacy Neier-Beran, Department of Marketing; Caro Bush & Elise Giles, LOOP

Our presentation will contain our Research Objective, Observations, Surveys, as well as key insights from fast fashion data while collaborating with LOOP. We found trends against fast fashion and in favor of second hand sustainable practices.

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◆ Poster 57 ◆

***Acshion***

Presented By: Joseph Johnson, Fernando Garcia De Llano Camacho, Joseph Ward, Heraldo Alvarez, Patrick Leonard, Ahern Thomas

Supported By: Dr. Stacy Neier Brian, Department of Marketing

The foundation of our group is to make a splash in the waterpark industry by making a space for both fun and learning in the STEAM fields

◆ Poster 58 ◆

***Modeling Cannibal Dark Matter***

Presented By: Alexander Lewis

Supported By: Dr. Walter Tangarife, Department of Physics; Dr. Brian Cannon, Department of Physics

Dark matter (DM) has played a certain but invisible role in the development of the universe. Its obscure nature prompts many theoreticians to develop models of DM. We here explore the "cannibal" model of DM, characterized by a thermally decoupled dark sector, a mass gap, and a period during which a 3-2 interaction dominates the sector. That period is known as the cannibalistic phase as the rest mass of the DM particles are converted to reheat the dark sector, i.e. the particles consume each other to keep warm.

◆ Poster 59 ◆

***Studying the origin of Terrestrial Gamma-ray Flashes at the Telescope Array Detector***

Presented By: Davide Mazzucco, Tyler Knight

Supported By: Dr Rasha Abbasi, Department of Physics; Dr Ny Kieu, Department of Physics

Terrestrial gamma ray flashes (TGF) are emissions of gamma rays in the earth's atmosphere during thunderstorms and this project aims to understand more about their initiation and propagation. The TGF's are observed by the Telescope Array Surface Detector (TASD) in conjunction with a high-speed camera placed at the site that records each lightning event. We can then use these lighting images to study the spectra of lightning return stroke, this in turn helps determine specific characteristics of each return stroke like temperature and electron density. This can be compared with similar measurements from lighting events not associated with TGF's to help understand TGF initiation and propagation.

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◆ Poster 60 ◆

***Conformations of CAG Three-Way Junctions***

Presented By: Benjamin Ward, Sarah Nicole Murczek

Supported By: Dr. Brian Cannon, Department of Physics

Numerous genetic diseases arise from repetitive DNA sequences, such as CAG, that induce non-helical structures, which interfere with normal DNA processing and promote the disease state. Here, using a combination of single-molecule fluorescence microscopy and coarse-grained computational modeling, we have developed a workflow to identify the connection between the non-helical topology induced by repetitive sequences and the intrastrand interactions that specify the detected topologies. DNA three-way junctions (3WJs) were designed with two arms as helical domains and one arm consisting of a defined number of trinucleotide repeats of the sequence CAG. These DNA constructs were labeled with fluorescent dyes for single-molecule FRET experiments to measure the bend angle as a function of the number of CAG repeats. As the number of repeats increased, the DNA became increasingly nonlinear and kinked. The coarse-grained modeling was performed via the oxDNA web server. With this software, thousands of potential structures were generated, which were then analyzed in terms of geometry and nucleotide-level bonding energies and intrastrand interactions. With this methodology, we are determining the size-dependent, specific nucleotide-level interactions that promote biologically relevant topologies associated with disease states.

◆ Poster 61 ◆

***Uptown Chicago Energy Benchmarking Research***

Presented By: Taylor Starkey

Through my time at the 46th Wards I was able to learn a lot about local politics. Through answering the phones, answering emails from constituents, and doing research tasks I have been able to develop important skills that will help me in future endeavors. I was able to take part in an energy benchmarking research project where the ward collected data on its biggest buildings to hold companies accountable for their energy consumption. To collect this research, I had to contact businesses, do extensive research, and rely on City of Chicago data. This project allowed me to combine my interest in politics with climate advocacy creating an enriching experience.



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◆ Poster 62 ◆

***Attitudes on Abortion Access***

Presented By: Sasha Shapsis

Supported By: Dr. David Doherty, Department of Political Science

Cook County is geographically located next to several states with suddenly-much-more-restrictive abortion laws. What do residents' abortion attitudes look like? Are they willing to devote resources to providing services to women from these neighboring states? A 2023 Cook County survey of around 1200 residents has revealed data on a new variety of abortion access challenges, including residents' willingness to donate or transport individuals, law enforcement, the issue of public spending, and more. By interpreting the results of different demographic groups, we can carefully draw conclusions on how Cook County residents feel about these underlying factors of abortion access.

◆ Poster 63 ◆

***MEAM: Movement, Expressivity, and Music***

Presented By: Kristina Humphrey; Mulcahy Scholars Program

Supported By: Dr. Elizabeth Wakefield, Department of Psychology

MEAM investigates the effect of body movement on expressivity and note accuracy in collegiate level string players. Using violinists, violists, and cellists from Loyola's orchestra, our study aims to answer what performers themselves think about using movement as a tool for expression, and whether movement (or no movement) while playing yields acoustical differences in note accuracy. Through two studies using string players and musical experts, we aim to discover how movement can be a tool to improve music learning and performance.

◆ Poster 64 ◆

***The Effect of Individual Differences on Gesture Learning***

Presented By: Sierra Webber

Supported By: Dr. Elizabeth Wakefield, Department of Psychology

Building off of decades of research showing that hand gestures are beneficial for learning, this study takes individual differences to approach to better understand how classroom teaching may be tailored toward individuals. Specifically, the study looks at how an individual's working memory capacity and propensity to spontaneously gesture on their own affects their likelihood to benefit from gesture instruction.

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◆ Poster 65 ◆

***A Qualitative Portrait of Experiences Among Ethnically Marginalized College Students***

Presented By: Kareem Touleimat

Supported By: Dr. Christine Li-Grining, Department of Psychology; Maria Radulescu, Department of Psychology

The present research examines the experiences of ethnically minoritized undergraduate students. In-depth interviews were conducted with a small sample of students attending a university in a Midwestern city. Through coding the interviews, several themes were detected. For example, students engaged in identity exploration and appeared to be in the "launching" phase of emerging adulthood. Some students actively reflected on their identities and revealed that ethnicity was not central to their identity. Also, some students showed that becoming more independent occurred in the context of student support offered by the university, such as faculty mentorship and a tutoring center.

◆ Poster 66 ◆

***Rainbows & Resources***

Presented By: Alexandra Ortega

Supported By: Dr. Rebecca Sifton, Department of Psychology; Natalie Juarez, Resource Development Associate

My poster captures my experience at Rainbows For All Children as a Social Media and Journalism Intern. This experience aided in my professional development, in terms of marketing and communications. It also captures my training as a small group facilitator for youth groups & adolescents navigating grief. During my time as an intern, I worked on Master Documents with international resources for incoming immigrants, people struggling with mental health, and more of one of which was proofed by a crisis worker.

◆ Poster 67 ◆

***Is Childhood Trauma Associated with Current Cognitive Disengagement Syndrome Symptoms in College Students?***

Presented By: Logan Phengsomphone

Supported By: Dr. Zoe Smith, Department of Psychology

This study will evaluate the connection between childhood trauma and current symptoms of cognitive disengagement syndrome (CDS) in college students. Cognitive disengagement syndrome is characterized by a combination of behavioral symptoms such as excessive daydreaming, mental confusion and fogginess, being lost in one's thought, and slowed behavior and thinking (Becker, 2021). CDS has comorbid symptoms that overlap with interpersonal

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childhood traumas (e.g., disengagement from environment; Musicaro et al., 2020), which calls into question whether trauma exposure may exacerbate CDS symptoms in later life. As anxiety, depression, and emotion dysregulation are also associated with childhood trauma, we will include those as covariates in our model. Ultimately, the purpose of the study is to evaluate the connection between childhood trauma and cognitive disengagement syndrome in college students.

◆ Poster 68 ◆

***The Impact of Community Integration on the Other Race Effect in Infancy***

Presented By: Trinity Bauer; Carbon Undergraduate Research Fellowship Program

Supported By: Dr. Maggie Guy, Department of Psychology; Dr. Timothy O'Brien, Department of Math and Statistics

The other race effect (ORE) is characterized by attentional and perceptual biases that benefit processing of a face of one's own race over a face of another race and is typically apparent by approximately 9 months of age (Kelly et al, 2007). Environmental exposure to other races has an impact on the development of the ORE (e.g., Bar-Haim et al., 2006). Using a paired-comparison task and measures of looking behavior, we seek to determine the effects of community racial diversity on the ORE in 9- to 12-month-olds from a large variety of communities across the United States.

◆ Poster 69 ◆

***The Influence of Multimodal Other-Race Exposure on the Development of the Other-Race Effect in Infancy***

Presented By: Osinigwe Ibekie

Supported By: Dr. Margaret Guy, Department of Psychology; Asli Bursalioglu, Department of Psychology

This study explores the Other Race Effect (ORE), which refers to the inability to distinguish and remember faces of other races. It investigates how audiovisual exposure impacts newborns' facial processing when presented synchronously and asynchronously. Multimodal stimuli have been shown to stimulate stronger infant attention and processing than unimodal stimuli (Bahrick & Lickliter, 2000; 2002). The study utilizes a familiarization trial to acquaint babies with the audiovisual stimuli and a visual paired comparison (VPC) trial to evaluate their ability to differentiate between faces of their own and other races.

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◆ Poster 70 ◆

***Mechanisms of Situational Dogmatism: The Role of the Default Mode Network in the Earned Dogmatism Effect***

Presented By: Nicolle Leon-Araujo; Mulcahy Scholars Program; Provost Fellowship

Supported By: Dr. Robert Morrison, Department of Psychology; Chad Osteen, Department of Psychology; Sydney Samoska, Department of Psychology

The Earned Dogmatism Effect suggests that self-perceived experts feel situationally entitled to being closed-minded to differing perspectives (Ottati et al., 2018). This study further explores this effect by exploring the role of the DMN in this process via a Transcranial stimulation to the posterior cingulate cortex (DMN) vs sham condition.

◆ Poster 71 ◆

***Recommendations for Increasing Cultural Sensitivity in IPT for College Students (IPC-CS)***

Presented By: Matt Shack

Supported By: Dr. Colleen Conley, Department of Psychology; Sarah Broner, Department of Psychology; Maya Hareli, Department of Psychology

Minoritized college students represent multiple groups within individualized contexts, therefore effective treatments for this population should reflect its diversity. An ongoing project at IMPACT lab is validating a short-form adaptation of group IPT for college students (IPC-CS) to serve this population. This poster will present the state of the literature of culturally adapted IPT, with a special focus on populations relevant to universities. It will then provide recommendations based on the literature and data collected at IMPACT for further accommodating diversity in university mental health interventions.

◆ Poster 72 ◆

***Neuromodulation of the Default Mode Network Enhances Forward Flow***

Presented By: DJ Capetillo; Carbon Undergraduate Research Fellowship Program

Supported By: Dr. Robert Morrison, Department of Psychology; Dr. George Thiruvathukal, Department of Computer Science

Creative cognition has been correlated, through previous research, with activity of the default mode network and executive control network. Using three multisite and double-blinded studies, we investigated the impact of both transcranial direct and alternating current stimulation (tDCS, tACS) on creativity. Study 1 (N=108) resulted in enhanced forward flow performance in those receiving tDCS to the posterior cingulate cortex (PCC) compared to sham stimulation. Study 2 (N=36) found that alpha-tACS to the PCC increased forward flow performance compared to

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sham stimulation. In Study 3 (N=13), we are attempting to replicate forward flow effects by utilizing tDCS, tACS, and sham stimulation.

◆ **Poster 73** ◆

***The Default Mode Network and Open-Mindedness Impact Political Rigidity***

Presented By: Chinedum Ekeh Chad Osteen, Nicolle Leon-Araujo, Cailor Bestwick, Diego Capetillo, Christina Sweiss; Mulcahy Scholars Program; Provost Fellowship

Supported By: Dr. Robert Morrison, Department of Psychology

The earned dogmatism effect states that experts are less likely to consider new ideas from someone they believe knows less than they do about a topic. In the study we investigated whether brain stimulation to the Default Mode Network can lessen this effect. During stimulation, participants were asked about their own political ideas, and then asked to share what political viewpoints that they believed would be worth hearing known as the latitude of acceptance. This latitude of acceptance was compared between sham and stimulated conditions.

◆ **Poster 74** ◆

***Education Plans Among Racially Minoritized Youth During the COVID-19 Pandemic***

Presented By: McKenzie Gallivan

Supported By: Dr. Christine Li-Grining, Department of Psychology; Maria Radulescu, Department of Psychology

The present research explores education plans and experiences during the COVID-19 pandemic among racially minoritized youth. Data were collected from predominantly Latinx and Black youth from under-resourced communities. Bivariate correlation analyses were conducted. The results found that experiencing more risk during the pandemic was positively correlated with attending a community college. Additionally, ethnic identity was positively correlated with both attending a community college and a 4-year college. These results suggest that a more positive ethnic identity may be protective for education plans in the context of the COVID-19 pandemic.

◆ **Poster 75** ◆

***Harm and Intent as Mediators of Detecting Hostile and Benevolent Partner Sexism***

Presented By: Therese Giannini, Claire Cerone; Provost Fellowship

Supported By: Danielle Kellogg, Department of Psychology; Dr. Tracy DeHart, Department of Psychology

The goal of the current study is to examine whether harm and intent mediate differences in detecting benevolent and hostile sexism by women partners in relationships (N=169). Women currently in heterosexual romantic relationships completed an online survey. We found that

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women were more likely to detect hostile sexism compared to benevolent sexism from their partner. These effects were explained by perceived harm and perceived intent. Specifically, women perceived more harm and intent in the hostile sexism condition than in the benevolent sexism condition, and therefore were more likely to detect hostile sexism.

◆ Poster 76 ◆

***Examining Temporal Synchrony Between Gesture and Speech Across Childhood Development***

Presented By: Connor Karwowski

Supported By: Dr. Elizabeth Wakefield, Department of Psychology; Dr. Eliza Congdon, Williams College

Individuals move their hands while they talk, or gesture, across age, and context (Goldin-Meadow, 1999). Church et al. (2014) found that speech and gesture were more temporally synchronized than speech and action. The goal of the present study is twofold: firstly, we aim to replicate the effect found in Church et al., and secondarily to determine the differences in temporal synchrony across childhood. To accomplish this, over Zoom, we asked participants to describe how they use household objects using both gestures and actions. We then compared the differences in onset times between speech and gesture vs. speech and action.

◆ Poster 77 ◆

***Psychological Well-Being, Executive Function, and Sleep Health Among Pre-Menarcheal Girls***

Presented By: Sofia Khatoon; Carroll and Adelaide Johnson Scholarship

Supported By: Hannah Hagy, MA, Liz Rea, MA, Dr. Amy M. Bohnert, PhD Stephanie J. Crowley, PhD, Frank Tu, MD, MPH, Kevin Hellman, PhD

Menarche is marked by numerous psychological, physiological, and cognitive shifts, including affect regulation, sleep, and executive functioning. The current study examines the relation between affect and various sleep parameters, and whether EF buffers this association in a sample of pre-menarcheal. Hierarchical linear regressions investigated the relation between psychological factors and sleep parameters and whether domains of executive function moderated the associations. The study found that more anxiety correlated with greater bedtime variability and sleep disturbance, less stress correlated with greater sleep disturbance, more depressive symptoms had greater bedtime and waketime variability, and more anger had greater bedtime variability.

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◆ Poster 78 ◆

***Measuring Trust in Doctors***

Presented By: Montserrat Villaseñor

Supported By: Dr. Dana Garbarski, Sociology; Dr. David Doherty, Political Science

Previous studies aimed at measuring trust in doctors and medical professionals have used vague questions with limiting answer choices. In our research we are aiming to broaden how trust is measured by varying three different sets of questions with different answer choices to our respondents to see how the measurement of trust changes.

◆ Poster 79 ◆

***Chicago's International Society for Krishna Consciousness, and Hinduism in Rogers Park***

Presented By: Michael Baker

Supported By: Dr. Yarina Liston, Department of Theology

Here, I will be presenting information on a Hindu temple, the International Society for Krishna Consciousness, and its history in Rogers Park, as well as a brief overview of Hinduism in Chicago, from their perspectives.

◆ Poster 80 ◆

***Engaged Learning: Bultasa Buddhist Temple***

Presented By: Joe Beima

Supported By: Dr. Yarina Liston, Department of Theology

In course Theology 299, Religions of Asia, students were tasked with visiting and learning about a religious location connected to one of the religions in our materials. This project reflects a study of the Bultasa Buddhist Temple in Chicago, IL.

◆ Poster 81 ◆

***Midwest Buddhist Temple***

Presented By: Alyssa Buttler

Supported By: Dr. Yarina Liston, Department of Theology

This research focuses on how the Midwest Buddhist Temple builds an inclusive community in the Lincoln Park neighborhood.

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◆ Poster 82 ◆

***Devon Gurdwara Sahib of Chicago***

Presented By: Michael Cilia

Supported By: Dr. Yarina Liston, Department of Theology

This presentation will cover my experiences at Devon Gurdwara Sahib of Chicago and what I learned about the Sikh religion. Summaries of three interviews will be given and their connections to the Religions of Asia course.

◆ Poster 83 ◆

***Buddhism at the Midwest Buddhist Temple***

Presented By: Tessa Cooke

Supported By: Dr. Yarina Liston, Department of Theology

Detailing the practices, rituals, and beliefs of the Midwest Buddhist Temple, and how it fits into the larger practice of Shin Buddhism.

◆ Poster 84 ◆

***Learning about Buddhism***

Presented By: Maria Diaz

Supported By: Dr. Yarina Liston, Department of Theology

Buddhism holds an impact on Chicago's culture as it has formed a community in the city. The Buddhist Temple of Chicago is a place of worship and one that has gained much attention. By learning about the religion from texts, visiting the site, and speaking to those that practice the faith, I have learned much about Buddhism beliefs and how they relate and differ from those of the Catholic beliefs of Loyola University and other religions overall.

◆ Poster 85 ◆

***The World Of Sikhism***

Presented By: Mohamed Eljerary, Arub Sumayli

Supported By: Dr. Yarina Liston, Department of Theology

This presentation will go into the fundamentals of the Sikh faith and my understanding of the individual Sikh practice after visiting a Sikh place of worship. I will present based on my observations from that visit, and try to convey what it means to be a Sikh follower.



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◆ Poster 86 ◆

***Visitation of Religious Site***

Presented By: Emmett Elward

Supported By: Dr. Yarina Liston, Theology Department

I will provide an account of my visit to the Shree Ganesh Temple of Chicago. I will reflect on what I learned from the experience as well as how I acted as an ambassador for Loyola's values.

◆ Poster 87 ◆

***International Society for Krishna Consciousness***

Presented By: Tera Joseph

Supported By: Dr. Yarina Liston, Department of Theology

My presentation will look into the International Society for Krishna Consciousness community. Their main message is to educate people to help them understand how to achieve happiness and live a life of harmony in accordance with the laws of nature. I view myself as an ambassador of Ignatian values and I will represent Loyola in a positive light by bringing positivity into this spiritual and immersive experience. The main goal of this experience is to learn and expand my knowledge of this religion and relay my findings to others.

◆ Poster 88 ◆

***The Spirituality and Faith of the Buddhist Temple of Chicago***

Presented By: Joshua Kliment Kliment

Supported By: Dr. Yarina Liston, Department of Theology

After learning about the holy doctrine and scriptures of many east Asian religions, I settled on learning more about Buddhism through visitation and study of the Buddhist Temple of Chicago. There is a particular focus on the practice and personal faith of the individual in this particular temple and the relationships between the individual, Buddhism, and Chicago/the US. I also take a dive into the history of the temple and how it has grown to be a part of its community.

◆ Poster 89 ◆

***Zen Buddhist Temple***

Presented By: Anna Kurina, Maura Green, Aidan Shoemaker, Jack Swenson

Supported By: Dr. Yarina Liston, Department of Theology

We interviewed members of the Zen Buddhist Temple in order to further our understanding of the Buddhist tradition and learn about their perspectives. This poster displays what we have

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learned from our interactions with members along with information that we have learned in our theology class.

◆ Poster 90 ◆

***Illinois Sikh Community Center Gurdwara***

Presented By: Madeline Masewicz

Supported By: Dr. Yarina Liston, Department of Theology

The Illinois Sikh Community Center Gurdwara is a religious sight that provides a common place for people of all religions to meet, and overall encompasses the Sikhism religion by donating and providing for others

◆ Poster 91 ◆

***Exploring Sikhism: History, Culture, & Traditions***

Presented By: Vernon Porio

Supported By: Dr. Yarina Liston, Department of Theology

This presentation will provide an overview of Sikhism's vast culture and history to embed a deeper understanding of this religion in its participants. By delving into the history of Sikhism, from its founding to its core tenets and traditions, the audience can gain a perspective on living a moral life. Through the interviews held with individuals from the Devon Gurdwara Sahib of Chicago regarding their personal experience with their faith, participants will have acquired insight into the unique practices and beliefs of Sikhism, and how such core influences have shaped the Sikh community over time.

◆ Poster 92 ◆

***The History of the International Society of Krishna Consciousness***

Presented By: Elena Roth

Supported By: Dr. Yarina Liston, Department of Theology

I will be interviewing the people of this society to find out more about the history of this temple and how it came to be.

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◆ Poster 93 ◆

***Shintoism: Practice and Belief***

Presented By: Jonathan Sallee

Supported By: Dr. Yarina Liston, Department of Theology

This presentation covers the research and information gathered from a visit to the Tsubaki Grand Shrine of America covering the beliefs and practices of believers in the Shinto faith, the native religion of Japan.

◆ Poster 94 ◆

***An Exploration of Buddhism***

Presented By: McKenna Sloan

Supported By: Dr. Yarina Liston, Department of Theology

This presentation will explore the many aspects of Buddhism as they apply real practitioners in the city of Chicago.

◆ Poster 95 ◆

***The Sikh Experience in the American Bible Belt***

Presented By: Michela "Skye" Whitsell

Supported By: Dr. Yarina Liston, Department of Theology

The 14th Amendment to the American Constitution prohibits the making of exclusionary laws toward ANY religion; however, from observation the promises of such proclamation seem to not be ratified in the fullest extent towards anyone outside of the Christian experience. I want to observe the parallels and divergences between southern Sikh religious services and those of the southern Catholics. The North Carolina School district is required to allow excused absences to students of any faith who miss due to religious observance, and Christian Holidays are the only guaranteed religious holidays offered. I seek to gain a better understanding about the Sikh religious experience and discover any barriers that can be dismantled so practicing their faith is respected.

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◆ Poster 96 ◆

***Midwest Buddhist Temple - Nayat Yacaman***

Presented By: Nayat Yacaman

Supported By: Dr. Yarina Liston, Department of Theology

Theology Department Midwest Buddhist Temple

For the engaged learning project, I am planning on visiting the Midwest Buddhist Temple. As a Catholic, I've been exposed to that single religion my whole life. Coming to college, I got the opportunity to meet people from different religions. Out of all the Asian religions, I find the Buddhist religion to be very interesting and diverse - something I'd like to learn as a Catholic. Experiencing Buddhism for the first time can impact my life in more than imagined ways. They see things profoundly and differently compared to other Asian religions. However, how in depth can you learn Buddhism from visiting a temple?

◆ Poster 97 ◆

***Buddhism in Chicago***

Presented By: Lannah Tamborello, Sophana Srisak

Supported By: Dr. Yarina Liston, Department of Theology

I visited a Buddhist place of worship right here in Chicago and these are my findings.

◆ Poster 98 ◆

***Exploration of the Sikh Faith***

Presented By: Yasmeen Shaikh

Supported By: Dr. Yarina Liston, Department of Theology

Through the cooperation of the Sikh Religious Society, I was able to visit the Gurudwara in Palatine to learn more about the Sikh faith. The board members gave me a tour of the Gurudwara and explained various components of the religion to me, including the practices that take place in the Gurudwara. This experience complemented the material I learned in class and helped me see the practices in real life.

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◆ Poster 99 ◆

***The Effect of Microaggressions on African American Couples' Cortisol Levels***

Presented By: Jocelyn Arroyo

Supported By: Dr. Tracy DeHart, Department of Psychology

The goal of this study was to examine actor-partner effects of microaggressions on African American couples' stress and cortisol levels. African American couples were recruited from the Chicagoland area to report their experiences over the past 3 months and to provide a hair sample to assess cortisol. Results indicated that actor and partners' reports of how bothered they were by microaggressions over the past 3 months were related to actors' cortisol levels. These results suggest that people and their partner's reports of how bothered they were by microaggressions were related to increased stress and cortisol levels in African American couples.

◆ Poster 100 ◆

***Bacterial Implications of Red Swamp Crayfish in the North Shore Channel***

Presented By: Mikayla Ballard

Supported By: Dr. Reuben Keller, Freshwater Ecology, SES; Dr. Gregory Palmer, Microbiology, SES; Ashley Williams, Associate Director of Academic Enrichment; Betsi Burns, Director of Learning and Student Success; Grant Dlesk; Keller Lab

Red swamp crayfish (*Procambarus clarkii*) are known to displace native aquatic species in Chicago. These invasive crayfish inhabit the North Shore Channel, a key waterway connecting Lake Michigan to the Chicago River. However, the Channel is also the location of a sewage outfall point that can harbor harmful contaminants, including fecal coliform bacteria, that adversely affect organism health. Bacterial plating suggests crayfish living below the outfall can harbor more potentially harmful bacteria. This also suggests organisms that consume invasive crayfish in polluted waters are at risk of consuming sewage-associated bacteria.

◆ Poster 101 ◆

***Small Scale Anaerobic Digestion in an Urban Environment***

Presented By: Amelia Bergbower; School of Environmental Sustainability Fellowship

Supported By: Dr. Greg Palmer, School of Environmental Sustainability; Dr. Gaj Sivandran

Anaerobic digestion has been used in wastewater treatment facilities at a large scale for over a century. Anaerobic digestion can be used to eliminate food waste and supply natural gas. This research aims to identify the future experiments that can be conducted to facilitate the use of small scale anaerobic digesters on campus.

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◆ Poster 102 ◆

***The Effect of Default Mode Network Transcranial Direct Current Stimulation on Open-Minded Cognition***

Presented By: Calior Bestwick Chinedum Ekeh, Nicolle Leon-Araujo, Diego Capetillo, Christina Sweiss, Sydney Samoska; Mulcahy Scholars Program

Supported By: Dr. Robert Morrison, Department of Psychology; Chad Osteen, Department of Psychology

Open-Minded Cognition (OMC) refers to a willingness to consider others' ideas and is related to the Earned Dogmatism Effect (Ottati et al., 2018). Open Mindedness is correlated with Default Mode Network (DMN) efficiency (Beaty et al., 2016). In this study we stimulated the DMN via tDCS to enhance OMC and decrease the Earned Dogmatism Effect. University students were assigned to a stimulation/sham condition and recalled situations where they knew more or the same as others. We measured OMC following each recalled situation. Preliminary results indicate the Earned Dogmatism Effect and a novel effect of stimulation on OMC.

◆ Poster 103 ◆

***Evolutionary Game Theory***

Presented By: Kathryn Cantrell; CAS Summer Research Fellowship

Supported By: Dr. Peter Tingley, Department of Mathematics and Statistics

While Game Theory often will reward noncooperative and antisocial strategies, the real world exhibits the need for cooperation. In this poster, I examined ways that cooperation can be encouraged by analyzing various setups including distributions of players across a given field. Players are randomly selected to play nearby players and perform a coded version of an altered version of the Prisoner's Dilemma. Players may either form offspring or be removed, determined by their scores. As more rounds are played, we note the proportion of cooperative versus noncooperative strategies and how they may change over the course of the simulation.

◆ Poster 104 ◆

***Building Structured Information from Unstructured Text***

Presented By: Chloe Clark, Kayleigh Currier, Adam Goode; Quinlan Research Assistant

Supported By: Peter Norlander, Associate Professor of Management, Senior Associate Dean for Graduate Programs and Faculty Affairs, Interim Director, MSHR Program, Loyola University Chicago, Quinlan School of Business Economic Security Project, Russell Sage Foundation

Using software tools developed at Loyola University Chicago, we are building measures of the employment practices of the largest U.S. companies using job advertisement text and mandatory filings from franchise firms. While the government mandates publicly traded firms report

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thousands of data points on their financial and accounting results, researchers, advocacy groups, and workers, do not have a comprehensive firm-level dataset on the behavior of large companies on critical matters of employment policy. Issues of social justice and sustainability, equality, human rights, and fair treatment are unmeasured.

◆ **Poster 105** ◆

***Cloning of Thioredoxin Reductase-2 from Drosophila Melonogaster for Characterization of Catalytic Activity and Thermal Stability***

Presented By: Mustafa Dahbur, Adrian Ibarra

Supported By: Dr. Emma Feeney, Department of Biology

The goal of this project is to accomplish the cloning of the gene Thioredoxin-reductase 2 (TrxR2) obtained from the male gDNA of *Drosophila melanogaster* into a pRSET-A vector using PCR- based cloning methods. This clone will be used to express the TrxR2 protein which will be functionally analyzed to contribute functional data to protein databases, like design2data (D2D). We hypothesize that TrxR-2 will biochemically function similarly to TrxR-1 based on the mechanism of catalysis the two proteins share.

◆ **Poster 106** ◆

***Red Light Cameras in Chicago***

Presented By: Rob Denman, Natalee Styrzula, Anya Lkhagvadorj, Giuseppe Fregoli

Supported By: Dr. Frederick Kaefer, Business - Information Systems

For our project, we decided to focus on the red-light cameras in the city of Chicago and how they affect people in low-income neighborhoods. For example, the south side is known for being a lower-income neighborhood. We plan to use data from various sources and formulate how to have those cameras in those areas. It is actually harming the citizens in those highly populated black and latino neighborhoods. The data that we plan to use for our project is sources of money the city made from those cameras over the years. While also using the data about the average income in those areas and the difference between when a normal stop light turns red and when one with a red light camera does. At the same time, the mayor and governor refuse to do anything regarding the matter. Our purpose is to bring light to these people's issues in these communities.

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◆ Poster 107 ◆

***Absorption of PCBs to Microplastic Beads***

Presented By: Evelyn Dewey; Mulcahy Scholars Program

Supported By: Dr. Paul Chiarelli, Department of Chemistry

Plastic pollution is ubiquitous. Plastic beads can absorb and transfer potentially toxic chemicals to marine animals and cause premature death. We are studying how effective different plastics are at transferring polychlorinated biphenyls (PCBs) to zebrafish. We have found that the more hydrophobic the plastic, the more compound it will absorb per unit area. Polyethylene is a more effective absorber of PCBs than polymethylmethacrylate. Polycellulose, the least hydrophobic plastic, will absorb the smallest amount of PCBs per unit area. We have exposed zebrafish to plastics with absorbed PCBs to determine which plastic is the most effective at delivering PCBs to fish.

◆ Poster 108 ◆

***Queer Communities: How the Use of Online Communities Fills Gaps In Access to Healthcare***

Presented By: Caelan Doherty; Provost Fellowship

Supported By: Dr. Dana Garbarski, Department of Sociology

My research will center around the Queer Online Community specifically how it relates to the healthcare of queer people. Queer people have a very unique experience with medical needs that are often out of the norms created by those of their cis-gender and heteronormative counterparts. The Queer community often is underserved in traditional medical settings due to lack of education, ignorance, and prejudice. There are not a lot of "official" medical resources designed specifically for the LGBTQ+ community. The question remains, where can we go to get the information we desire. My research will be based on the online queer community and how we share resources, experiences, and information about the medical field. I want to research to be centered around the experience of LGBTQ+ people and how they feel they can be better served by the medical community.

◆ Poster 109 ◆

***The Influence of Rhizobia on Legume Microbiome Formation and Functionality***

Presented By: Cian Dotson; Biology Summer Research Fellowship; Mulcahy Scholars Program

Supported By: Dr. Mike Grillo, Department of Biology

Leguminous plants overcome nitrogen deficiency by recruiting bacteria known as rhizobia that can fixate atmospheric nitrogen into biologically usable forms for plant growth and development. Legumes also form intimate relationships with a variety of other bacteria, archaea, and fungi known as the plant microbiome. Previous studies have demonstrated that rhizobia are among the



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most abundant members of the microbiome, suggesting they are essential organisms for microbiome formation and functionality. To elucidate further the coevolutionary relationship between legumes and rhizobia, 16S amplicon sequencing will be used to characterize the microbiome of legumes planted in soils with varying abundances of compatible rhizobia.

◆ Poster 110 ◆

***Effect of Water Level and Nutrient Concentration on European Frog-bit Growth***

Presented By: Spencer Dzyacky; Institute of Environmental Sustainability Undergraduate Research Fellowship

Supported By: Shane Lishawa, School of Environmental Sustainability

*Hydrocharis Morsus-ranae* (European Frog-bit; EFB) is a free floating aquatic plant native to Europe and Asia. EFB is an emerging invasive species within Great Lakes Coastal Wetlands that forms dense floating mats that negatively affect native biodiversity. For my experiment, I measure how varying levels of nutrient concentration and water depth affect the growth of EFB. I set up a greenhouse experiment of 4 different treatments with 10 replicates to be set in 5 gallon buckets from July 19th to August 20th. I found that low water depth and low nutrient concentration were optimal for EFB growth.

◆ Poster 111 ◆

***Reversing Somatic Hypermutations Affect the Catalytic Efficiency of Aldolase Abzyme 93f3***

Presented By: Tyler Galardy; Mulcahy Scholars Program; Provost Fellowship

Supported By: Dr. Zimmermann, Department of Chemistry and Biochemistry

The immune system goes through affinity maturation to produce antibodies that fight off an infection. During this process, some naïve B cells go through a series of mutations to increase their affinity and specificity for that specific antigen. This makes the antibody better suited to fight the antigen, but it also makes the binding efficiency significantly lower. Some of the mutations occur on the binding site, while others occur farther away. Reversing the mutations that are farther from the binding site may allow the antibody to continue its selective binding while also having a higher binding efficiency, allowing better immune response.

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◆ Poster 112 ◆

***Multimodal Models of Animal Sex in Scientific Literature: Breaking Binaries Leads to a Better Understanding of Ecology and Evolution***

Presented By: Isabella Gates, Anisha Pethkar, Marcus Piattoni, Alexis Rossi

Supported By: Dr. Sara Lipshutz, Department of Biology,

‘Sex’ is often used to describe a suite of phenotypic and genotypic traits of an organism related to reproduction. However, not all these traits are necessarily linked, and the rhetorical collapse of variation into a single term elides much of the complexity inherent in reproductive phenotypes. We conducted a meta-analysis of scientific literature to investigate how terminology related to sexual phenotypes changes over time. We find that the conflation of gender and sex has increased, and there is a mammalian bias in this conflation. We highlight how a more inclusive and expansive framework for sex can clarify studies of sexual diversity.

◆ Poster 113 ◆

***Spring Internship at the Chicago Council on Global Affairs***

Presented By: Emma Geiser

This semester I am interning at the Chicago Council on Global Affairs as a member of the Public Opinion/Survey team at the Lester Crown Center. I am concurrently enrolled in PLSC 370, the internship class for the Political Science department eligible for Engaged Learning. The goal for enrollment in this course is both to gain exposure working with political science topics in the real world and develop professional communication skills.

◆ Poster 114 ◆

***Analysis of Probiotics Being Administered to Colorectal Cancer Patients***

Presented By: Joely Gonzalez; CURA Scholars Program

Supported By: Dr. Michael Burns, Department of Biology

The discovery of the human microbiome has led to an increased interest in the role it plays in cancer. Emerging evidence suggests that there is a relationship between various types of cancers and the microbiome. More recently, the applications of probiotics in conjunction with cancer treatment have been observed. This project aims to evaluate the importance of bioinformatic analysis in current studies observing the effects and role of specific probiotics chosen in various cancer studies. This analysis focuses specifically on colorectal cancer and the administration of specific probiotics to diminish side effects from cancer treatment.

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◆ Poster 115 ◆

***Debating Gender Inequality in the American Social Sciences: Political and Institutional Explanations***

Presented By: Megan Grizzle; Social Justice Fellowship

Despite numerous, though unequal, legal, political, and social transformations since the 1960s, gender inequalities stubbornly persist in the United States. The field of social psychology has provided various theories to explain this persistence like theories of gender discrimination and sex biases. This research investigates how and why prejudice and discrimination came to dominate social psychological explanations of gender inequality and which other social psychology explanations did not gain the same traction. Through qualitative analyses of top social psychology journals, textual evidence displays trends and differences in the common approaches to gender inequality over the previous sixty years.

◆ Poster 116 ◆

***When Females Compete and Male Care: Phenotypic Differences in the Spotted Sandpiper (Actitis Macularius)***

Presented By: Alexandra Juarez; Mulcahy Scholars Program

Supported By: Dr. Sara E Lipshutz, Assistant Professor, Department of Biology; Tessa Patton, Graduate Student Mentor; Quinn Thomas, Lab Technician, Department of Biology

Spotted sandpipers (*Actitis macularius*) are migratory shorebirds that are special because they exhibit behavioral and morphological traits different from most species of birds. The females are sequentially polyandrous, and have multiple partners throughout the mating season. Additionally, they are sex-role reversed and express sexual dimorphism. What we know about this species comes from studies of a Midwestern population. We are not certain that similar characteristics will be present in our Californian population. Therefore, we are interested in evaluating these behavioral and morphological traits. In investigating the evolution of phenotypic variation, we can understand what makes this population and species unique.

◆ Poster 117 ◆

***Determining Developmental Conditions in the Dunning Population Using Dental Pathology***

Presented By: Ty List

Supported By: Dr. Anne Grauer, Department of Anthropology

Environmental conditions of human habitats can have a significant effect on one's development, with stressors and poor living conditions creating a lack in development. Dental pathology and enamel hypoplasia can be utilized to determine if someone's habitat was adequate and free of stressors that limited human development. Finding where on a tooth points of hypoplasia occur

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will allow us to better understand when a traumatic event occurred and can possibly let us understand a person's environment when the traumatic event occurred.

◆ Poster 118 ◆

***Development of a Socio-Scientific Air Quality Data Interface: A Pilot Study of Loyola's Inter-Campus Shuttle System***

Presented By: Emma McBride; Carbon Undergraduate Research Fellowship Program

Supported By: Zach Waickman, MBA, Senior Program Manager, School of Environmental Sustainability; Dr. Ping Jing, PhD, Associate Professor, School of Environmental Sustainability; Dr. William Honig, PhD, Associate Professor, Department of Computer Science

This project aims to study the socio-scientific impact of petroleum diesel bus emissions on air pollution by compiling a community-science air quality dataset through a comparative study of Loyola University Chicago's (LUC) shuttle bus system. Seven air quality sensors were strategically placed throughout the shuttle bus route system including at bus stops and inside and outside of buildings frequented by students and faculty. These sensors recorded GPS coordinates, PM<sub>2.5</sub> and VOC concentrations by minute. Data was used alongside GIS software to generate a heatmap of air quality across LUCs campuses, and to visualize particulate matter exposure over space and time.

◆ Poster 119 ◆

***Analysis of Water and Soil Quality Parameters to Determine the Effectiveness of Chicago Park Restoration Efforts***

Presented By: Kyleigh Miklos, Marinda Vacanti, Connor Olds, John Gorman

Supported By: Dr. Federico Sinche Chele

West Ridge Nature Park (WRNP) is a 21-acre park located in northern Chicago. Previously a dumping ground for waste from the neighboring Rosehill Cemetery, WRNP has been the target of ecological restoration efforts since 2015. To determine the effectiveness of these restoration efforts, water from the park's 4.5-acre pond and surrounding soil were tested for both nutrient content and heavy metals, with these findings compared against EPA standards for freshwater ecosystems. pH, phosphate, iron, ammonia, and chromium levels were found to exceed the EPA recommended ranges or values ( $\hat{I} \pm = 0.05$ ), indicating further restoration efforts are needed.

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◆ Poster 120 ◆

***Community Impacts of ISEIF Grants***

Presented By: Alexander Miranda; Center for Urban Research and Learning (CURL) Fellowship  
Supported By: Dr. Christine George, CURL; Teresa Neumann, CURL

The Illinois Science and Energy Innovation Fund which is sunsetting this year has provided grants to various neighborhood and statewide organizations doing grassroots organizing and public education to change consumer behaviors around energy use. Our research focuses on the ISEIF funding model, and how the grantees experienced the grant making process and how it impacted their work. CURL and Outlier collaborated to distribute surveys and hold focus groups on the grant experience. Preliminary survey results revealed the funding model aligned and strengthened the organization's grass roots initiatives. Among the most successful grassroots work were youth STEM based programs, and programs working with adults with less than a high school education.

◆ Poster 121 ◆

***Utilizing Biochar to Restore Damaged Ecosystems***

Presented By: Madeline Palmquist  
Supported By: Dr. Brian Ohsowski, School of Environmental Sustainability

Due to agricultural and road salt runoff, wetlands can become sites of high nutrient loads and high salinity rates. Biochar can bond to these ions and possibly help sequester the harmful salts and nutrients. We designed an experiment to test how biochar interacts with different rates of fertilizer and road salt in an aquatic environment over different time intervals. We analyzed the experimental biochar's chemical composition to discern biochar's ability to bind to these ions. The outcomes and effectiveness of this experiment can help the scientific community better understand biochar's chemical behavior and its application in wetland restoration practices.

◆ Poster 122 ◆

***The Criminalization of Homelessness in Chicago***

Presented By: Emily Porter; Provost Fellowship  
Supported By: Dr. Blackmond Larnell, Department of Political Science

Community organizations report that Chicago was experiencing a rise in homelessness before the global pandemic, which pushed more people into a state of homelessness. City leaders admit to needing more resources to address the larger number of people living on the street. History, however, shows that cities often turn towards policies that criminalize the homeless when the "problem" becomes more visible, overwhelming public spaces and spreading into wealthier spaces thereby threatening local revenues and electoral security of officials. Given the hierarchy

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of spaces, these communities are valued more by elected officials and city bureaucrats. In an effort to appease tax paying citizens that vote and help finance city services, local governments focus on crimes associated with homelessness (e.g. loitering, trespassing). In this study, we will examine the occurrence of these types of crime and spatial differences in the communities where these "crimes" occur. More specifically, we are interested in examining whether crimes associated with homelessness occur more frequently in higher income areas and predominantly white spaces despite housing insecurity having a considerably larger effect on Black, Latinx, immigrants, and low-income people who live in different areas of the city. If so, city governments must consider providing free housing in wealthier spaces rather than arresting and incarcerating some of the cities' most vulnerable residents and confiscating their property.

◆ **Poster 123** ◆

***Using Natural Language Processing to Find Social Determinants of Health in Electronic Health Records***

Presented By: Maya Rao

Supported By: Dr. Kathleen Bobay Department of Nursing

A knowledge map was created and validated to use with an innovative natural language processing engine to find social determinants of health variables in narrative text in electronic health records.

◆ **Poster 124** ◆

***Review of Child Relief Expeditors and Domestic Violence Courts***

Presented By: Ava Savelkoul, Mia Sedory and Alex Miranda; Center for Urban Research and Learning (CURL) Fellowship

Supported By: Yasmeen Khayr, Circuit Court of Cook County Domestic Violence Division

The Child Relief Expeditor (CRE) role was created through the Family Court Enhancement Project at the Circuit Court of Cook County Domestic Violence Division in partnership with the Center for Urban Research and Learning. Judges at the domestic violence court deferred civil Order of Protection cases with shared children to the CRE which supported parent litigants by assisting in the development of agreements regarding communication, exchanges, and visitation plans between petitioner and respondent parents. The increased use of the CRE helped create safe parenting agreements and improve safety outcomes.

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◆ Poster 125 ◆

***The Two-Generation Housing and Neighborhood Study***

Presented By: Mia Sedory, Michael Reda; Center for Urban Research and Learning (CURL) Fellowship

Supported By: Dr. Christine George, CURL; Dr. Peter Rosenblatt, Department of Sociology; Yasmeen Khayr, CURL; Travis Moody, CURL

Research and housing policy has begun to coalesce around the idea that moving to low-poverty, opportunity-rich neighborhoods can be beneficial for low-income adults and children and that staying in such neighborhoods could extend these beneficial outcomes. The Two-Generation Housing and Neighborhood Study has been conducting interviews with household heads and youth in Chicago and Cook County, Illinois, who have been recipients of federal Housing Choice Vouchers and offered coaching to address this knowledge gap, assess the effectiveness of the program and to understand how the experiences of adults and children impact whether or not they stay in opportunity areas.

◆ Poster 126 ◆

***Single Molecule DNA Looping Assay***

Presented By: Leah Smith; Mulcahy Scholars Program

Supported By: Brian Cannon, Department of Physics; Cole Geinosky, Department of Physics

Proper three-dimensional organization of the genome is required for cells to coordinate and control gene activity. Supercoiling is a critical process in compacting DNA into tightly wound structures to organize the genome. Formation of DNA mini circles via looping is an important, early step in this process. Here, we are working to develop a single-molecule fluorescent assay to monitor DNA loop formation in real-time. We are using polymerase chain reaction (PCR) to generate dye-labeled constructs of different sequences. High and low levels of NaCl are used to induce looped and unlooped formations of the DNA that give distinct high and low FRET signals, respectively. Non-helical regions associated with genetic disorders, such as spinocerebellar ataxia and ALS, disrupt genomic organization. With this assay, we aim to track looping activity in real time and study how defects within the helical domain associated with such genetic disorders affect the looping process and how it can lead to genomic disorganization.

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◆ Poster 127 ◆

***Overview of Instruments of Measurement for Perceived Discrimination***

Presented By: Solea Smith

Supported By: Dr. Karen Saban, Edward Hines Jr. VA; Betsi Burns, Director of Learning and Student Success

The purpose of this study is to examine the current tools of measurement for perceived discrimination. Specifically to investigate the number of tools of measurement available, similarities and differences between different tools available, and possible gaps in these tools of measurement. Literature shows the impact of perceived discrimination on both physical and mental health, but little literature exists on the quality and quantity of tools of measurement for perceived discrimination. By investigating current tools of measurement improvements may be made in the collection and analysis of such data.

◆ Poster 128 ◆

***Preventing the Passage of Invasive Aquatic Invertebrates into Lake Michigan***

Presented By: Sarah Sukanen; Mulcahy Scholars Program

Supported By: Dr. Reuben Keller, School of Environmental Sustainability; Rachel Rogers, School of Environmental Sustainability; Dr. Robert Polak, Kent State University

The electric barrier in the Chicago Area Waterway System (CAWS) is operated to prevent Asian Carp from entering Lake Michigan. Invasive aquatic invertebrates also threaten Lake Michigan, but the effectiveness of the barrier against these species is unknown. A lab-scale electric barrier was designed to study this risk. First, the research studied how invasive aquatic invertebrates are affected by the undistorted electric field. Second, since there also exists a possibility that these species may travel through the barrier near or attached to a barge or tug traveling in the canal, the possible distortions that may occur in the electric field due to the presence of the barge was studied.

◆ Poster 129 ◆

***The Feminization of Frontal Lobotomies: A Critical Analysis of Gender and Queerness in the Lobotomy Era***

Presented By: Missy Tepe; John Grant Fellowship in Bioethics

Supported By: Dr. Jennifer Parks, Department of Philosophy

The history of frontal lobotomies is fraught with unsafe techniques and the stigmatization of mental illness. Patients were left mentally incapacitated, resulting in a docile demeanor that made clinical management easier. Women, specifically lesbians, were largely targeted, as they were more likely to be diagnosed as having behaviors or attractions that required "correcting."



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Evaluating the socio political atmosphere for women and the practice as a form of conversion therapy and comparing transorbital lobotomies to transphobia in contemporary medicine, I conclude that the gender biases against women and negative attitudes toward queer patients that informed the practice of lobotomy are still present.

◆ Poster 130 ◆

***Understanding the Role of the SIFa Receptor in the Drosophila Feeding Rhythms and Circadian Rhythms***

Presented By: Anayatz Velazquez; Provost Fellowship

Supported By: Dr. Daniel Cavanaugh, Department of Biology

*Drosophila melanogaster*, known as the fruit fly, has pars intercerebalis (PI), which is homologous to the Mammalian hypothalamus. The mammalian hypothalamus is a structure in the brain that produces hormones (signal molecules) that control hunger. The PI also uses signal molecules to regulate feeding rhythms in the *Drosophila*. One molecule that has been identified is SIFamide (peptide).

◆ Poster 131 ◆

***Infrared Spectroscopy for the Rapid Detection and Quantification of Hexavalent Chromium in Urban Areas***

Presented By: Gracie Walker; SES Fellowship

Supported By: Dr. Chad Johnston, Department of Engineering

Hexavalent chromium (Cr(VI)) is a toxic metal and common soil and groundwater contaminant. It is also regularly detected in the water distribution systems of cities like Chicago, IL. Due to the public health risk posed by Cr(VI) contamination, it is desirable to have inexpensive and rapid methods for detecting Cr(VI) in environmental samples. This project seeks to investigate the use of Fourier transform infrared spectroscopy (FTIR) to detect and quantify Cr(VI) in contaminated soils. As a rapid and non-destructive technique, FTIR is a promising alternative method for analyzing contaminated soils. In addition, this project aims to collaborate with Chicago communities which are affected disproportionately by industrial contamination.

◆ Poster 132 ◆

***Acshion Presentation***

Presented By: Joseph Ward

This deliverable will be based on my design thinking marketing class in which we are helping an architect better his business ideas for a waterpark.

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◆ Poster 133 ◆

***Exploring How Schools Support Newcomer Students and Parents***

Presented By: Elani Williams

Supported By: Susana Sosa, M.A., Yvita Bustos, M.A., Dr. Catherine DeCarlo Santiago,  
Department of Psychology

The purpose of this study is to investigate how schools support newcomer families through mixed-methods analysis. Qualitative analysis was conducted with parent and student interviews. Quantitative analyses will be conducted with student surveys. Mixed-method approaches will be used to integrate overall findings of support among newcomer families after resettlement.

◆ Poster 134 ◆

***The Secret of Clay: An Inquiry into Provenience and Function of Roman Era Flasks***

Presented By: Mikolaj Wrobel, Vern Abraham

Supported By: Dr., Christopher Hernandez, Department of Anthropology; Dr. Jennifer Muslin,  
Department of Classical Studies

It doesn't take an Indiana Jones to recognize looting as a ghastly stain on the fabric of archaeology. Regrettably, as research assistants in the Anthropology Department's Father Grollig collection, we have discovered two Roman funerary flasks which we have reason to believe have come into the university's possession through this historical blemish. Henceforth, our aim is to erase the smear of looting from the university by weaving the thread of inquiry through the origin, history and functionality of the two flasks, with the hope that analyzing the fabric of clay will cleanse the fabric of the university.

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# UNDERGRADUATE RESEARCH AND ENGAGEMENT SYMPOSIUM AWARDS

McCORMICK LOUNGE, COFFEY HALL  
3:45 PM - 4:30 PM

## **OUTSTANDING UNDERGRADUATE RESEARCH AWARD**

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.

## **MARY THERESE 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.

## **ADOLFO NICOLAS SJ EXCELLENCE IN ENGAGED LEARNING AND TEACHING AWARD**

This award recognizes an instructor who brings innovation, imagination, and dedication to an Engaged Learning course. These are faculty members who seek to ensure deep connections between course content and the larger world and cultivate students who seek to use their education to build a more just and humane world.

## **COMMUNITY ENGAGEMENT AWARDS**

Community Engagement Awards 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 the community through their Engaged Learning Courses.

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## **LEARNING PORTFOLIO REFLECTION AWARDS**

A learning portfolio (ePortfolio) is a digital collection that demonstrates a student's work over time, featuring skills, abilities, values, experiences and reflections. The Learning Portfolio Award will be given to a student or group of students who cultivated and curated an excellent portfolio throughout a program or academic course at Loyola University Chicago during the academic year.

## **COMMUNITY PARTNER AWARD FOR COEDUCATION**

The Community Partner Award for Coeducation exists to recognize and celebrate partner organizations who not only are doing great work for their community, but are also undertaking additional effort to serve as partners in education working with Loyola students at their organization.

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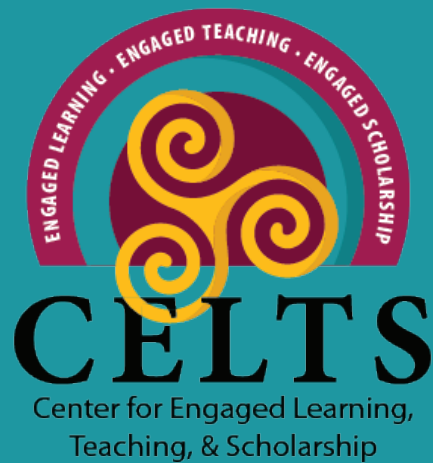
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