

The Undergraduate Research and Engagement Symposium



The Power of Inquiry: Igniting Curiosity and Creativity
Loyola University Chicago

April 20, 2024



The Power of Inquiry: Igniting Curiosity and Creativity

Welcome to the **2024 Undergraduate Research and Engagement Symposium** at Loyola University Chicago! 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, *The Power of Inquiry: Igniting Curiosity and Creativity* celebrates student scholarship, research, and community engagement projects that they have explored through the past year.

For the past 16 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' research, engagement, and scholarly work, the symposium provides space for reflection and critical interrogation into many topics from disciplinary, transdisciplinary, 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 the 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 2024 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, staff, and community partners, 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 these scholarly projects are presented today in various formats, from posters to oral presentations and learning portfolios, as well as other creative works.

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 University Chicago 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. To learn more about the undergraduate research program (LUROP), please visit www.luc.edu/lurop. May the Symposium provide you with new insights, audacious 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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*Program design and front cover image created by Loyola students:
Kayla Carizey, AJ Vargas, and Francesca Dreher*

PROGRAM SCHEDULE

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

Undergraduate Research in Dance Performance _____ 11:30 AM - 12:15 PM
(*Practice-led Research in Dance by Loyola Dance Theater* - Mundelein 409)

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

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

Recognition Ceremony _____ 3:45 PM - 4:30 PM
(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 Learning*
- ❖ *Community Engagement Award*
- ❖ *Learning Portfolio Award*
- ❖ *Community Partner Award for Coeducation*

LOYOLA UNDERGRADUATE RESEARCH OPPORTUNITIES PROGRAM (LUROP)

In addition to hosting the 2024 Undergraduate Research & Engagement Symposium as part of the Center for Engaged Learning, Teaching, and 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. 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 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

The John Grant Endowment for Health Care Ethics offers three research fellowships in bioethics. These fellowships are 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 destination in Asia during the 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 (SES) 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.

The William and June Pizzi Undergraduate Research Fellowship

The Pizzi Undergraduate Research Fellowship is a one-year fellowship for students majoring or minoring in Neuroscience.

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.

Research and Engagement Poster Presentations: Session 1

11:00 AM - 12:30 PM

◆ Poster 1 ◆

Microbial diversity of two sex-role reversed bird species

Presented By: Kimberly Acosta; Mulcahy Scholars Program

Supported By: Dr. Jennifer Houtz, Allegheny College; Dr. Sara Lipshutz, Duke University

Mating systems, such as monogamy and polygamy, are reflected in the microbial communities of the vertebrate hosts. However, the effect of sex-role reversal on gut microbiome diversity is understudied in wild vertebrate hosts. To answer this question, we sampled the cloacal microbiome of males and females from two bird species which exhibit sex-role reversal, Northern Jacanas (*Jacana spinosa*) and Wattled Jacanas (*Jacana jacana*). We characterized the microbial diversity using 16S rRNA sequencing and analyzed our results in QIIME2 and R. Our results can help us understand how mating systems may impact the physiological and ultimately fitness of wild vertebrate hosts.

◆ Poster 2 ◆

Lactobacillus species shared between the female urinary and vaginal microbiota

Presented By: Haley Atkins; Mulcahy Scholars Program

Supported By: Dr. Catherine Putonti, Biology

The female urinary tract and vagina contain many of the same *Lactobacillus* species and communities dominated by lactobacilli are typically associated with “health” or a lack of symptoms. Reduced numbers of lactobacilli have been associated with lower urinary tract symptoms. Studies where both the urinary tract and vagina were sampled from the same female participant have identified similar genera and similar strains, supporting the current hypothesis that the urinary and vaginal microbiota are connected. Building off these studies, we explored strains of the same *Lactobacillus* species found in the urinary tract and vagina of the same individual to see if the strains were genotypically similar or the same. Through our research, we found a clear connection between the urinary tract and vaginal communities.

◆ Poster 3 ◆

Introducing *Pseudomonas aeruginosa* phage Spongy

Presented By: Alexis Avalos; Mulcahy Scholars Program

Supported By: Dr. Catherine Putonti, Biology

Pseudomonas aeruginosa is an opportunistic pathogen that has increasingly been a concern with regard to human health given its resistance to multiple antibiotics. To overcome this challenge, Western medicine has renewed interest in an alternative solution, the use of bacteriophages, i.e., phage therapy. Phages have been successfully used to combat *P. aeruginosa* infections including aortic graft infections, chronic rhinosinusitis infections, chronic lung infections, and urinary tract infections, to name a few. To increase our catalog of *P. aeruginosa*-infecting phages for future therapeutic use, we have been isolating temperate phages from clinical isolates. Here I present the temperate phage Spongy, induced from *P. aeruginosa* UMB7777, which was isolated from a catheterized urine sample. *P. aeruginosa* UMB7777 was predicted to contain three intact prophages by PHASTER. Using PCR primers, I was able to confirm that a single phage had been induced. The prophage sequence is 26,018 nucleotides long and is most similar to the siphovirus Casadabanvirus D3112. Next, I conducted host range assays for Spongy, testing it against 18 urinary *P. aeruginosa* strains and the ATCC strain. I found that Spongy was capable of lysing 17 of these strains. This suggests that Spongy is an ideal candidate for future investigation and engineering for phage therapy.

◆ Poster 4 ◆

Using Creative Infographics to Solidify Concepts in Biochemistry

Presented By: Luke Baumel

Supported By: Dr. Polina Pine, Chemistry and Biochemistry

In the field of chemistry, the utilization of visual representation such as diagrams and illustrations is vital for comprehending interrelated concepts. Advancements in technology for note-taking have the potential to enhance the effectiveness and accessibility of biochemistry education. The use of concise infographics as an instructional tool can facilitate better retention of knowledge and foster the development of critical thinking abilities that extend beyond an academic setting. The implementation of innovative technology to create infographics can sustain an inclusive learning environment that accommodates a diverse student population.

◆ Poster 5 ◆

Genesis and The American Court

Presented By: Remy Beauchamp

Supported By: Dr. Lauren O'Connell, Theology

This presentation follows the development of American law in relation to Genesis. We have all heard of the governmental ideal of "separation between church and state", but is that the reality? Over the course of the Spring 2024 semester, I reviewed controversial decisions made by courts across the United States concerning women's and LGBTQ+ rights. These court decisions frequently cited biblical texts, especially the creation narratives in Genesis and natural law. This analysis serves to recognize the thriving relationship between Christianity and the American government that is often swept under the rug.

◆ Poster 6 ◆

Inhibitors of the Bacterial Enzyme ArgE as Potential New Antibiotics

Presented By: Alayna Bland; Mulcahy Scholars Program

Supported By: Dr. Daniel Becker, Chemistry and Biochemistry; Emma Kelley, Chemistry and Biochemistry

Bacteria are becoming increasingly resistant to antibiotics, and therefore there is an urgent need to discover novel antibiotics targeting alternate pathways. This project studies inhibitors of zinc metalloenzyme acetylnithine deacetylase (ArgE), an enzyme found in the arginine biosynthesis pathway of bacteria. Inhibiting this enzyme would kill bacteria without mechanism-based toxicity to humans. We screened classes of potential inhibitors and tested compounds in a 214 nm assay, finding IC₅₀ values for the most potent inhibitors. We also tested select inhibitors in a thermal shift assay with *Escherichia coli* ArgE to determine the stability of the enzyme in the presence of inhibitors.

◆ Poster 7 ◆

Farmer's Market Flower and Herb Transportation and Display

Presented By: Isabella Bonaldo, Bryan Hufano, Jady Harris

Supported By: Kevin Erickson, Urban Agriculture; Dr. Gail Baura, Engineering

This presentation will describe the process of making and testing a new form of transportation for the flowers and herbs being brought to a farmer's market. The original form of transportation was damaging the products, and not as efficient as it could have been. Over the fall semester, we worked by testing a multitude of designs to find which one was the best option. We were able to provide a product to our sponsor that was not only much more attractive, doubling as a display, but more

secure and durable. Through this project, we expanded our knowledge of a new method of testing experiments as well as our skills we used to build the boxes themselves.

◆ Poster 8 ◆

Characterization and Analysis of B-Glucosidase B (BglB) Mutant M114S

Presented By: Veronika Bonifacy, Maya Sharma

Supported By: Dr. Emma Feeney, Biology, Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

The goal of the Design to Data project is to improve the ability of modeling software to predict protein function from structure. We generated a single point mutation in BglB, M114S, and performed kinetic and thermal assays to gather empirical data. Based on previously published data on similar mutations, such as M261D, and an overall change in Foldit score greater than 1, we hypothesize that M114S will demonstrate decreased catalytic efficiency and thermal stability in comparison to the wild type. We were unable to come to any conclusions regarding our hypothesis as our data indicated that M114S was not expressed.

◆ Poster 9 ◆

Female Contraceptive Use in Uganda

Presented By: Ava Borrego, Swetha Ramkumar, Ling Tubbs

Contraceptive usage in Uganda has been a topic of concern, with varying rates of adoption and sustainability across different regions and demographics. This study aims to investigate the effectiveness of educational and informational sessions in promoting sustainable contraceptive usage among women in Uganda. The research hypothesis suggests that women who are educated and informed on the benefits and results of contraceptives will exhibit higher rates of sustainable contraceptive usage compared to those in regions without these interventions. Additionally, the study will explore the potential decline in contraceptive use among women in rural areas and unmarried women, which results in unplanned pregnancies and sexually transmitted infections. By analyzing data on contraceptive usage rates, demographic information, and the presence of educational and informational sessions, this research seeks to provide insights into the factors influencing contraceptive adoption and sustainability in Uganda.

◆ Poster 10 ◆

Dark Matter Capture in the Center of the Galaxy

Presented By: Sofija Brnovich, Daniel O'Shea

Supported By: Dr. Walter Tangarife, Physics

Since dark matter cannot be directly observed, it has to be studied by observing its effect on visible matter. The center of our galaxy has a high density of dark matter particles and so it is an ideal place to study dark matter effects on visible bodies, such as stars. The aim of this project is to understand the effects of dark matter capture on stars in the vicinity of the center of the galaxy.

◆ Poster 11 ◆

Learning Challenging Chemistry Concepts through Cartoon Representation

Presented By: Anna Buttell

Supported By: Dr. Polina Pine, Chemistry and Biochemistry

This presentation explores an innovative pedagogical approach to teaching chemistry and biochemistry using creative cartoon analogies, aiming to bridge the gap between traditional methods and diverse learning styles. Visual storytelling transforms abstract ideas into memorable narratives, showcasing real-life examples to elucidate challenging concepts of biochemistry. Additionally, it features a workbook co-authored by an instructor and undergraduate student, demonstrating the

practical implementation and effectiveness of this approach. "Cartoon Chemistry" seeks to inspire educators to embrace innovative teaching methods, fostering a playful learning environment that empowers students to approach science with curiosity and enthusiasm for a more enjoyable educational experience.

◆ Poster 12 ◆

Determining the Catalytic Efficiency and Thermal Stability Effects of the β -Glucosidase B (BglB) H328N

Presented By: Marian Castro, Emma Katubig

Supported By: Dr. Emma Feeney, Biology, Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

This presentation will describe the experience of generating a mutant enzyme, characterizing its function, and making protein function predictions. We hypothesize that β -Glucosidase (BglB) mutant H328N will be similar in the catalytic efficiency (kcat/KM) in comparison to the wild type because its overall Foldit score suggest a high likelihood of expression and intermolecular modeling analysis (local score) also points to slightly increased local interactions as both histidine and asparagine are hydrophilic. The local score of the wild type changes from 1.250 to a mutated score of 1.625, resulting in a small increase in score. Furthermore, previously published data on similar mutation H328K bolster this hypothesis.

◆ Poster 13 ◆

Analysis of Heavy Metals in White Grape Vinegar

Presented By: Yasmina Chammas; Research Mentoring Program

Supported By: Monika Rasic, Chemistry and Biochemistry; Dr. Martina Schmeling, Chemistry and Biochemistry

Heavy metals such as Cr, Pb, and Cu can be contained within grapes because of growth on contaminated soil, pesticide application and transport and storage in contaminated containers. Vinegar is made in a highly industrialized process involving stainless steel vessels but is also known to be aged in wooden oak. The oak barrels are often held together by metal and leaching of heavy metal contaminants can occur into the vinegar. The goal for this study is therefore to analyze the concentrations of heavy metals, during the fermentation process of white grape vinegar in different vessels and at various stages of maturation. The white grape vinegar for this study will be made using four different containers: small oak barrels, glass jars, stainless steel, and plastic containers. Analysis of heavy metals within the fermented white grape vinegar will be performed using GFAAS.

◆ Poster 14 ◆

Building Polygenic Risk Scores in Diverse Populations with the All of Us Research Program

Presented By: Grace Chilton; Biology Summer Research Fellowship

Supported By: Dr. Heather Wheeler, Biology

Polygenic risk scores combine effects of individual single nucleotide polymorphisms to estimate susceptibility to a phenotype. There remains a scarcity of studies involving African-origin populations. The Pan-UK Biobank project has made public their multi-ancestry GWAS results across 6 different ancestral groups, including Africa. The All of Us Research Program is working to build a diverse health database that includes paired genotype and phenotype information. The information in the Pan-UK Biobank and the All of Us database will allow us to build polygenic risk scores and replicate our previous efforts. Our work is integral in addressing disparities in precision medicine.

◆ Poster 15 ◆

Availability of nitrogen and phosphorus in biochar-amended wetland soil with various redox conditions.

Presented By: Clara Copps

Supported By: Shane Lishawa, School of Environmental Sustainability; Sam Schurkamp, School of Environmental Sustainability

This greenhouse experiment explores the effect of biochar on nutrient pollution under varying redox regimes. I added biochar sourced from invasive cattails at two rates along with nutrient pulses of 5mg/L phosphorus and 10 mg/L nitrogen to 36 mesocosms with 3 different watering regimes (dry, moist, saturated). I monitored redox conditions with IRIS strips and collected nutrient data with ion chromatography and PRS probes. I expect that the biochar application in the “dry” treatment will yield the highest soil nutrient levels, implying that reduced conditions limit the effectiveness of biochar as a soil amendment.

◆ **Poster 16** ◆

Squad Jackpot EdTech Research and Insights

Presented By: Robert Cramer, Liam Scott, Panth Patel, Lauren Ingol, Tommy Howell, Frank Lang, Rafaella Barquet

Supported By: Dr. Stacy Neier Beran, Business

This presentation explores the impact of emerging educational technology on classrooms and beyond. It evaluates its effects on comprehension, classroom dynamics, remote learning, and socioeconomic disparities. The project focuses on how new technology influences consumer education worldwide. Using qualitative interviews, focus groups, and quantitative surveys, it examines technology's influence on learning outcomes, teaching methods, and educational disparities. As technology continues to evolve, the research aims to guide stakeholders in making informed decisions for the future of education. By providing insights for policymakers and educators, it seeks to enhance educational experiences and ensure equitable access to quality education.

◆ **Poster 17** ◆

The religious practices of Hinduism in the Greater Chicago area

Presented By: Justyna Czopek, Iza Flores

This spring semester, a component of the course “Religions of Asia”, required students to visit a religious site related to the Indo-Asian religions studied throughout the course. My partner and I visited the Hindu Temple of Greater Chicago in Lemont, Illinois. As part of our visit there, we photographed the temple buildings and conducted interviews with three people. The interview covered questions about the history, the religious services, the demographics of the attendees, etc. Through this project, we were able to compare and contrast the beliefs of the religion that we learned in class to the first-hand experiences of its believers.

◆ **Poster 18** ◆

Comparative Analysis of Thermostability and Catalytic Efficiency of BglB(A80S) in Comparison to Wild-Type BglB

Presented By: Arben Dardovski, Romuald Bezdziecki

Supported By: Dr. Emma Feeney, Biology, Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

BglB is a protein that catalyzes the hydrolysis of glycosidic bonds, releasing glucose. We hypothesized that β -glucosidase (BglB) mutant A80S will demonstrate similar catalytic efficiency (kcat/KM) and increased thermal stability (T50) in comparison to the wild type because its overall Foldit score suggests an expression is likely. Additionally, intermolecular modeling analysis (local score) also points to increased local interactions due to three more hydrogen bonds

being formed. This increase in hydrogen bonds can improve the overall stability of the protein without harming its catalytic efficiency. Furthermore, previously published data on similar mutations, such as A80P, support this hypothesis.

◆ **Poster 19** ◆

Health Threat Effects on Social Dominance Orientation

Presented By: Eleanor Desing; Provost Fellowship

Supported By: Dr. Jeffrey Huntsinger, Psychology; Samantha Chambers, Psychology

Social Dominance Theory (Sidanius and Pratto, 1999) and Social Dominance Orientation (SDO) capture individuals' preferences for established social hierarchies. This study seeks further evidence of a health hierarchy (Raoul, 2023) and research relating to symbolic ableism. Participants face a health threat manipulation, being randomly assigned as high or low risk for an immunodeficiency condition. We hypothesize that those with high levels of SDO exposed to the high threat condition will have lower levels of symbolic ableism compared to those in the low threat condition. This study provides valuable ableism management information, important in the context of the Covid-19 pandemic.

◆ **Poster 20** ◆

Examining Hygiene Disparities In Haiti: A Comparative Analysis of Wealth Index Scores between Rural and Urban Environments

Presented By: Grace DiCola, Jimmy Blaine, Jennifer Gaucin

Supported By: Dr. Tara Casebolt, Health Sciences and Public Health

This research delves into the hygiene disparities prevalent in Haiti focusing on soap usage in hand washing. We are focusing on the comparison of wealth index scores between rural and urban environments. Through a comprehensive statistical analysis, it investigates the differential access to soap and hygiene education across these settings. Understanding these dynamics is crucial for designing targeted interventions aimed at promoting equitable access to hygiene resources and enhancing public health outcomes in Haiti.

◆ **Poster 21** ◆

Characterizing the expression, kinetics, and thermal stability of the V52F Mutation in the β glucosidase (BglB) Protein

Presented By: Helen Dobbelmann, John Beer

Supported By: Dr. Emma Feeney, Biology

The specific effects of individual amino acid mutations on the function of the resulting protein remain ambiguous. Over the course of the Spring 2024 semester, we investigated the effect of the V52F mutation on the expression, thermal stability, and catalytic efficiency of beta-glucosidase (BglB). We hypothesized that the mutant would demonstrate similar catalytic efficiency and thermal stability compared to the wild type - molecular modeling analysis suggests a high likelihood of expression and unchanged local intermolecular interactions.

◆ **Poster 22** ◆

Expression of mRNA of the col2a1b gene during Zebrafish Embryogenesis

Presented By: Faith Doy, Tyler Wallander, Angelina Carcione, Mansi Patel; Mulcahy Scholars Program

Supported By: Dr. Rodney Dale, Biology

Our research laboratory is interested in understanding the role of Type II alpha 1 collagen (col2a1) in vertebrate development. We are currently using the teleost vertebrae *Danio rerio*, the common Zebrafish to visualize the function of the Zebrafish *Col1a1* gene. The goal of our laboratory is to visualize and locate the expression of the type II alpha 1 collagen b gene (*col2a1b*) in zebrafish. Humans only have one version of the *col2a1* gene as opposed to the two homologs in zebrafish, *col2a1a* and *col2a1b*. The expression of *col2a1b* is limited in zebrafish to only the perichondrium, whereas its paralog *col2a1a* is expressed in both the perichondrium and the chondrocytes. In the future, our laboratory seeks to discover the mechanism of how the *col2a1b* gene maintains its expression in the perichondrium. We will be using the process of in situ hybridization to pinpoint the location of the *col2a1b* mRNA during different stages of embryonic zebrafish development.

◆ **Poster 23** ◆

Organic Acid Production in Bacterial Suspensions Containing MFP and NaF

Presented By: Ailynn Duarte, Priyanka Bhatt; Mulcahy Scholars Program

Supported By: Dr. Jeremy Ritzert, Biology; Dr. Conrad Naleway, Chemistry and Biochemistry

An important aspect of *S. mutans* cavity formation is the production of acids. When brushing with fluoridated toothpastes, mechanical disruption of the biofilms on the teeth physically removes cells from the oral cavity. Fluorides in the toothpastes can also prevent biofilm formation (reference). Fluorides can also inhibit acid production of remaining bacteria. However, the type of acids and the extent at which different types of fluoride, specifically MFP, inhibit acid production is unknown. Although fluoride is well known to strengthen enamel by reducing its solubility; we believe the bigger role is in altering the metabolism of the bacteria resulting in a diminished level of acid attack. I wish to measure acid production by *S. mutans* when exposed to different fluorides (NaF and MFP) by measuring changes in pH and quantify the levels of specific acids by Ion Chromatography (IC).

◆ **Poster 24** ◆

Hinduism in Chicago: A Religion of Asia Study

Presented By: David Duenas, Dominic Dao, Katie Kim, Melat Ross

Supported By: Dr. Yarina Liston, Theology

This presentation will describe the views and experiences of Hindu-practicing members of our Chicago community. More specifically, the lens will be through the experience of the presenters at BAPS Chicago, a traditional Hindu place of worship built by the BAPS Swaminarayan Swami. We will explore the chosen styles of architecture and how they have been influenced by Hinduism and Indian culture. Moreover, the views of the practitioners will walk us through the beliefs from the beginning of civilization, learn about the history and beauty of Hinduism, and truly understand Hinduism from facts, figures, and information.

◆ **Poster 25** ◆

Modeling the effects of shipping vessels on the distribution of wetlands within the St. Mary's River

Presented By: Spencer Dzyacky; Carbon Undergraduate Research Fellowship Program

Supported By: Shane Lishawa, School of Environmental Sustainability; Dr. Bo Zhang, School of Environmental Sustainability

The St. Marys River is the connecting channel between Lake Superior and Lake Huron causing it to be the site of heavy amounts of shipping traffic which results in large wakes that can crash into vulnerable riverside wetlands. During the summer of 2023, density data of two wave tolerant emergent plants were taken at different sites within the river. Using this data a random forest model was trained to predict the densities and presence/absence of emergent plants and showed a significant difference in plant density between sites unexposed and exposed to the channel.

◆ Poster 26 ◆

Zen Buddhist Temple of Chicago

Presented By: Meghan Economos

Supported By: Dr. Yarina Liston, Theology

I will be presenting on my trip to the Zen Buddhist Temple of Chicago. My presentation will include my findings in how Buddhism takes place in the modern age and in the city.

◆ Poster 27 ◆

The Near Horizon Geometry of a Black Hole

Presented By: Hope Elgart, Bennett Korotko

Supported By: Dr. Walter Tangarife, Physics

A Schwarzschild black hole is an idealization of the black holes we observe in nature, existing infinitely long in time and without rotation or charge. In our research, we have been examining the geometry of these black holes near their horizons, utilizing coordinate changes and quantum mechanics to determine the way these black holes process, or thermalize, incoming information.

◆ Poster 28 ◆

The Gay Dating Experience: Partner Selection and Self-Compassion in Short and Long-term Dating Application Behaviors

Presented By: Kristine Majal Enrile, Elena Clim; Provost Fellowship

Supported By: Dr. Tracey DeHart, Psychology

The purpose of this study will be to examine the effects of self-compassion and relationship orientation, long-term oriented and short-term (or “Hook-Up”) oriented, and its influence on mate selection via dating app related behavior in the Queer male community. Through manipulating a self-compassion task, we will be studying the effects of self-compassion on participant response via rating confidence to pursue a presented mate through the lenses of short-term and long-term relationship orientations. With this, we expect this study to provide insight into the relationship between the perceived self and the influence of personal compassion on the selection of mates and their inherent body image in the virtual dating environment. We expect those with high self-compassion to have a more body-positive and open mindset which will then provide more consistent ratings between both the long-term and short-term oriented lenses. For those with low self-compassion, we expect to see lower ratings of potential mates within the short-term lens, but consistency in ratings to that of their high self-compassion counterparts within the long-term orientation lens.

◆ Poster 29 ◆

Measuring Compost Contamination in Engrained Café

Presented By: Sofia Farias, Ciara Evans, Madi Gordon

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

This presentation will describe the experience of conducting a waste audit in Engrained Café. Engrained Café is the only space on Loyola’s Lakeshore campus where composting is in the students’ hands. Though a sustainable initiative, this compost is contaminated with items that should be disposed of in recycling or landfill bins. Our 3-person team conducted a waste audit to observe the specific contaminants and create a data source for future projects to improve the student composting system. Our results can inform the design of educational and outreach strategies for effective composting.

◆ Poster 30 ◆

Presence of Prophages in Enterococcus faecalis Isolated from the Female Urinary Tract

Presented By: Grace Finger; Mulcahy Scholars Program

Supported By: Dr. Catherine Putonti, Biology; Sandra Jablonska, Biology

Enterococcus faecalis is commonly found in the gastrointestinal tract and the environment, e.g., soil and water. It is an opportunistic pathogen, associated with recurrent urinary tract infections (rUTI) and endocarditis, an infection of the heart. To date, two investigations of *E. faecalis* genomes from the urogenital, gastrointestinal tract, and blood have been conducted. Both identified “genetic signatures” that can distinguish these genomes by their isolation site. Of note is the presence of prophage sequences unique to strains isolated from female urine samples. Prophages are bacteriophages (viruses that infect bacteria) that have integrated their genomes into their bacterial host’s genome and replicate with the bacteria through its lysogenic life cycle. Both prior studies identified these prophages (including some of the same prophages) from strains isolated from post-menopausal females; it is unknown if these prophages are found within *E. faecalis* strains of the urinary tract of pre-menopausal females. To address these gaps in knowledge, we isolated 18 *E. faecalis* samples from voided urine samples of healthy females aged 18-25 as a part of an IRB-approved study. Whole genome sequencing was performed, and genomes were annotated to identify prophage sequences. Furthermore, the tool Anvi’o was used to compare the genomes of strains from pre-menopausal and post-menopausal females. Further studies are needed to explore putative role of these prophages in *E. faecalis* adaptation to the female urinary tract.

◆ Poster 31 ◆

Female Genital Mutilation and Access to Secondary Education in Ethiopia

Presented By: Malak Fisseha, Aman Kothadia, Kely Ann dela Cruz

Supported By: Dr. Tara Casebolt, Health Sciences and Public Health

This presentation will describe the associations between young girls' access to secondary education and the rate of female genital mutilation in Ethiopia. We hypothesize that there is a positive association between low literacy and secondary education rates in women and high rates of female circumcision. Throughout the semester, we examined variables in a given dataset and explored the literature on the topic to solidify our findings and test our hypothesis. Through this capstone experience, we were able to further understand research methods in public health.

◆ Poster 32 ◆

Drosophila Phosphoducin-like Protein 3 Regulates Spermatogenesis

Presented By: Grace Flemming; Mulcahy Scholars Program

Supported By: Dr. Jennifer Mierisch, Biology

CG4511 encodes the *Drosophila* homolog of Phosphoducin-like Protein 3 (Phlp3), which is hypothesized to function as a regulator of spermatogenesis. Males homozygous for a P-element insertion in the 5’-UTR of Phlp3 display reduced gene expression, sterility, and a failure for sperm to mature past the canoe stage. Microtubule rich dense complexes (DCs), which function as a scaffold for nuclear shaping, are reduced in size in Phlp3 mutants, suggesting that Phlp3 may function via regulation of the cytoskeleton to promote nuclear elongation. We are currently using transmission electron microscopy to explore the dynamics of the microtubules in the DC during spermiogenesis.

◆ Poster 33 ◆

Social Media & EdTech

Presented By: Logan Foster, Cate Reisinger, Michael Spine, Kate Pinsel, Gabriella Olshansky, Teddy Carlton, Shreya Konanur
Supported By: Dr. Stacy Neier Beran, Business

This research project delves into the positive aspects of social media to enhance educational technology (Ed Tech) for students. Through analysis of current practices and trends, including surveys, interviews, and Mintel, the study aims to identify effective strategies for integrating social media into Ed Tech solutions. The research seeks to provide insights and recommendations to enrich students' educational experiences.

◆ **Poster 34** ◆

Characterization of the enzymatic activity and thermostability of the BglB (Y118) mutant protein relative to the wild type.

Presented By: Abigail Fruzyna, Miranda Chaidez

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

We hypothesize the beta-glucosidase mutant Y118F will demonstrate increased catalytic efficiency in comparison to the wild type because its overall Foldit score suggests a high likelihood of expression and intermolecular analysis led to an increased amount of Hydrogen bonding adjacent to the mutation site. Furthermore, previously published data on our mutant (Y118F) further supports this hypothesis.

◆ **Poster 35** ◆

Do Individual Differences Impact whether a Child Learns from Seeing or Doing Gesture?

Presented By: Lisa Gallo; Mulcahy Scholars Program

Supported By: Dr. Elizabeth Wakefield, Psychology

Gestures are hand movements that accompany speech and convey information. We know that gesture can help children learn. What we don't know is how individual differences affect the efficacy of gesture. In the proposed study, I will address two questions: (1) how does an individual's VSWM capacity and fluid intelligence impact whether they will benefit from gesture instruction? (2) does the impact of these individual differences depend on whether a learner is observing or producing gesture? I will do this by measuring these individual differences and seeing how they impact children's ability to benefit from gesture instruction on a mathematical measurement task. I anticipate that these individual differences will contribute to how effective gesture is, both on their own and in combination.

◆ **Poster 36** ◆

AI in Single Player Games: Player Insights

Presented By: Brandon Schneider, Michael Garcia, Kyle Fish, Sanyam Shah, Osvaldo Espino, Francisco Perez, Brandon Schnieder, Mario Blum

Supported By: Dr. Stacy Neier Beran, Business

This research project delves into the intricate relationship between attitudes towards artificial intelligence (AI) integration and the single player gaming experience. As AI technology becomes increasingly prevalent in the gaming industry, understanding how players perceive and interact with AI-driven elements is paramount for game developers aiming to create immersive and engaging experiences. This study employs a mixed-methods approach, combining quantitative surveys and qualitative interviews, to investigate the multifaceted dimensions of attitudes towards AI integration and their influence on the gaming experience. Through comprehensive data analysis, including statistical modeling and coding for insights, the research aims to uncover patterns, correlations, and

underlying factors shaping players' attitudes towards AI integration in single player games. The findings from this study not only contribute to the industrial understanding of player psychology and human-computer interaction but also provide actionable insights for game designers seeking to optimize AI integration to enhance single player gaming experiences.

◆ Poster 37 ◆

Gene Annotation of lin-28 in Drosophila serrata

Presented By: Juanita Garcia

Supported By: Dr. Jennifer Mierisch, Biology

Examining gene conservation across various species is a key approach for exploring the molecular evolution of signaling pathways involved in vital cellular processes. The main objective of this project is to examine the structural conservation of the gene *lin-28* in the insulin signaling pathway, an important metabolic pathway, across *Drosophila* species to learn how quickly this pathway is evolving. Existing evidence suggests molecules acting earlier in the insulin signaling pathway evolve more quickly than molecules acting later (Alvarez-Ponce et al., 2022). *Drosophila serrata*, the species investigated in this annotation is within the melanogaster group, more precisely in the montium subgroup which diverged from the melanogaster group about 15 million years ago. Within the montium clade, evolutionary distances are such that large numbers of sequences can be accurately aligned while recovering strong signals of divergence; and the distance between the montium group and *D. melanogaster* is short enough so that orthologous sequences can be readily identified (Bronski et al., 2020). Given that *D. melanogaster* possesses a well annotated genome, it serves as a good reference for gene annotations across *Drosophila* species. Using the UCSC Genome Browser, BLAST, and synteny to *Drosophila melanogaster*, we mapped the location of *lin-28* in *D. serrata* and annotated its coding exons. Our annotation showed quite a few remarkable things such as instances of divergence and lack of conservation at the beginning and ending of the *lin-28* coding sequence. *lin-28* functions and is highly enriched in adult intestinal stem cells in the *Drosophila* intestine. It is a stem cell intrinsic factor that boosts insulin signaling in intestinal progenitor cells and promotes their symmetric division in response to nutrients. *lin-28* controls the adult stem cell division patterns that underlie tissue homeostasis and regeneration. The function of *lin-28* relates to the insulin signaling pathway in that it helps boost insulin signaling in intestinal progenitor cells and promoting their symmetric division in response to nutrients (Chen et al., 2015). This project will contribute to analysis of molecular evolution of insulin signaling pathway genes across *Drosophila* species by the Genomics Education Partnership.

◆ Poster 38 ◆

Characterization of R76T mutant B-glucosidase enzyme expressed in E. coli transformed with a plasmid containing the R76T BglB mutant gene

Presented By: Luis Garcia, Jose Flores Valor

Supported By: Dr. Emma Feeney, Biology

β -glucosidase (BglB) mutant R76T will show a decrease in catalytic activity (Kcat/Km) compared to the wild type enzyme because the mutation results in the loss of two hydrogen bonds near the enzyme's active site. For this reason, I expect that the thermal stability (Tm) of the mutant enzyme will also decrease. Moreover, the overall Foldit score of the mutant enzyme suggests it is less stable than the wild type enzyme, which would lead to a lower thermal stability.

◆ Poster 39 ◆

Examining the Genetic Basis of Medicago truncatula and Ensifer meliloti Mutualism: Is Partner Choice Adaptive?

Presented By: Azucena Gomez, Katarina Alvarado; Mulcahy Scholars Program

Supported By: Dr. Michael Grillo, Biology; Dr. Andres Gutierrez Viveros, Biology

The interaction between *Medicago truncatula* and *Ensifer meliloti* allows us to understand legume-rhizobium mutualism better. Then to apply this knowledge, using GWAS, to gain a larger understanding of the Fabaceae family and rhizobium symbiosis. This is a multi-year project, one started by previous researchers who collected and analyzed data on partner quality through single-strand inoculation. The current project of partner choice with multi-strain inoculation led to the collection and extraction of about 5,000 samples. Posing the question of if *M. truncatula* can execute partner choice and if *M. truncatula* is also able to determine the better strain of *E. meliloti* with the phenotypic data collected. In a preliminary analysis, 38 plants demonstrated a significant partner choice, but little data found that *M. truncatula* can determine the phenotypically best-fit rhizobium strain.

◆ **Poster 40** ◆

Cook County Community Survey: Gender and Restorative Justice

Presented By: Madeline Grace; The Carroll and Adelaide Johnson Scholarship

Supported By: Dr. David Doherty, Political Science

This presentation will look at the results of the CCCS, and what they say about the connections between gender and public opinion on restorative justice practices. In particular, it will look at how opinions about restorative justice practices may vary based on the gender of the respondent and the gender of the perpetrator. During the Fall 2023 semester, I worked with my advisor to craft questions on these issues for the CCCS, which was fielded this January. Through this experience, I was able to deepen my knowledge of a variety of factors that may influence broader opinions about criminal issues.

◆ **Poster 41** ◆

Fashion in the Business World

Presented By: Goda Grigaliunas

This presentation will take a deep dive into my internship at NICZKA, a luxury fashion company. During my internship here I helped the owner rebrand her entire company. Starting by transforming her alterations company into a clothing line and ending with closing up her shop and moving her business online. During my internship I learned how to market, manage, create clothing and plan events like fashion shows.

◆ **Poster 42** ◆

The Effects of a Low or High Fat Diet That Determines the Outcome of Diabetes

Presented By: Tiara Guider

Supported By: Dr. James Cheverud, Biology

For my research, I examined the effects of a low and high fat on mice of both sexes, male and female, to determine if the type of diet that is consumed is reflected in rather or not the mice is prone to have diabetes or not. It is important to talk about because type 2 diabetes is one of the leading chronic diseases in the United States. My hypothesis was that the additives of different sugars or the overall increase in fat and sugars in the American diet has led to the increase of diabetes.

◆ **Poster 43** ◆

The Mutation of the Residue Serine 63 to Alanine in ADP-Glucose Pyrophosphatase from Anabaena PCC 7120

Presented By: Linuki Gunasekara; Mulcahy Scholars Program

Supported By: Dr. Miguel A. Ballicora, Chemistry and Biochemistry; Gabriela Martinez-Ramirez, Chemistry and Biochemistry

ADP-Glucose Pyrophosphatase (ADP-Glc PPase) is the regulatory enzyme of starch in plants and glycogen in bacteria. Starch is a polysaccharide is used in the making of biodegradable products and biofuels. Here I studied a conserved serine residue in the cyanobacterium ADP-Glc PPase from *Anabaena* PCC 7120. To study its role in the enzyme we mutated it to alanine, and we tested the behavior of the enzyme in presence of its activators, Fru6P, Glc6P, and Man6P. Studying the regulation of the enzyme can teach us about its evolution and its function and structural relationship with other ADP-Glc PPases from other species.

◆ **Poster 44** ◆

Chromatic Adaptation in the Red Algae *Galdieria sulphuraria*

Presented By: Vidya Gundlapalli, Evan Smolen

Supported By: Dr. Colin Gates, 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 that in cyanobacteria, we placed liquid cultures under red and blue light in brightly lit, 30°C environments. This was done to measure culture growth and photosynthetic health under the different wavelengths of light. By completing these experiments and then analyzing data collected via spectrophotometry and fluorometry, we will be able to further the study of light absorption and photosynthetic characterization of *Galdieria sulphuraria*.

◆ **Poster 45** ◆

The impact of generative AI on student's educational experiences

Presented By: Paige Gutierrez, Dom Mott, Riley Viehland, Olivia Lovett, Kaylee

Aguirre, Effie Sfikas, Sarah Rupani

Supported By: Dr. Stacy Neier Beran, Business

In an era defined by rapid technological advancements, one of the most transformative forces shaping the landscape of education. As classrooms evolve and traditional teaching methods undergo a digital revolution, educators, students, and parents find themselves at the intersection of innovation and pedagogy. Many academic institutions are wondering how generative AI is affecting the learning environment. Through the use of qualitative and quantitative data, Squad Lux Clippies evaluates the effect of how generative AI affects students' educational experiences.

◆ **Poster 46** ◆

Investment Pitch for Ralph Lauren

Presented By: Lilly Halliday

Supported By: Dr. Stephen Todd, Business

This presentation will use research to thoroughly analyze a publicly traded company using a variety of metrics. The stock that I will be presenting is Ralph Lauren. This presentation will help to understand their business model and how they perform in their given industry. It will also use financial valuation models and analysis to gauge how their stock is valued. It will dive into a business overview that includes management and corporate governance practices. It will also include an industry analysis of Ralph Lauren's industry overview and competitive positioning in the industry. Further, it will include financial analysis and valuation methods to analyze how the stock is being valued and if it is a good buy for shareholders. It will also go over risks and other components necessary to fully understand Ralph Lauren.

◆ **Poster 47** ◆

Harnessing Sequenced Stimulation and Commands for Mapping Somatosensory and Motor Imagery

Presented By: Waralyz Hernandez, Lauren Manusos, Andreea Cionca; Mulcahy Scholars Program

Supported By: Dr. Vincent Chen, Engineering

Utilizing sequenced stimulation and commands, we investigated the complex mapping of somatosensory and motor imageries. Our approach aimed to elucidate pathways in the brain, revealing insights into the representation of sensory and motor functions. Through systematic stimulation of the peripheral nervous system and repetition of verbal or visual commands, we sought to refine the somatosensory and motor imagery map, offering deeper insights into brain functions. This exploration not only advances our understanding of the brain's intricacies but also has potential applications in diverse fields including neuroscience, rehabilitation, and prosthetics.

◆ Poster 48 ◆

Purification and Analysis of B-Glucosidase Mutant H223A to better Understand how Catalytic Efficiency and Enzymatic Activity is affected

Presented By: Teresa Herring, Madison Payleitner

This experiment will analyze the mutant H223A of the B-Glucosidase B protein (BglB). BglB aids cellulase in breaking down cellulose and other (B1 □4)- linked sugars, which are in cells in our body. This was accomplished by isolating and purifying and then characterizing our protein. These steps were performed to be able to analyze how the catalytic efficiency and enzymatic activity is affected. We hypothesize based on FoldIt results that the expression of this mutation is likely and relatively stable. Through this experiment, we were able to better understand how these factors were affected.

◆ Poster 49 ◆

Organic Acid Production in Bacterial Suspensions Containing NaF and MFP

Presented By: Elena Hoppmann, Ailynn Duarte, Victoria Nolte, Priyanka Bhatt; Mulcahy Scholars Program

Supported By: Dr. Conrad Naleway, Chemistry and Biochemistry; Dr. Jeremy Ritzert, Biology

Monofluorophosphate (MFP) and sodium fluoride (NaF) are clinically proven to be anticaries agents. Both compounds are widely used, yet they are employed differently. MFP is self-sufficient, whereas the effectiveness of NaF differs based on the presence various toothpaste binding agents.

Standardized regulations attempt to stipulate its inclusion to ensure that it does not react with the toothpaste itself. MFP is suggested to possibly work better than NaF at higher pH values, whereas NaF is said to work better at lower pH values since HF is known to be more efficient in penetrating the cell membrane. The bacterial strain that will be used is *S. mutans*, as that is the bacteria commonly in a mouth environment and known to be a causal factor in the production of lactic acid that dissolves the enamel. Bacteria will grow in BHI (brain heart infusion) and LAPTG, a growth media, and will then be harvested and washed. Cells will then be suspended in an artificial saliva phosphate buffer with sodium salts, and then separated into triplicate beakers for control, NaF and MFP. Subsequently, a pH drop will run over the course of 2 hours to see which treatment inhibits acid production more effectively at a higher pH in a hypothetical mouth environment. The project will address the key questions surrounding the mechanistic differences and response between NaF and MFP, which are as follows:

- 1) Is MFP more effective than NaF at inhibiting lactic acid production at higher pH?
- 2) What is the difference in response between the two mechanisms (NaF does not enter the cell whereas MFP does)?
- 3) What are the levels of cellular penetration of the active agents into the bacteria by performing F-19 NMR studies.

◆ Poster 50 ◆

Assessing thermostability and catalytic efficiency of BglB P41L to generate a dataset for the Design to Data (D2D) project

Presented By: Zunaira Hussaini, Sophia Moore

Supported By: Dr. Emma Feeney, Biology

β -glucosidase B (BglB) is a monomeric protein that is used in the production of energy through the process of bioconversion. We hypothesize that BglB mutant P41L will demonstrate an increased catalytic efficiency in comparison to the wild type because its overall Foldit score of -1086.774 suggests a high likelihood of expression as it is similar to the original Foldit score of -1089.697, and intermolecular modeling analysis also points to decreased local interactions as the clashing score decreased from the original 0.648 to 0.226. Furthermore, previously published data on similar mutations F37N and G46C support this hypothesis of an increased catalytic efficiency.

◆ **Poster 51** ◆

Goal Preference and Intended Response to Workplace Sexism

Presented By: Libby Gits; Provost Fellowship

Supported By: Emily Budde, Psychology; Dr. Robyn Mallett, Psychology

This presentation outlines my research on the relationship between a target's goals and intended response to workplace sexism. I examined the influence of goals on response intentions in an online CloudResearch survey (n = 262). Female participants imagined they experienced sexism in an interview and responded with their goals and behavioral intentions to the scenario. As predicted, the self-protection goal increased intentions to avoid, the liking goal increased intentions to repair, and the respect goal increased intentions to confront. Investigations like mine can help researchers and policymakers better understand what motivates non-confrontational responses to sexism and validate the experiences of targets.

◆ **Poster 52** ◆

EphrinA's repel embryonic gustatory geniculate axons in vitro and in vivo and are expressed in the adult gustatory system

Presented By: Rohan Jaiswal, Anna Grundhoefer; Carbon Undergraduate Research Fellowship Program

Supported By: Dr. M. William Rochlin, Biology

Ephs and ephrins are cell surface proteins that act as ligands and receptors for one another and typically mediate contact-dependent axon repulsion. We explored whether there is a role for this signaling system in the rodent tongue. We examined expression patterns of EphAs and ephrinAs in the tongue and geniculate ganglion, in-vitro responses of neurites to ephrinAs, and in-vivo knockouts of ephrinA1, -A3, and -A4. Together, these data support a role for EphA-ephrinA signaling in axon targeting in the embryonic rodent tongue. Preliminary data shows that EphAs and ephrinAs are expressed in the adult rodent gustatory system as well.

◆ **Poster 53** ◆

Sysco Corp

Presented By: Abigail Jordan

Supported By: Dr. Stephen Todd, Business

This presentation will give an in depth analysis of the stock of Sysco Corporation. Over the course of the 2024 Spring Semester, our class each had to deliver a stock pitch and our recommended decision with it. Through this experience, we were able to expand our knowledge on investments and the process that goes into a good investment.

◆ **Poster 54** ◆

ActionPoint: An App to Combat Cyberbullying by Strengthening Parent-Teen Relationships

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Presented By: Madison Juarez

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

Due to the increased prevalence of cyberbullying and the detrimental impact it can have on adolescents, there is a critical need for tools to help combat cyberbullying. This poster introduces the ActionPoint app, a mobile application based on empirical findings highlighting the importance of strong parent-teen relationships for reducing cyberbullying risk. The app is designed to help families build stronger communication skills, set healthy boundaries for social media use, identify instances of cyberbullying and a teen's cyberbullying risk, and, ultimately, decrease the negative outcomes of cyberbullying. The app guides parents and teens through a series of interactive modules that engage them in evidence-based activities that promote better understanding of cyberbullying risks and healthy online behaviors. In this poster, we describe the app design, the psychology research supporting the design of each module, the architecture and implementation details, and crucial paths to extend the app.

◆ Poster 55 ◆

The role of Trc in glial development in the eye-imaginal disc

Presented By: Julia Kaniuk; Biology Research Fellows Program

Supported By: Dr. Jennifer Mierisch, Biology

In neurons, Trc has been demonstrated to cooperate with the Raw protein which functions to regulate glial development in the eye-imaginal disc, leading us to ask if Trc may also have a role in glial development. *trc* was knocked down in all glia, resulting in a decrease in glia in the eye disc. To determine if the decrease in glia is caused by defective glial migration, proliferation, or death, immunostaining was used. Preliminary data suggests reduced glial proliferation may be the reason, therefore Trc could be an important regulator of glial development in the eye imaginal disc.

◆ Poster 56 ◆

Deciphering the Therapeutic Prospects of Small Compound AA147 in Multiple Sclerosis

Presented By: Kevin Kaschke

Supported By: Dr. Yanan Chen, Biology; Dr. Brian Popko, Northwestern University

Current immunomodulatory therapies for multiple sclerosis (MS) have limited benefit. Oligodendrocyte (OL) death and demyelination induced by inflammatory attack and subsequent axonal degeneration are key features of MS. Inflammation-induced endoplasmic reticulum (ER) stress are thought to promote tissue damage in MS. ER stress can trigger the innate cytoprotective response, unfolded protein response (UPR), which is orchestrated by three transmembrane signal transducers: inositol requiring enzyme 1 (IRE1), activating transcription factor 6 (ATF6), and pancreatic ER kinase (PERK). Although the ATF6 arm is not as well characterized, a recent study showed that ATF6 deficiency exacerbated EAE severity and oligodendrocyte loss, indicating its important role in protecting oligodendrocytes from inflammation. AA147, a newly discovered small compound, has been shown to activate the ATF6 pathway through reducing disulfides and enhancing trafficking to Golgi and then nucleus. AA147 has recently been shown to provide protection against ischemia/reperfusion damage to various tissues, including the brain. Unexpectedly, AA147 might activate the antioxidative nuclear factor erythroid 2-related factor 2 (NRF2) pathway in certain cell types through covalent modifying Kelch-like ECH-associated protein 1 (Keap1). NRF2 pathway is known to both maintain intracellular redox homeostasis and mediate anti-inflammatory responses. The purpose of this study is to explore the therapeutic potential of AA147 and its underlying mechanism in a MS mouse model, experimental autoimmune encephalitis (EAE). The subcellular location of ATF6 and NRF2 were observed by immunocytochemistry. EAE was induced in female WT mice and OL-specific conditional knockout of ATF6 mice by immunization with myelin antigen. Mice were scored and treated daily with AA147 from day 7. Histological analysis, including RNAscope, was performed on the lumbar spinal cords collected at day 15. Splenocytes and CNS cells were characterized by flow cytometry. AA147 asserts a significant reduction on disease severity in chronic EAE. The protection might be attributed to augmenting the cytoprotective UPR in OLs through the ATF6 pathway and inducing anti-inflammatory microglial response via the NRF2 pathway.

◆ Poster 57 ◆

Transforming Consumer Learning: Exploring the Impact of AI Implementation on Educational Experiences.

Presented By: Franklin Koch, Harsh Patel, AJ Carroll, Bella Callejas Holton, Katelyn Schmitz, Noah Jonasz, Ava Alexander

Supported By: Dr. Stacy Neier Beran, Business

The project aims to assess the potential of current AI technology to enhance educational technology (edtech) platforms and address consumer demands. Through a multifaceted approach, the study will investigate various dimensions of edtech utilization and consumer preferences. Firstly, the efficacy of AI integration in existing educational platforms will be evaluated, examining its impact on user engagement, personalization, and learning outcomes. Additionally, different edtech platforms will be analyzed to identify target consumer demographics and discern emerging trends in AI-driven educational solutions. Furthermore, the significance of online education in the current educational landscape will be explored, examining its accessibility, scalability, and effectiveness. Consumer demands that remain unmet by current edtech offerings will also be identified, aiming to bridge the gap between user expectations and existing technological capabilities. By synthesizing insights from these research objectives, the project seeks to inform the development of AI-enhanced educational technologies that cater to diverse consumer needs and preferences, ultimately enhancing the accessibility and effectiveness of online learning experiences.

◆ Poster 58 ◆

Recombinant Expression and Purification of the Subpellicular Membrane Protein-1 of the Malaria Parasite Plasmodium.

Presented By: Ann Koshy; Mulcahy Scholars Program

Supported By: Dr. Stefan Kanzok, Biology

The malaria parasite Plasmodium undergoes drastic morphological changes that allow it to survive in both humans and its mosquito host. These morphology changes are possible due to its microtubule organization and its associated proteins. My project focuses on SPM-1 (Subpellicular Microtubule Protein-1) which is present inside the lumen of microtubules supporting the plasma membrane of the parasite. We hypothesize that SPM-1 is expressed and will co-localize with other microtubule associated proteins (MAPS). To identify this first a recombinant expression and purification of the protein is done before antibodies can be generated against them for further immunofluorescence studies.

◆ Poster 59 ◆

Infrastructural Violence and Women's Health in Northern Peru

Presented By: Aman Kothadia; John Grant Fellowship for Research in Bioethics

Supported By: Dr. Paula Skye Tallman, Anthropology

Evidence suggests that communities lacking access to water and water-related resources see increased health disparities due to structural and environmental factors. In this poster, we contend that a lack of water resources acts as a form of “infrastructural violence” that impacts the lives of women. Specifically, we draw from a broader research project on water insecurity and gender-based violence conducted in Peru from 2021-2022 to highlight the differential experiences of women living in two communities, one with water infrastructure and one without it. We conclude that infrastructural and societal inequities pose a significant health risk to women in water-insecure regions.

◆ Poster 60 ◆

Optimization of a Carbon Dioxide Snow Cleaning Method for NASA Solar Wind Samples

Presented By: Andrew Kramer, Sam Jezuit, Morgan Frilot; Provost Fellowship

Supported By: Dr. Martina Schmeling, Chemistry and Biochemistry

The NASA Genesis Lab was tasked with developing an efficient method to clean NASA Genesis solar wind wafer samples utilizing a CO₂ snow apparatus. Parameters, such as the angle of impact, the distance of the nozzle from the sample, and the duration of treatment, were tested. The most effective technique for handling the CO₂ snow apparatus was obtained testing various repetitive motions. Finally, various contaminants with differing chemical properties were also tested to determine the effectiveness of CO₂ snow treatment. From there, mock silicon wafers were contaminated and cleaned with the developed method and analyzed with grazing incidence x-ray fluorescence.

◆ Poster 61 ◆

Synthesis of Three Novel Inorganic Series Coordinated to a Carbazole-Based Tridentate Pincer Ligand

Presented By: Diana Lambropoulos; Mulcahy Scholars Program; Provost Fellowship

Supported By: Bailey Jo Hanson, Chemistry and Biochemistry; Dr. Weu-Tsung Lee, Chemistry and Biochemistry

Transition metals are found in countless industrial and biological applications around the world; however, their behavior is challenging to understand when associated with ligands in complex processes. We sought to synthesize an inventory of novel inorganic complexes to observe the effects of varying ligating halogens (CztBu(PyziPr)NiX, X= Br, Cl, or I), steric bulk ((CztBu(PyzR))₂Fe]PF₆, R= H, Me, or iPr), and the identity of the transition metal ((CztBu(PyzH))₂M, M= Co, Ni, Zn). Probing these effects allows for the expansion of our understanding of transition metal behavior and provides avenues to explore potential catalytic capabilities in each series.

◆ Poster 62 ◆

Understanding the Thermodynamics of Antibody Maturation

Presented By: Alexander Le; Mulcahy Scholars Program

Supported By: Dr. Joerg Zimmermann, Chemistry and Biochemistry

In vivo, antibodies undergo Somatic Hypermutation which alters the effectiveness and specificity of the binding for antibodies. Understanding how antibodies change will allow for new therapies to be created. The hypothesis is that in vivo, when antibodies get a mutation there is synergy with that mutation that will cause another mutation that will aid in the efficiency of the antibody. Catalytic antibodies and a compound called MHDL were used to test the hypothesis and efficiency, measured by the fluorescence change. The results from this project do not answer the hypothesis as the research project is unfinished.

◆ Poster 63 ◆

An Antimicrobial Exposure under Environmental Conditions Select for Resistant Mutants

Presented By: Mattias Lenz; Mulcahy Scholars Program

Supported By: Dr. John Kelly, Biology

Triclosan is a widely used antimicrobial compound found in many consumer products that has been detected as a contaminant in human-impacted rivers and streams. Exposure to triclosan in the lab can select for resistant bacterial strains, which could reduce the effectiveness of this compound. The goal

of my project is to develop a molecular method to detect triclosan resistant mutants in environments that have been exposed to triclosan. We designed and tested a set of PCR primers that target the *fabI* gene, which is linked to triclosan resistance, that we can use to sequence *fabI* genes from environmental samples.

◆ **Poster 64** ◆

Assessing the Impact of Video Options on Comprehension, Perception, and Effort Using Biometrics

Presented By: Ayla Lezic, Bilal Khurshid, Kaitlin Walker, Eoin McDonagh

Supported By: Dr. Dinko Bačić, Business

We aim to determine how multitasking in the form of reading subtitles while consuming content affects emotional and analytical comprehension, perception, and mental effort. With the rise of streaming platforms, content is easily accessible in many languages with or without subtitles. While older viewers report subtitles are distracting and require more concentration, younger viewers, being avid social media users who are used to dual-tasking, are more accepting of subtitles. Eye-tracking, facial expression analysis, and galvanic skin response combined with survey questions will explore several research questions regarding viewing TV show clips in with or without subtitles and in various languages.

◆ **Poster 65** ◆

Cars and Cosmetics: A Gen-Z perspective on gender roles in corporate leadership positions

Presented By: Sophie Maday, Sophia Schultz, Cheka Bauldry, Katie Keith

Supported By: Dr. Katherine Alexander, Business

Our research seeks to answer the question of how the representation of women in Fortune 500 company C-suites influences the unconscious bias and stereotyping of Gen-Z university students. We hypothesize that the gender composition of Fortune 500 C-suits will influence the unconscious bias and stereotyping within the Gen-Z population. Furthermore, we anticipate that gender conformity and adherence to gender role theory will be significant factors in shaping these perceptions. We plan to conduct two simultaneous surveys among university students to analyze unconscious gender-industry-power bias. Survey 1 will focus on the perceptions of men and women in CEO roles, whereas Survey 2 will focus on the perceptions of men and women executives in various industries. Within both surveys, we will include demographic questions such as age, field of study, upbringing (urban/rural/suburban), home state, etc. We plan to present 2 profiles and ask participants to guess the gender associated with each profile. We plan to gather information on women in CEO positions, including age, tenure, education, and industry. Additionally, we will use this data to explore correlations between gender stereotyping and real-world representation. These may include the CEO industry, population age, population area of study, population home state, and population home type. Our study aims to raise awareness of how future leaders may be influenced by or perpetuate biases surrounding women in power. By identifying potential moderators and understanding the role of gender conformity and gender role theory, we hope to contribute valuable insights into the complex dynamics of gender stereotyping among the Gen-Z population.

◆ **Poster 66** ◆

Characterization and expression of the Y118F mutation of the B-glucosidase protein.

Presented By: Kristina Martinet, Wardah Shabbir

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

BglB mutant Y118F will demonstrate decreased catalytic efficiency in comparison to the wild type because the mutation converts an amino acid with the ability to form hydrogen bonds to one that cannot and the foldit score also points to decreased local interactions, along with the loss of a hydrogen bond.

◆ Poster 67 ◆

Conservation Leadership Center Rainwater Capture and Reuse

Presented By: Sydney Marz, Hewane Melkie, Katrina Ziemniak

Supported By: Dr. Maryam Amouamouha, Engineering; Dr. Gail Baura, Engineering; Dr. Jason Streeter, Engineering; Dr. Thomas Johnson, Engineerin; John Kanzia, Brookfield Zoo; David Benhart, Brookfield Zoo; Cory Wilcox, Brookfield Zoo; Dr. Tom Meehan, Brookfield Zoo; Dave Derk, Brookfield Zoo; John Martinez, Brookfield Zoo; Melissa Lewkovich, Brookfield Zoo; Dr. Matt Allender, Brookfield Zoo

Brookfield Zoo Chicago is advancing its sustainability practices by limiting its reliance on municipal water. Rainwater runoff from a nearby building's roof must be filtered of heavy metal contaminants and disinfected before it can be reused for irrigation of a turtle habitat. The system design includes a recirculation process that draws water from the 200-gallon cistern through a microfilter and UV sterilizer before reintroducing it to the cistern. The design abstains from using chemicals to treat the water. The main objective of this design is to collect, recover, and store rainwater at a quality sustainable to ambient freshwater aquatic life.

◆ Poster 68 ◆

Constitutional Protection of Indigenous Political Rights in Guatemala, Colombia and Bolivia

Presented By: Michael Mathews; RUDIS Fellowship Program

Supported By: Dr. Patrick Cunha Silva, Political Science

I analyze how Bolivia, Colombia, and Guatemala's constitutions provide protection and chances of representation for indigenous people. To do it, I study the constitutional and the resulting political and social aftermath of constitutional ratification. I propose an integrational study analyzing the political histories, the constitution, and their ramifications. I take a qualitative approach to constitutional analysis. In doing so, I analyze constitutions, treaties, and academic literature to examine what factors affect constitutional developments and the consequences of those changes for indigenous politics by analyzing specific phrasing of constitutions and how differences in wording can lead to drastically different effects.

◆ Poster 69 ◆

Studying the Optical Emission of Lightning Associated with Terrestrial gamma ray flashes at the Telescope Array Detector

Presented By: Davide Mazzucco; Mulcahy Scholars Program

Supported By: Dr. Rasha Abbasi, Physics; Dr. Ny Kiey, Physics

Terrestrial gamma ray flashes (TGF) are emissions of gamma rays in the earth's atmosphere during thunderstorms. In this investigation, we delve into the optical emissions of lightning linked with TGF's. The TGF's are observed by the Telescope Array Surface Detector (TASD) in conjunction with lightning detectors including an INTF, a fast antenna, high-speed camera, and a slitless spectroscopic system. This study will also present preliminary findings from a photometer array, installed at the site in 2023, that provides a higher timing resolution, offering insights into optical emissions from atmospheric electrical discharge processes in the ultraviolet and infrared spectra.

◆ Poster 70 ◆

Characterization of the B-Glucosidase (BglB) mutant A80S to examine the mutation's effect on the enzyme's thermostability and catalytic efficiency

Presented By: Emma McIntosh, Dylan TenBroeck

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

We hypothesize that β -glucosidase (BglB) mutant A80S will demonstrate the same catalytic efficiency (kcat/KM) in comparison to the wild type because its overall Foldit score suggests some likelihood of expression, and intermolecular modeling analysis (local score) points to increased stability of the enzyme due to increased local interactions in the form of two new hydrogen bonds with amino acids Tyrosine and Arginine at positions 99 and 83. Furthermore, previously published BglB Variant Characterization data in the D2D database on the A80S mutation indicates no change in the enzyme's catalytic efficiency, thus supporting this hypothesis.

◆ **Poster 71** ◆

Expression and Activity of BglB with mutation V52F in BL21(De3) in E. Coli

Presented By: Samantha Morey, Liset Perez

Supported By: Dr. Emma Feeney, Biology

β -glucosidase (BglB) mutant V52F will demonstrate the same catalytic efficiency (kcat/KM) and/or thermal stability (T_m) in comparison to the wild type. Previously published data on similar mutations V52A, V52D, and V52G support this hypothesis.

◆ **Poster 72** ◆

Growing Resilience: Combating Food Insecurity through Urban Farming in Bronzeville

Presented By: Olivia Muth, Jera Moses, Andrew Lane, Brandon Folsom

Supported By: Kevin Erickson, Urban Agriculture; Rosalyn Owens, Bronzeville Neighborhood Farm

Bronzeville Neighborhood Farm, which addresses the pressing problem of food insecurity due to historical racial and economic disparities in the predominantly African American community in southern Chicago. We assisted the farm owner to modify a hoop house for seed-starting infrastructure, enabling earlier crop harvests and extending the production season for fresh vegetables. We generated architectural plans, materials list and sourcing options, analysis of benefits and limitations, and funding sources. Our products contribute to creating a sustainable model for urban farming that tackles racial and economic inequalities in food access.

◆ **Poster 73** ◆

Whether the expression of different genes effects the physiology of the depots

Presented By: Nafia Naila

Supported By: Dr. James Cheverud, Biology

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. While environment and diet play a large role in the obesity levels of an individual, research has shown that genes affect obesity. In this study, we manipulate animals' diets with isocaloric high- (42% of kcals from fat) and low-fat (15% kcals from fat) diets. In this paper, we report on the genetic basis for variation in fat depots, particularly noting the different physiology amongst the fat depots and the way it affects metabolism and obesity.

◆ **Poster 74** ◆

Squad USA: Top Hat Pitch

Presented By: Lauren Nelson, Adnan Aldaas, Ana Girma, Charlotte Buehler, Thiago Picinini

Supported By: Dr. Stacy Neier Beran, Business; Heather Taylor, Top Hat; Chris Bruer, Top Hat

Squad USA delineated a targeted marketing approach for Top Hat, centered on its distinctiveness in empowering university professors to enhance student performance. Leveraging Top Hat's multimedia educational platform, the strategy aims to equip professors with tools to optimize classroom dynamics and student success. By integrating Top Hat's AI companion, ACE, into the strategy, personalized support and interactive learning experiences are prioritized, further enhancing professor-student interactions. Through strategic promotional initiatives emphasizing Top Hat's unparalleled capacity to drive student achievement and class excellence, the goal is to solidify its position as the preferred choice for educators seeking to elevate teaching methods within universities.

◆ Poster 75 ◆

Investigating Conserved Mechanisms of Cartilage Expression During Zebrafish Development

Presented By: Lila Nelson, Elise Adrian; Mulcahy Scholars Program

Supported By: Dr. Rodney Dale, Biology; Antonia Madonia

Our focus is on the highly conserved second exon of Col2a1a utilized during embryogenesis. Within this second exon is the von Willebrand Factor Type C (VWF-C) domain, which regulates the production of Bone Morphogenic Proteins (BMPs). BMPs are essential growth factors that signal development of the cartilage, heart, bone, and neural tissue formation. Using CRISPR-Cas9 we spliced out exon 2 to observe the change in BMP production and its effect on the growth and development of zebrafish embryos. We expect that the removal of exon 2 will severely impact the zebrafish embryonic development, characterized by abnormal morphology, and embryonic lethality.

◆ Poster 76 ◆

The Impact of Generative AI on Consumer Behavior in the Fashion Industry

Presented By: Sela Nequist, Talia Shutler, Reagan Hedlesten, Anna Klingler, Jennifer Alvarez, Victoria Sojka, Kaylee Swift

Supported By: Dr. Stacy Neier Beran, Business

This study examines the impact of generative artificial intelligence (AI) on consumer behavior in the fashion industry, with a focus on its implications for EdTech software companies. Using a mixed-methods approach, combining qualitative interviews, focus groups, and surveys, the research explores how AI influences what consumers like, buy, and engage with in fashion. Key areas of investigation include the role of personalization, creativity, sustainability, brand reputation, authenticity, and pricing in shaping consumer responses to AI-generated fashion. The findings aim to provide valuable insights for an EdTech company looking to develop educational resources and tools that align with emerging industry trends and consumer preferences, thereby facilitating strategic decision-making and product development initiatives within the EdTech sector.

◆ Poster 77 ◆

Spatial distribution of microplastics in an urban river

Presented By: Jaden Nguyen, Eric Schults

Supported By: Dr. Timothy Hoellein, Biology

Rivers are sources of microplastics (i.e., particles 1 μm - 5 mm) to oceans, but their distribution within river habitats is unknown. We measured microplastics in 3 habitats (surface water, water column, benthic zone) at 4 sites in the Chicago River. We predicted a higher number and density of microplastics would occur in the benthic zone and farthest downstream. However, microplastics

showed high variation habitats and sites, by abundance and polymer. Assessments of microplastic distribution are needed to better quantify microplastics movement and retention. These data will inform watershed models of microplastic dynamics in rivers, and global plastic budgets.

◆ **Poster 78** ◆

The Role of Bicarbonate in Arthrospira maxima's Electron Transport Chain

Presented By: Stavroula Nicolaou, Leslie Castillo

Supported By: Dr. Colin Gates, Chemistry and Biochemistry

The cyanobacterium *Arthrospira maxima* is unique in its ability to thrive under high concentrations of dissolved inorganic carbon (bicarbonate) because it uses bicarbonate as its major inorganic carbon source. Bicarbonate plays a major regulatory role in PSII, with the best-characterized site coordinated to the non-heme iron, which sits between acceptor plastoquinones QA and QB. To investigate the regulatory roles of bicarbonate in PSII, bicarbonate was depleted from a functional site of unknown location with sodium formate. The cyanobacterium *Synechocystis* sp. PCC 6803 was also examined as its PSII structure is known. Connectivity of antenna pigments (chlorophyll and phycobilin) to photosystems was observed via 77K spectrofluorometry in response to bicarbonate depletion, which showed loss of chlorophyll connectivity in PSII and dissociation of the phycobilisome. Chlorophyll fast repetition rate fluorometry revealed that depletion of bicarbonate resulted in one population of PSII showing normal oscillations in water oxidation and another that stopped after two charge-separating events. This suggested that the water oxidizing complex remained active in the first fraction of centers. QA reoxidation kinetics showed that depletion causes the electron transfer time from QA to QB to take longer, which implies the primary site of depletion of bicarbonate by this method is at the non-heme iron. Cytochrome b6f redox kinetics revealed that through depletion, *Arthrospira maxima* experiences intense oxidation compared to *Synechocystis* sp. PCC 6803, which suggests a powerful PSI. P700 kinetics displayed a predicted delayed transfer of electrons to PSI, suggesting an effect of bicarbonate depletion there as well.

◆ **Poster 79** ◆

Roots & Shoots Garden Programming

Presented By: Katharine Nooyen, Sophie Miller

Supported By: Javier Torres, Hayt Elementary School

Young people are spending less time in nature due to increased urbanization and screen time, leading to diminished use of the senses, attention difficulties, and higher rates of physical and emotional illnesses. Our project mission is to encourage spending time outside to support students' mental and physical health at Hayt Elementary School. We are helping expand their Roots & Shoots after-school program by creating interactive lesson plans with worksheets and community exploration, and by supporting the students in growing their school garden. Our hope is to enhance students' connection to their environment.

◆ **Poster 80** ◆

Leveraging AI Personalization in EdTech

Presented By: Isaac Norten, Emma Larson, Alexander Sullivan, Anna Donada, David Modory, Isabella Hasler, Andrea Gonzalez

Supported By: Dr. Stacy Neier Beran, Business

This study investigates the potential of Artificial Intelligence (AI) personalization in social media to drive student engagement in a digital learning environment. We explore how AI is leveraged to tailor social media experiences, and the potential to engage students, fostering deeper interaction and motivation in digital communities. The research delves into the role of community interaction within these platforms and how AI can foster a more supportive and stimulating online ecosystem. Furthermore, the project examines how student motivation can be enhanced in the digital age through personalized content, feedback, and social connections facilitated by AI.

◆ **Poster 81** ◆

AI's Impact on Consumer Shopping Behavior

Presented By: Ella Oswald, Annika Raj, Ashley Kang, Tyra Pranger, Sydney Bispala, Sammie Spiwak, Benni Hoffmann

Supported By: Dr. Stacy Neier Beran, Business

Artificial intelligence (AI) is becoming increasingly relevant as it is adopted by companies and consumers. The research aims to analyze how AI is impacting the shopping industry, focusing specifically on changes in consumer behavior. Understanding AI's impact on the consumer industry is crucial for predicting how it may reshape the shopping experience. While not delving into the technical intricacies of AI, the focus will be on its effects on the decision-making process of consumers and its broader implications for various industries. The goal is to grasp the significance of AI's growing relevance, which is increasingly evident in society and businesses today.

◆ **Poster 82** ◆

Molecular Dynamics of Effector Binding to Anabaena ADP-Glucose Pyrophosphorylase

Presented By: Gianna Pane

Supported By: Dr. Ken Olsen, Chemistry and Biochemistry; Dr. Miguel Ballicora, Chemistry and Biochemistry

ADP-glucose pyrophosphorylase (ADP-Glc PPase) is a regulatory enzyme that catalyzes the first step in glycogen and starch biosynthesis. In oxygenic photosynthetic organisms, ADP-Glc PPases are mainly regulated by 3-phosphoglycerate (3-PGA) and inorganic orthophosphate. In our work we are studying this reaction specifically in the cyanobacteria *Anabaena*. Using molecular dynamics simulations, we are modeling changes in the structure of the enzyme resulting from the binding of specific mutations to the hypothesized allosteric site. We aim to use our structural results to establish the correct allosteric site for *Anabaena* and analyze how 3-PGA acts as an allosteric effector.

◆ **Poster 83** ◆

Comparison of "East" and "West" Narratives of Gender roles in Media

Presented By: Ashley Parks

Supported By: Dr. Anne Wingenter, History (John Felice Rome Center); Dr. E. Mine Cinar, Business; Dr. Ngyuen Luu Bao Doan, University of Economics – Ho Chi Minh City

Gender roles, and the narratives that follow them, carry great nuance in the media. This presentation will display research I conducted in analyzing the framework of gender roles in Rome, Italy and Ho Chi Minh City, Vietnam. While studying in Rome I analyzed a news source *Power & Gender* to pinpoint common themes within their approach to feminism. For HCM I conducted an analysis of *Center for Studies and Applied Sciences in Gender* and gathered surveys from the general population of HCM. This research provides a unique cross-cultural analysis of differing approaches to gender roles and issues.

◆ **Poster 84** ◆

Prenatal Care Utilization in Pakistan

Presented By: Hiral Patel, Mili Shah, Umar Hasan, Hiral Patel

This question was based on the literature review as the review gave us several insights on the various factors that affect prenatal health. We sorted through factors from the literature review such as marital status, living regions, socioeconomic background, number of children, etc. to find what stuck out in terms of creating a strong impact on prenatal health. Throughout this review, a major recurring theme emphasized the disparities in prenatal care across urban and rural regions.

Various studies highlighted challenges faced by pregnant women in rural areas, such as limited access to healthcare facilities and lower socioeconomic status. In contrast, others noted key challenges faced in urban areas, despite these areas commonly portrayed as having better access to health care resources. Ultimately, our research question was developed after a thorough literature review to contribute to the understanding of prenatal care utilization in Pakistan.

◆ Poster 85 ◆

Characterization of β -glucosidase (BglB) E129Q to Better Understand the Functional Consequences of Mutations on Enzymatic Activity

Presented By: Mansi Patel, Etinosa Imalele

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

Using kinetic assays, we visualize the enzymatic activity of β -glucosidase (BglB) mutant E129Q in comparison to wild type. We hypothesize that our mutant E129Q will demonstrate the same catalytic efficiency (kcat/KM) in comparison to the wild type because its overall Foldit score suggests a high likelihood of expression is the same and there is no change in the molecular interactions.

◆ Poster 86 ◆

Impact of Human Microbiome on Polycystic Ovary Syndrome

Presented By: Prachi Patel; Mulcahy Scholars Program

Supported By: Dr. Michael Burns, Biology

Polycystic ovarian syndrome (PCOS) is a complex endocrine and metabolic disorder commonly seen in women of reproductive age that is affected by multiple factors, one of which is the intestinal microbiome. However, the specifics of how gut microbes play a role in PCOS are unclear. The purpose of this study is to investigate the transformational changes in gut microbes in PCOS patients and the possible mechanisms by which the intestinal microbiome influences the progression of PCOS. As microbiomes have recently emerged as sources of treatment for various conditions, it is beneficial to understand the role of the microbiome in PCOS to acquire a potential therapeutic method for PCOS patients.

◆ Poster 87 ◆

Characterizing the Protein Structure and Function of B-glucosidase Mutant Enzyme L108E

Presented By: Priyanka Patel, Alyssa DiSalvo

Supported By: Dr. Emma Feeney, Biology

This project will focus on characterizing the function and structure of the mutant enzyme B-glucosidase (BglB) compared to wildtype using Foldit modeling, SDS-Page, and thermal stability assays. It is hypothesized that the mutant BglB protein will have a slightly decreased catalytic efficiency in comparison to the wildtype because the overall Foldit score indicates that an expression is unlikely, and the intramolecular modeling analysis points to decreased London dispersion forces with nearby amino acid interactions. Furthermore, previously published data on the L108E mutation supports this hypothesis. This research will aid in allowing artificial intelligence programs to make future protein function predictions.

◆ Poster 88 ◆

Surveying Botanical Microfossils from Paleontological Sediments To Reconstruct Ancient Habitats

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

Supported By: Dr. Yoel E. Stuart, Biology; Dr. Jacopo N. Cerasoni, Biology

Paleoecology studies interactions between organisms and their environment on geological timescales by reconstructing histories of environmental change. Paleobotanical microfossils, preserved plankton and plant parts, such as pollen, starch, diatoms, and phytoliths, are a key tool for paleoenvironmental reconstruction. Studying the abundance, distribution, and quantity of microfossils allows reconstruction of lake and neighboring terrestrial habitats. My project aims to reconstruct the environmental history of a 10-million-year-old lake in Fenley, NV to better understand the evolution of *Gasterostus doryssu*, a fossilized threespine stickleback fish.

◆ **Poster 89** ◆

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, Chemistry and Biochemistry; Dr. Tatiana Esipova, Chemistry and Biochemistry; Abigail Vargas, Chemistry and Biochemistry; Sara Abuhadba, Chemistry and Biochemistry; Nick Kaley, Chemistry and Biochemistry

Neurological disorders are of predominant concern, and some 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. We propose creating a sensor with high spatial and temporal resolution that will be sensitive, reversible, and selective to 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 Förster Resonance Energy Transfer. The changes in intensity will be monitored by the two fluorophores Pyridoxal-5'-phosphate and Cyanine 3 dye.

◆ **Poster 90** ◆

Expression and purification of the novel Thioredoxin-like protein 1 of the malaria parasite Plasmodium

Presented By: Marco Peters; Mulcahy Scholars Program

Supported By: Dr. Stefan Kanzok, Biology

During transmission from humans to mosquitoes, the protozoan parasite *Plasmodium* undergoes morphological changes in order to adapt to changing environments. The cytoskeleton, specifically the microtubules, plays a critical role in facilitating these changes. Microtubules in *Plasmodium*, structurally highly similar to human microtubules, perform highly specialized functions, specifically in generating and maintaining the highly polarized banana shape of the ookinete. The specialized functions of microtubules are facilitated by microtubule-associated proteins (MAPs). Very little is known about MAPs in *Plasmodium*.

◆ **Poster 91** ◆

Children's Emotional Engagement and STEM Talk in a Children's Museum

Presented By: Skye Peyton

Supported By: Dr. Catherine Haden, Psychology; Bianca Aldrich, Psychology

In this study, we observed parents and children engaging in an informal STEM learning activity in a museum. Our focus is on the effects of affect and child age on children's science, technology, engineering, and mathematics (STEM) learning in informal learning environments. We recruited 55 children (4- to 10-year-old, $M\ age = 7.17$, 38 girls) and their parents at the Tinkering Lab exhibit of the Chicago Children's Museum and instructed them to build a creation that flies in the wind tunnels. We video and audio recorded participants during the activity to code their expressed affect: verbally (e.g., "this is fun!", "it is so frustrating") and body language (e.g., jumping, clapping). Our analysis of expressed affect during tinkering is ongoing and will be completed ahead of the conference.

◆ Poster 92 ◆

Difference in Excitement While Watching Male vs. Female Athletes

Presented By: Lauren Pflueger, Isabel Butler, AJ Carrol

Supported By: Dr. Dinko Bačić, Business

Our research focuses on understanding the differences in which male and female sports impact viewers' excitement and attention. We are interested in the reason behind the differences in support, viewership, and overall perception between male and female athletes, especially when playing the same sport at the same level. More specifically, our research investigates whether the preference for men's sports over women's sports can be attributed to a difference in excitement or attention by answering the following research questions: (RQ1) Do viewers' excitement levels and attention differ between watching men's sports and women's sports?; (RQ2) Does the gender of the athletes impact the attention and excitement of viewers?; (RQ3) Does the viewer's gender impact the attention to male vs. female athletes? (RQ4) Is there a difference between a subject's self-reported level of excitement and physiological indicators of attention and excitement? To empirically evaluate our RQs, we plan to conduct a controlled experiment using human subjects. Participants will be shown two videos of men's and women's basketball, and biometric data will be collected to analyze attention and excitement; we plan to utilize eye tracking, facial expression recognition, and Galvanic Skin Response tracking to achieve this end. This data will be compared to participants' self-reported interest and attention levels in order to answer our research questions.

◆ Poster 93 ◆

Balancing the Scales: Investigating the Potential Impact of ADAM, a Novel Male Birth Control Method

Presented By: Marcus Piattoni, Grace Acosta, Ryan Chang, Geena Fajardo, Saniyya Butler

ADAM is a newly invented, non-hormonal form of male birth control that is projected to be FDA approved and widely available in 2027. This project seeks to examine the science of how ADAM works, alongside the social and ethical implications of a widely available method of male birth control. In particular, we will discuss ADAM's unique composition and how it maintains azoospermia or oligospermia in men. Then, we will discuss the social and ethical implications seen when comparing ADAM (including its clinical trials, method of use, and advertisement) to current methods of female birth control.

◆ Poster 94 ◆

Environmental Protection and Interstate Migration: The Effect of Endangered Species Regulations on Residential Moves in Michigan

Presented By: Nicolina Piccolo, Richard Melstrom

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

The Endangered Species Act (ESA) of 1973 is often criticized for creating undue hardship in suburban housing markets and rural industries. By restricting where and how development can occur, the ESA can affect land use, the type and availability of local jobs, and property values. However, whether these effects weaken local economies on the whole is unclear. This paper examines mobility in communities affected by ESA regulations. One group of concern is non-college educated workers, who are more likely to fill jobs in industries disproportionately affected by ESA regulations. We investigate the effect of the ESA on the mobility patterns of college-educated versus non-college-educated workers. Our research uncovers evidence that ESA regulations discourage moves to impacted communities, however the effect is concentrated among college-educated rather than non-college educated workers.

◆ Poster 95 ◆

Analyzing Students' Performance in Organic Chemistry II: A Conceptual Examination

Presented By: Andrey Pikovskiy

Supported By: Dr. Polina Pine, Chemistry and Biochemistry

This work presents a comprehensive analysis of student performance in the final exam of the second semester of Organic Chemistry. Focusing on key concepts such as Molecular Orbital theory, Lewis structures, spectroscopy, mechanisms, and synthesis, our study aims to provide a relative assessment of student mastery in these critical areas. The research utilizes data from the recent academic term, employing both quantitative and qualitative methodologies. We employ statistical tools to evaluate overall class performance and identify trends across the aforementioned concepts. Furthermore, the study delves into comparative analyses, exploring potential correlations between performance in different conceptual domains. Notably, Molecular Orbital theory, Lewis structures, spectroscopy, mechanisms, and synthesis are examined individually to identify specific strengths and weaknesses among students. This detailed examination allows for targeted insights into areas that may require additional emphasis or instructional approaches. The findings of this analysis contribute to our understanding of student comprehension in Organic Chemistry II, shedding light on the efficacy of instructional methods employed throughout the semester. The analysis aims to stimulate discussions on pedagogical strategies, helping educators tailor their approaches to enhance student learning experiences in advanced Organic Chemistry courses.

◆ Poster 96 ◆

Sikhism

Presented By: Erik Polik

Supported By: Dr. Yarina Liston, Theology

Sikhism.

◆ Poster 97 ◆

Characterization of the Function of the M114S Mutation for the Protein β -Glucosidase (BglB)

Presented By: Elizabeth Proctor, Miranda Olsen

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

We are characterizing the mutant M114S for the protein β -Glucosidase (BglB) to contribute data for the Design2Data Program. BglB is an enzyme that catalyzes hydrolysis of glucose monosaccharides from larger polysaccharides at β -glycosidic linkages. We accomplished this through methods such as enzymatic assays, thermostability assays, and SDS-Page electrophoresis; and digital modeling of the mutation in FoldItStandAlone. We are looking to compare our mutation to the wild-type BglB in terms of its T50 and Kcat to provide data for the D2D database. This overall project is important for the ability to predict protein function and structure from its sequence.

◆ Poster 98 ◆

Boise Cascade Investment Pitch

Presented By: Lucia Ramirez Lopez

Supported By: Dr. Steven Todd, Business

This presentation is an investment pitch based on the Boise Cascade Stock (BCC). Boise Cascade is a leading American manufacturer of wood products and distributor of wholesale building materials with over 58 manufacturing and distributing plants across the United States. After conducting thorough financial research and creating valuation models, I found a higher target price for the stock, suggesting that the share price is currently undervalued and, therefore, a good investment. Overall, this research delved into all sections of the company and industry to provide an in-depth analysis of the BCC stock.

◆ Poster 99 ◆

Characterization of PhLP3 in the Drosophila Gonad

Presented By: Gabriella Rant; Mulcahy Scholars Program

Supported By: Dr. Jennifer Mierisch, Biology

PhLP3 is a protein that is widely conserved across eukaryotes, and we hypothesize that it plays a critical role in the folding of cytoskeletal proteins. The *Drosophila melanogaster* gonad is a useful model for exploring the role of such cytoskeletal folding proteins given the changes in cell morphology throughout gametogenesis. In the absence of PhLP3 through a mutation of the gene CG4511, *Drosophila melanogaster* has displayed a decrease in fertility and gamete viability in both the testes and the ovary. We are seeking to characterize the role of this protein in the gonad to elucidate how PhLP3 affects gametogenesis.

◆ Poster 100 ◆

Safety Perceptions in Cook County

Presented By: Emily Richter; Interdisciplinary Research Fellowship

Supported By: Dr. David Doherty, Political Science

Using data from the annual Cook County Community Survey, this presentation will examine the factors that affect residents' perceptions of safety in their neighborhoods and other areas of Cook County. Using a linear regression model, we analyzed several predictor variables, such as ethno-racial identity, gender, frequency of public transportation use, and past experiences with crime. Examining these variables together provides insight into what factors may affect Cook County residents' feelings about safety. This research examines a salient issue and can be used as a tool for the creation of policy to increase public safety in and outside of Cook County.

◆ Poster 102 ◆

Motorola Solutions Foundation Cybersecurity Experiential Scholarship Program

Presented By: Erin Robertson, Sophia Homan, Sloan Luckie, Nancy Rojas, Laila Hamdan

Supported By: Dr. Eric Chan-Tin, Computer Science

In an era where cyber threats are continually evolving, cultivating a skilled workforce capable of defending against these threats is paramount. Cybersecurity competitions serve as fosters for talent, innovation, and expertise in the ever-evolving field of digital security. The program funded by the Motorola Solutions Foundation focuses on providing financial support to individuals engaging in cybersecurity competitions, thereby incentivizing and recognizing their dedication to honing their skills in this critical field.

◆ Poster 103 ◆

Studying H328N mutation to characterize the expression kinetics and thermal stability the b-glucosidase (BglB) protein.

Presented By: Ana Roiz Lizarraga, Cameron Moore

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

BglB protein has the ability to break down cellulose and other B1-4 linked sugars. For the purpose of this study a mutation on the wildtype protein at location H328N is being characterized. We hypothesize that B-glucosidase B (BglB) mutant H328N will demonstrate no change in catalytic efficiency (Kcat/Km) and thermal stability (Tm) in comparison to the wildtype BglB protein. From the Foldit score it can be hypothesized that the mutant will be expressed. Moreover, there are no changes in local interactions that will affect the expression, stability, or efficiency of the protein.

◆ **Poster 104** ◆

Input of macroplastics to urban streams following storms

Presented By: Therese Rolewicz, Kayla Villaraza

Supported By: Dr. Timothy Hoellein, Biology

Goal: Measure the amount of NEW macroplastics that arrive at a stream reach after a flood
Method: Before flood, remove all trash from a 50-70 m reach of a stream (N=3 reaches per site, at 12 sites total). Quantify amount (No/area), mass (g/area), and polymer composition. Predict: Input of macroplastics will be related to urbanization and size of the flood

◆ **Poster 105** ◆

Investigating the Reinforcing Effects of stimulating PrL, IL, and LH Inputs to the LDTg in Rats

Presented By: Kristen Rose; Provost Fellowship

Supported By: Dr. Stephan Steidl, Psychology

Past studies have shown optogenetic excitation of Laterodorsal Tegmental Nucleus (LDTg) inputs to the Ventral Tegmental Area (VTA) is reinforcing in rats and in mice. Here we tested whether excitation of afferent inputs to the LDTg arising from the Prelimbic Cortex (PrL), the Infralimbic Cortex (IL), or the Lateral Hypothalamus (LH) is reinforcing in rats. Results will allow us to better define the brain's reward circuitry.

◆ **Poster 106** ◆

CGI Inc. Investment Pitch

Presented By: Ana Luisa Rubio-Gamboa

This presentation is an investment pitch for CGI Inc., a Montreal-based IT services company, using various forms of research including industry analysis, financial analysis, and two different valuation models.

◆ **Poster 107** ◆

Neural Correlates of Audiovisual Integration in Infants at High Risk for Autism

Presented By: Priscilla Ruiz; Provost Fellowship

Supported By: Dr. Margaret Guy, Psychology

Individuals with Autism Spectrum Disorder (ASD) show evidence of deficits in integration of information across multiple senses. In this study, we will investigate audiovisual integration in infants that are at high risk of a later autism diagnosis. We will present participants with short dynamic video clips of faces and objects that have soundtracks that are either synchronous or asynchronous with the video. We will measure EEG to examine brain responses to different types of stimuli. This research will help us better understand how impairment in audiovisual integration develops in ASD.

◆ **Poster 108** ◆

Women and Leadership Archives Lighting Audit

Presented By: Natalie Russell, Allison Feldt, Kaylee Harper

Supported By: Dr. Sarah Ali, Engineering; Dr. Gail Baura, Engineering; Emily Reiher, Women and Leadership Archives

This presentation will describe the experience of measuring lux on the third floor of the Women and Leadership building to create comfortable and safe lighting for archives. Over the course of the 2023 Fall semester, we worked in a group of four students, measuring lux and working to create a solution fit for office space and within bounds of archive lighting laws via motion censored lights. Through this experience, we were able to deepen our own understanding of engineering design and work collectively to produce a solution for the archives.

◆ **Poster 109** ◆

Storm Mediated Transport of Microplastic in an Urban Watershed

Presented By: Olivia Schaul, Noelle Robinson, Christina Byrne; Provost Fellowship

Supported By: Dr. Timothy Hoellein, Biology

Rivers export microplastics (particles 1 μm - 5 mm) to oceans, and floods likely control the timing of movement, but measurements of microplastics during floods is rare. We quantified microplastics before, during and after storm events at 4 sites in the Chicago River. We predicted microplastics will be most abundant on the rising hydrograph limbs of flood hydrographs (i.e., the ‘first flush’ pattern) higher density polymers will occur during floods relative to low discharge, and microplastic flux will be related to storm intensity. Results will improve models of the plastic movement at the watershed scale and plastic mitigation efforts.

◆ **Poster 110** ◆

Investigating the “Positivity Effect” and its effect on Memory Recall of Different Age Groups using iMotions Eye-Tracking

Presented By: Natasha Schuckman

Supported By: Dr. Dinko Bačić, Business

This study aims to explore the “positivity effect,” a psychological phenomenon where individuals shift from focusing more on negative information in youth to preferring positive information later in life. Using the iMotions platform, participants will be exposed to photos and videos with positive, neutral, and negative content. Eye-tracking and facial expression data will be used to analyze gaze patterns, gaze duration, and emotional responses. The study aims to add to research on the “positivity effect”, specifically across different age groups and by assessing memory recall of different emotional stimuli.

◆ **Poster 111** ◆

The Smart Nose: Using Artificial Intelligence to Detect Volatile Organic Compounds

Presented By: Aniruth Kartike Senthilkumar, Sophia Matheson, Lauren Manusos, Lila Areephanthu

Supported By: Dr. Jason Streeter, Engineering; Dave Turner, SpaceBot ; Angelo Garetto, SpaceBot

Advancements in artificial intelligence (AI) have paved the way for innovative applications in various domains, including sensory technology. Integrating the BME688 gas sensor, a novel Smart Nose system was created that leverages AI to perform real time analysis and interpretation of gas resistance data. This poster details the experimental procedures and conclusions gained from an extensive AI training regimen and the product development process. Coupled with a graphical user interface (GUI) to aid in the monitoring of Smart Noses across a space, a solution to gauge and monitor the cleanliness of spaces was designed.

◆ **Poster 112** ◆

A Computer Vision Solution to Cross-cultural Food Image Classification and Nutrition Logging

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Presented By: Rohan Sethi; Mulcahy Scholars Program

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

There is a great need for people to be able to easily access the nutritional profile to better manage their health. Food image classification and nutritional logging uses deep learning to extract that information from analyzing food images. However, current computer vision applications that classify foods for the purpose of automatic logging of daily intake is limited by the western-biased datasets they are trained on. A diverse image dataset for training computational models for classification is not plausible as there are too many cuisines for any model to learn. We propose an investigation of cutting-edge deep learning approaches to design an adaptable application which can classify food images a model has rarely seen.

◆ **Poster 113** ◆

Unveiling Disparities: HIV Research in South African Marginalized Women

Presented By: Riya Shah, Isabel Almeida, Dzifia Searcy

Supported By: Dr. Tara Casebolt, Health Sciences and Public Health

Research Question- How do intersecting factors, including race and gender impact HIV risk and treatment accessibility among women in South Africa? Hypothesis- Women from marginalized racial groups in South Africa are anticipated to experience elevated HIV risk attributed to socioeconomic disparities, restricted healthcare access, and heightened susceptibility to social determinants of health. Furthermore, racial disparities are likely to impede healthcare access, leading to obstacles in accessing HIV testing, prevention, and treatment services for women of specific racial backgrounds

◆ **Poster 114** ◆

Ampicillin resistance dynamics and adaptation in evolved E. coli populations

Presented By: Nina Sharma; Biology Summer Research Fellowship; Mulcahy Scholars Program

Supported By: Dr. Caroline Turner, Biology

This project explores the complex relationships between antibiotic resistance, nutrient limitation, and bacterial adaptation, focusing on E. coli. Antibiotic resistance poses significant challenges to public health. Nutrient limitation plays a crucial role in shaping E. coli's ability to adapt and develop resistance against ampicillin. The Antibiotic Microbial Experiment examined the effects of different ampicillin treatments on E. coli populations. I used growth curves to analyze bacterial growth kinetics and the differential effects of antibiotic concentrations on the evolved bacteria. The findings from this project give insight to the trade-offs E. coli populations exhibit when coping with antibiotic stressors.

◆ **Poster 115** ◆

My Exploration of Hinduism

Presented By: Siya Sharma

As a Hindu by birth, I recognize the significance of deepening my knowledge about my religion. To accomplish this, I plan to visit a Hindu temple in Illinois and engage with the priests and community members. By conversing with them and learning about their experiences as Hindus, I aim to establish a stronger connection with my community. Exploring different religions and embarking on new journeys is essential for personal growth and fostering a sense of belonging.

◆ **Poster 116** ◆

Cotton Strips as a Model Substrate for Analysis of Leaf-Colonizing Fungi in Streams

Presented By: Trinity Shoemaker; Mulcahy Scholars Program

Supported By: Dr. John Kelly, Biology

Scientists have proposed that measuring the breakdown of plant leaves that fall into streams (leaf litter) can be a useful indicator of stream ecological health. Fungi are an important part of this process because they colonize leaf litter that enters streams and catalyze its decomposition. Cotton strips have been used as surrogates for leaves in studies of leaf litter breakdown in streams. My study assessed the validity of this approach by incubating cotton and leaves from four tree species in the Chicago River and analyzing their fungal communities. My results indicated that cotton and leaves supported similar fungal communities.

◆ **Poster 117** ◆

The Appeal of Gendered Colors and Endorsers on Certain Gendered Consumers

Presented By: Anna Skinner, Evey Kallmeyer, Paige Gutierrez

Supported By: Dr. Dinko Bačić, Business

Blue has been attributed to men while pink has been attributed to women. Brands use these colors with products to attract certain genders. Utilizing certain gendered endorsers to attract certain gendered consumers has also become prevalent. We used eye-tracking to analyze what gendered colored product attracts the gaze of each gendered viewer. We also visualized which different gendered endorsers capture the attention of specific gendered viewers. There was a survey included asking the preferences of product color and gendered endorsers at the end of the study. This research can explain if certain gender marketing strategies are relevant today.

◆ **Poster 118** ◆

Noise Level Management in the Lower Level Mezzanine

Presented By: Rinad Bin-Mahfoudh, Samantha Garcia, Rinad Bin-Mahfoudh

Supported By: Dr. Sarah Ali, Engineering; Dr. Gail Baura, Engineering; Chris Martin, Loyola Libraries

This presentation will be regarding noise level-management and data collection in the lower-level of the mezzanine area. Due to the mezzanine area, the lower level of the Cudahy library experienced loud noises. Over the course of the 2023 fall semester, we worked in a group of 4 students. We conducted experiments by measuring noise levels in the area under different conditions. Finally, we were able to present data that concluded administrative posters were the most efficient in lowering-noise level.

◆ **Poster 119** ◆

Sex Differences in Synapses of the Hippocampus and Cognitive Behavior

Presented By: Rumyr Sobrepena

Supported By: Dr. Monsheel Sodhi, Molecular Pharmacology and Neuroscience; Dr. Tristram Buck, Molecular Pharmacology and Neuroscience

This presentation will describe the sex differences in the synapse of the hippocampus and cognitive behavior. Estrogen impacts the expression of AMPA-type receptors and has been shown to impact dendritic spine density. Over the 2023 Fall semester and 2024 spring, we tested the hypothesis that males and females have differing levels of cognitive function due to differences in synaptic morphology and glutamatergic expression in the CA1 of the hippocampus. We used structural analysis methods and behavioral tests to test this hypothesis. This work has the potential to identify novel targets for the development of drugs that enhance cognitive performance.

◆ **Poster 120** ◆

Constructing a New Marketing Strategy for an Online Learning Platform

Presented By: Anna Sokolowski, Olivia Vuagniaux, Brenda Castro-Macias, Rene De Sola Zumarraga, Nathan Abner, Eli Stovall

Supported By: Dr. Stacy Neier Beran, Business; Heather Taylor, Top Hat; Christina Bruer, Top Hat

Our goal is to optimize the performance of an online learning platform through improving their marketing strategy. By conducting consumer research, we found ways to increase utilization among instructors in a classroom setting. Our approach involved identifying strengths, weaknesses, and areas for improvement, and using the blue ocean framework to create a strategy that will set our client apart from their competition. This presentation is a detailed report providing strategic recommendations for the company to capitalize on the competitive advantages attained from the valuable perspective and insights of college students.

◆ **Poster 121** ◆

The Big Bang

Presented By: Victor Soto

My presentation will be The Big Bang against the word that comes from religion. It is known that the Bible believes that God was the start and beginning of all creation although a theory followed with studies about the start of everything starting with a big explosion. I will be comparing and contrasting the word of scientist to the word of the church. I believe my topic is important when it comes to my class as it comes to the sciences and and their contribution in church.

◆ **Poster 122** ◆

Evaluating the role of the microbiome as a potential modulator of racial disparities across CTCL patients

Presented By: Elise Stagaman; Carbon Undergraduate Research Fellowship Program

Supported By: Dr. Michael Burns, Biology; Dr. Catherine Putonti, Biology

Previous work in our lab revealed significant racial discrepancies in outcomes among cutaneous T-cell lymphoma patients. This project is a follow-up prospective evaluation of the skin and gut microbiomes of CTCL patients to assess possible clinical and social explanations for poor outcomes experienced by black patients. Of note, this work profiles patient samples before and after narrow band UVB (nbUVB) treatment, which is differentially applied to patients as a function of skin tone. These findings, we hope, will serve to ameliorate another disparity in healthcare.

◆ **Poster 123** ◆

Encountering Sikhism: Dialogue and Discovery at the Gurdwara

Presented By: Ian Stagaman, David Llanes, Olivia Mauldin, Kate Rault, Denton Wilkinson

Supported By: Dr. Yarina Liston, Theology

This poster examines the religion Sikhism and our group's experience interviewing followers at the Sikh Religious Society's Gurdwara in Palatine. Sikhism, as we have learned in our Religions of Asia class with Dr. Yarina Liston this spring, teaches its followers to reject pride, lust, and anger for a life of honesty and generosity, extending aid to anyone who needs it. We learned firsthand from Sikh followers about how the religious tradition impacts their lifestyles, what they value most from their practice, and how Sikhism fits into the community and society as a whole.

◆ **Poster 124** ◆

Genome Editing and its Social Implications

Presented By: Matthew Swenson, Jacqueline Les, Julia Borowska, Katie Jabaay, Olivia Carfolo

Supported By: Dr. Jennifer Parks, Philosophy; Dr. Dawn Franks, Biology

The emergence of highly accurate gene editing tools like CRISPR-Cas9 has opened doors to modifying human phenotypes, allowing for improvements in physical, intellectual, and emotional capacities well beyond curing disease. The notion of "designer babies" sits at the heart of the debate, as enhancement blurs the lines between medical cure and the aspiration for idealized traits. Such progress in genetic manipulation presents ethical dilemmas surrounding themes of social inequality, discrimination, and eugenics. This poster will address the science behind the most recent advancements in gene editing technology as well as its ethical and social implications.

◆ **Poster 125** ◆

Water Tower Capital

Presented By: Omar Tinawi, Dylan Capucine, Erin Brett

Supported By: Dr. Steven Todd, Business

A large cap stock mutual fund simulation aiming to achieve alpha compared to the S&P 500.

◆ **Poster 126** ◆

Navigating Consumer Tides in the Entertainment Industry

Presented By: Kassia Torres, Maria Jones, Amelia Benza, Elizabeth Lukas, Emma

Johnson, Matt Maldonado, Ben Aguirre

Supported By: Dr. Stacy Neier Beran, Business

The rapid advancements in technology are reshaping the entertainment industry and influencing the preferences of consumers. This study explores how technological progress, including streaming services, virtual reality, artificial intelligence, and interactive storytelling, is influencing what entertainment consumers choose. By analyzing trends and research, it investigates why people are drawn to certain types of content, considering factors like convenience, personalization, immersion, and social interaction. Additionally, it discusses the implications of these shifts for content creators, distributors, and marketers. Ultimately, this research underscores the crucial importance for industry stakeholders to adapt and innovate in response to the evolving technological landscape, in order to effectively meet the ever-changing demands and expectations of modern consumers in the entertainment industry.

◆ **Poster 127** ◆

Angelology: The Creation & the Fall in Neon Genesis Evangelion

Presented By: Grace Trifunovich

This poster will walk through the angelology and comparisons Neon Genesis Evangelion has to the different creation and fall of humanity narratives of the book of Genesis. It will follow the basis of the world and lore behind the 1995 anime series Neon Genesis Evangelion and how it coincides with the biblically accurate representation of angels, as well as follows a post Eden world painted by the Genesis narrative.

◆ **Poster 128** ◆

Genetic and Proteomic Association Studies of Gestational Diabetes Mellitus and Type II Diabetes Mellitus in South Asians

Presented By: Vir Trivedi; Mulcahy Scholars Program

Supported By: Dr. Heather Wheeler, Biology

Genetic variance is highly involved in disease development. The primary variance focused on in this study that influence disease are single nucleotide polymorphisms (SNPs) – differences in genes by the measure of one nucleotide. SNPs are analyzed through Genome Wide Association Studies (GWAS). GWAS is a common statistical analysis tool that illustrates associations between specific SNPs and a complex trait in question. However, its use in the South Asian populations is lacking.

Specifically, analyses of gestational diabetes mellitus (GDM) among South Asian women are sparse along with Type II Diabetes (T2D) for South Asians as a whole. GWAS summary statistics from Pan UK BioBank and All of Us provide data demonstrating SNP associations among varying populations for GDM and T2D. Our results will help illuminate mechanisms from SNPs significantly associated with GDM and T2D. Insight into these mechanisms will be the basis for future research into the pathways associated with these SNPs and will provide the foundation for advancements in precision medicine for South Asians at risk for GDM and T2D.

◆ **Poster 129** ◆

Examination of Lepidoptera Diversity in Madre de Dios, Peru

Presented By: Marinda Vacanti, Amelia Schneider, Grace Niemiec

Supported By: Rev. Stephen Mitten, S.J., School of Environmental Sustainability

This project focused on cataloging diversity of the order Lepidoptera, which includes butterflies and moths, in the Madre de Dios river basin in the southwest region of Peru. Main methodology included using light traps to capture moths at night and daytime cataloging of butterflies based on convenience sampling. During sampling, butterflies and moths were photographed for later identification using iNaturalist with the goal of determining how many unique species of Lepidoptera occupy the Madre de Dios region. Additionally, our posters will be sent back to Inkaterra for future education of indigenous communities.

◆ **Poster 130** ◆

Analyzing Impact of the BglB Mutation M114S on Catalytic Efficiency

Presented By: Leonardo Vargas, Daniel Ghannad

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

We hypothesize that β -glucosidase (BglB) mutant M114S will demonstrate decreased efficiency (kcat/KM) in comparison to the wild type because its overall Foldit score change, which was near +5, suggests decreased stability. Due to a local score change over +1, this mutation is a significant part of the overall score change. Intermolecular modeling points to decreased local interactions caused by side-chain size.

◆ **Poster 131** ◆

Investigating DNA Triplexes and Their Role in Friedreich's Ataxia

Presented By: Isabella Vari; Mulcahy Scholars Program

Supported By: Dr. Brian Cannon, Physics

Understanding Friedreich's ataxia (FA) and the underlying mechanisms involved in being a trinucleotide expansion disorder. FA is a neurological disease caused by a low level of the frataxin protein and presents as issues with movement and increase in cardiovascular disease risk, specifically hypertrophic cardiomyopathy. This low level of frataxin occurs due to a GAA mutation/expansion within the first intron of the frataxin gene X25 on chromosome 9q13-q21.1. I want to use smFRET to better understand the DNA triplexes, R-loops, and the GAA expansion that ultimately leads to the frataxin deficiency and subsequent neurodegeneration. FA is also a disease that exhibits "anticipation", which is when the disease onset age decreases and the severity of the disease phenotype increases with each subsequent generation. This anticipation is due to expansion of trinucleotide repeats in specific genes that lead to decreased genetic stability. Once they reach a threshold length value, they lead to trinucleotide expansion disorders such as FA. The goal of this experiment is to quantify triplex formation in DNA and in DNA/RNA hybrids and examine how triplex formation can disrupt genomic architecture as a mechanism for genetic instability. Not only will this research be applicable to Friedreich's ataxia, but other neurological diseases/trinucleotide expansion disorders as well.

◆ Poster 132 ◆

Understanding the Role of SIFa Receptor in Drosophila Feeding and Circadian Rhythms

Presented By: Anayatzi Velazquez, Siddarth De, Andi Beaudouin; Provost Fellowship

Supported By: Dr. Daniel Cavanaugh, Biology

Drosophila melanogaster, commonly known as the fruit fly, possesses a brain area called pars intercerebalis (PI) that is homologous to the hypothalamus in mammals. The hypothalamus is responsible for the production of hormones that regulate hunger. Similarly, the PI utilizes signaling molecules to control feeding rhythms in the fruit fly. Among these molecules is the neuropeptide SIFamide. It remains unknown how the SIFamide influences the feeding and fasting patterns. Our project aims to identify the specific clusters of cells that SIFamide targets to mediate these behavioral patterns.

◆ Poster 133 ◆

Simulating a Healthcare Sector Mutual Fund

Presented By: Bianca Viver Ugarte, Andres Logroño, Josh Arsulowicz, Niko Apostolopoulos

Supported By: Dr. Steven Todd, Business

Mutual funds are some of the most common investment mediums for the average investor. Our research involves creating and maintaining a mutual fund based on stocks from the healthcare sector, including biotechnology, medical service providers, drug manufacturers, medical devices, pharmaceutical retailers, healthcare plans, and more. Over the semester, we conducted over 20 trade analyses and actions (including standard market buys, options trading, stop-loss maneuvers, and more) in an attempt to beat a benchmark fund (XLV (NYSE)). Using the simulation platform Stock Trak, we have monitored our fund daily better to understand the workings of a Wall Street mutual fund.

◆ Poster 134 ◆

Operationalizing "Central Asia" in an Ethnographic Collection

Presented By: Annabeth Walsh

Supported By: Dr. Catherine Nichols, Anthropology

This presentation concerns methods and epistemological considerations for identifying groups of objects in museum collections and building inclusive research datasets. Objects accessioned into museum collections are typically catalogued with a classification system that intends to standardize information that is recorded about objects. This project focuses on how objects from Central Asia in the May Weber Ethnographic Studies Collection are catalogued, as well as revising the current cataloguing system.

◆ Poster 135 ◆

Children and Creation: The Accessibility of the Story of Humanity

Presented By: Sierra Wann

Supported By: Dr. Lauren O'Connell, Theology

Childhood shapes the fundamental years of a person's beliefs and values system. A child's belief system is created from the stories, shows, and adults around them. Beliefs and traditions concerning religion are no different. Thus, it is of the utmost importance to evaluate how and who is interpreting the stories told. Through literary pop culture references such as Percy Jackson and the Olympians: The Lightning Thief, as well as The Beginner's Bible, it is evaluated how the creation story is

subverted for younger audiences and the implications that may result in one's understanding of the meaning of humanity.

◆ **Poster 136** ◆

Understanding the Role of SELENOF in Skin Cancer

Presented By: Madeline Warrick

Supported By: Alexandra Zigrossi, Cancer Biology; Brenna Flowers, Biochemistry, Molecular, and Cancer Biology; Dr. Mitchell Denning, Cancer Biology; Dr. Irida Kastrati, Cancer Biology; Dr. Peter Breslin, S.J., Biology

This presentation will describe SELENOF as a tumor suppressor and what is understood about the role of SELENOF in skin cancer. In a SELENOF KO mouse study conducted by Kastrati lab, SELENOF was found to be a tumor suppressor for SCC skin cancer. Additionally, arsenic has been shown to have an antagonistic relationship with selenium and is a co-carcinogen with UVB for skin cancer. Because of this, SELENOF levels in keratinocytes in response to UVB and arsenic were investigated. In understanding the role of SELENOF in skin cancer, there will be greater opportunities for cancer prevention, toxicology, and cancer etiology.

◆ **Poster 137** ◆

Exploring the Impact of Price Points and Monetary Factors on Students' Payment Method Preferences

Presented By: Jake Wilcox, Victor Adegoke, Gabe Abbas

Supported By: Dr. Katherine Alexander, Business

This presentation aims to explore the correlation between price points and students' preferred payment methods. We delved into this topic during the 2024 Spring semester, collaborating as a group of three students to gather and analyze data on Students' Payment Method Preferences. Our research focused on understanding how various price points influence students' payment choices and their monetary considerations. Through this project, we gained valuable insights into research methodologies and had the opportunity to share our findings with our peers, contributing to a deeper understanding of the subject matter.

◆ **Poster 138** ◆

Cook County Community Survey: Welcoming City? Attitudes Towards Chicago's Migrants and Migrant Policies

Presented By: Greyson Wilder; Interdisciplinary Research Fellowship

Supported By: Dr. Dana Garbarski, Sociology

On August 31, 2022, Chicago received the first bus in an unprecedented wave of migrants to the city arriving from Texas and being sheltered across the city. As a sanctuary and welcoming city, Chicago has pledged itself to support these migrants. This study seeks to explore how Chicago residents feel about the welcoming of these migrants to their city through a survey of Cook County residents, analyzing how this increase in migration affects attitudes towards migrants and Chicago's welcoming policies.

◆ **Poster 139** ◆

Enhancing Food Waste Management and Education Within Institutional Dining

Presented By: Hannah Yun, Chase Lewis, Frances Clinite, Aimee Vega

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

We addressed environmental sustainability within institutional dining at Loyola University Chicago in collaboration with Aramark, Loyola's dining services provider. Food waste contributes to global warming because decaying organic materials release methane. Waste reduction and composting decrease greenhouse gas emissions. Despite effective waste management in dining halls, inadequate education and non-compostable utensils limit composting effectiveness in public spaces. To enhance student awareness of composting and food waste initiatives, we designed a module for integrating composting education into the ENVS 101 course. We also investigated bamboo cutlery alternatives. Our results can help reinforce the efficiency of institutional dining sustainability.

UNDERGRADUATE RESEARCH IN DANCE:

MUNDELEIN, 409

11:30 AM - 12:15 PM

Supported By: Dr. Amy Michelle Wilkinson, Fine and Performing Arts

Practice-led Research in Dance by Loyola Dance Theater

Performances By:

Grace Bates	Christina Guzman	Cayla Skuran
Olivia Bran	Kara Hoag	Ellie Slowiak
Caroline Cady	Zoe Holland	Karla Suazo
Megan Clifford	Anna Labriola	Elle Yanick
Victoria Ehrman	Neva Lang	Kate Zipper
Isabel Goetzke	Bianca Loglisci	

The Body Speaks: Dance as Nonverbal Communication

Presented By: Grace Bates

Supported By: Sandra Kaufmann, Fine and Performing Arts

This presentation discusses dance as a form of nonverbal communication that brings together people and strengthens community. Driven by a lifetime as a dancer, dance teacher, and thesis research, this research deepens the understanding of dance as a cultural phenomenon represented in institutions. Throughout this experience I was able to deepen my relationship to the art form and the connections it has to community spaces and institutions.

Oral Presentations

12:45 PM – 1:45 PM

◆ Mundelein 204 ◆

◆ Mundelein 204 ◆

The Interplay Between Alternative and Modern Medicine in Western Society

Presented By: Charlianne Johnson

Supported By: Dr. Hans Svebakken, Theology

Despite the extraordinary and widespread successes of modern medicine, many people choose to practice methods of alternative medicine instead. In many cultures, alternative medicine is a revered tradition that has been practiced, with good results, for thousands of years. The West is now turning toward alternative medicine as well to supplement modern medicine, but there are some who are abandoning modern medicine completely, which comes at a detriment to their health as well as the health of society at large. The goal of my project is to explore what alternative medicine is, who chooses to practice it and why, what about it causing resistance to modern medicine, why it is becoming increasingly popular in the West, and in what ways its popularity in the West is harmful.

◆ Mundelein 204 ◆

Immunization Misinformation in Healthcare: Unveiling the Backfire Effect

Presented By: Anjali Patel

Supported By: Dr. Hans Svebakken, Theology

Vaccines remain as one of the most crucial public healthcare interventions, yet an increasing number of antivaccinationists have been raising controversy against vaccines despite the evidence provided against it by the healthcare community. This is most likely due to an increase in misinformation. Misinformation is known as false information that is spread regardless of involving an intent to mislead. Individuals frequently depend on this misinformation in their reasoning and decision-making, even after it has been corrected, due to the increase in misinformation familiarity. This influence can encourage misinterpreted or even dangerous behaviors, thus it is essential to determine strategies for reducing the effect by resorting to corrections. However, it has been argued that the correction of misinformation leads to a phenomenon known as the backfire effect. The backfire effect is a cognitive bias that occurs when people disregard data that contradicts their ideas while becoming more convinced of their original convictions. In this case, contrasting vaccine "myths" with relevant facts backfired, increasing false vaccine beliefs in the healthcare community. This study aims to investigate strategies to effectively combat vaccine misinformation and reduce the impact of the backfire effect, by promoting informed decision-making and public health safety.

◆ Mundelein 204 ◆

The Past, Present, and Future of the Anti-Vax Movement

Presented By: Burhan Sufi

The Anti-Vax movement is a social movement that opposes vaccine usage for several reasons. In this presentation, I'll be exploring some of the history of this movement dating back to the 18th century and examining its evolution over the years. The anti-vax movement is deeply rooted in socio-political issues across America and is an important example of the active dangers of misinformation and disinformation. I'll explore major players contributing to the mis/disinformation of vaccines, those who seek to profit from this rapidly growing movement, and how this mis/disinformation is spread. This presentation seeks to shed light on the anti-vax movement's historical and cultural context which has allowed it to grow so big and the dangers it poses for the future of healthcare in America.

◆ Mundelein 205 ◆

◆ Mundelein 205 ◆

The Body as a Temple: The Evangelical Body in Fitness and Eating Disorders

Presented By: Eleanor Desing

Supported By: Dr. Alice Weinreb, History

This presentation will consider primary sources of evangelical Christian fitness and eating disorder discussions of the 70s and 80s. While both evangelical and secular fitness cultures sought to control the body, the means of control differed based on the view of the ideal body. Evangelicals conceptualized the body as a temple that was to be spiritually satiated as a vessel for the Holy Spirit while secular culture conceptualized the body as a machine that was to be physically glorified as a symbol of power.

◆ Mundelein 205 ◆

Using Bioacoustics to Assess the Impact of Invasive Cattail (*Typha x glauca*) on Waterbird Diversity

Presented By: Madeline Palmquist

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

Great Lakes wetlands host diverse populations of waterbirds and support feeding, breeding, and migration. In the Shiawassee National Wildlife Refuge (SNWR) [Saginaw County, MI], invasive hybrid cattail (*Typha × glauca*) has homogenized wetlands by suppressing diverse native plant communities. Responding positively to eutrophication and altered hydrology, *Typha* dominates throughout the region limiting waterbird food resources. At three different sites (managed for *Typha*, *Typha* invaded, and a high quality site), I remotely collected bird occupancy using autonomous recording units (ARUs) and surveyed vegetation diversity surrounding each ARU. Water depth, plant community composition, and vegetation cover correlated with differences in waterbird diversity.

◆ Mundelein 205 ◆

The Prison Outreach Project (POP): Implementing a Research Based Outreach Program as an Extension of the Writing Center

Presented By: Jack Wolff, Jack Wolff, Audrey Hogan, Tylor Serpico, Bradley Orzada
Supported By: Amy Kessel, English; Melissa Pavlik, North Park University

This presentation will describe the implementation of a prison outreach program at the Loyola University Chicago Writing Center. The project, researched and developed by a team of ENGL 220 students in fall of 2023, modified the Writing Center's digital, written feedback format for prisoners' physical writing. In collaboration with North Park University, tutors have the opportunity to provide the incarcerated feedback on creative and work-related writing in alignment with university values of service and justice for all. In the future, these services can be expanded to other marginalized groups including immigrant and refugee populations, those in shelters, and the unhoused.

◆ **Mundelein 303** ◆

◆ **Mundelein 303** ◆

You're covered.... in Staphylococcus epidermidis

Presented By: Sandra Jablonska

Supported By: Dr. Catherine Putonti, Biology; Dr. Michael Carbon

Staphylococcus epidermidis is a prominent and often benign member of the human microbiota. While it predominantly colonizes the skin, it can also be found in areas of the human body, such as the urinary, gastrointestinal, and respiratory tract as well as the oral cavity. Comparative studies of *S. epidermidis* strains isolated from different anatomical niches on the same individual are limited. These studies include investigating strains isolated from different skin surfaces or different skin surfaces, an oral swab, and a nasal swab. Resident strains of *S. epidermidis* have been identified from the skin. Other anatomical sites have yet to be considered.

As a proof-of-concept, I recently investigated strains isolated from the bladder, vagina and perineal of the same individual. These strains were sequenced and their whole genomes compared. I found instances of the same strain shared between these different sites for a given individual. I also identified strains that were more similar to strains isolated from the same anatomical site, but from another individual. These findings suggest that *S. epidermidis* can both be shared between microbiota as well as not. These observations lead to our study which focuses on isolating and characterizing *S. epidermidis* strains from the urinary tract, nasal cavity, oral cavity, and skin of healthy female participants. Samples were cultured and *S. epidermidis* colonies were identified and their genome was sequenced. Bioinformatic analyses of these samples are ongoing as we characterize the genotypic diversity of *S. epidermidis*.

◆ **Mundelein 303** ◆

Exploring Niche Specific Adaptations in Staphylococcus epidermidis: A Machine Learning Approach

Presented By: Nirupama Shanbhag

Supported By: Dr. Catherine Putonti, Biology

While *Staphylococcus epidermidis* is primarily found on human skin, it has also been isolated from oral cavity and urinary, gastrointestinal, and respiratory tracts. 595 *S. epidermidis* genomes

from various parts of the human body were downloaded from NCBI and used to compute a pangenome with anvio. Genes unique to specific niches were identified, which may be conserved to increase fitness overtime. Highly expressed genes across a niche were also identified to understand phenotypic differences between niches. Machine learning models were tested to identify genes associated with an isolation source. Further investigation may provide insight into niche-specific adaptations for different species.

◆ **Mundelein 303** ◆

Interactions Between Lactobacillus Species and Urinary E. Coli

Presented By: Maria Steiling

Supported By: Dr. Catherine Putonti, Biology

E. coli is responsible for urinary tract infections and symptoms. Recently, Lactobacillus species have been used to help prevent or mitigate urinary tract infections. It is known that Lactobacillus impacts the growth of E. coli, however, the exact means by which this occurs hasn't been explored fully. This project explores the impact of multiple species of Lactobacillus cell-free supernatant on liquid cultures of E. coli. The project details the exploration of Lactobacillus metabolites, and their possible ability to induce temperate bacteriophages. The project also led to sequencing of several Lactobacillus strains and publication of their genomes into research databases.

◆ **Mundelein 304** ◆

◆ **Mundelein 304** ◆

The Role of Temperature in the Extremophile Galdieria sulphuraria to determine Trophic Switching.

Presented By: Kishan Bharwad

Supported By: Dr. Colin Gates, Chemistry and Biochemistry; Dr. Debashish Bhattacharya, Rutgers University

Galdieria sulphuraria (strain YNP 5572) is an extremophilic red alga with the ability to perform metabolic switching between autotrophy, heterotrophy, and mixotrophy. We are developing this species to understand the decision-making behind which mode of growth it operates under. This organism was grown under the ideal sugar glucose (+G) without sugar (-G), with and without diurnal light, and through a temperature shock from 30°C and 42°C. We have determined that the major factor contributing to metabolic switching for Galdieria sulphuraria is temperature.

◆ **Mundelein 304** ◆

Guardians of Growth: Exploring the Effects of Lactobacillus crispatus on Urinary E. coli Growth

Presented By: Cerena Sedano

Supported By: Dr. Catherine Putonti, Biology; Natalie Stegman, Bioinformatics

The urinary microbiota is a vast community, consisting of both commensal and pathogenic microbes. The interactions between said microbes can be attributed to both healthy and symptomatic lower urinary tracts. One particular species that is commonly associated with a

healthy urinary tract, is *Lactobacillus crispatus*. In comparison, high colonization of urinary *Escherichia coli* within the urinary tract is a common cause of Urinary Tract Infections (UTIs). This project explores how various strains of *L. crispatus* affect the growth of urinary *E. coli*. A combination of growth curves and genome analysis were used to investigate the bactericidal activities of *L. crispatus*.

◆ **Mundelein 304** ◆

Understanding the role of SIFa Receptor in Drosophila Feeding and Circadian Rhythms

Presented By: Anayatzi Velazquez, Siddarth De

Supported By: Dr. Daniel Cavanaugh, Biology

Drosophila melanogaster, commonly known as the fruit fly, possesses a brain area called pars intercerebalis (PI) that is homologous to the hypothalamus in mammals. The hypothalamus is responsible for the production of hormones that regulate hunger. Similarly, the PI utilizes signaling molecules to control feeding rhythms in the fruit fly. Among these molecules is the neuropeptide SIFamide. It remains unknown how the SIFamide influences the feeding and fasting patterns. Our project aims to identify the specific clusters of cells that SIFamide targets to mediate these behavioral patterns.

◆ **Mundelein 308** ◆

◆ **Mundelein 308** ◆

The Disruptive Effect of Probability Theory Upon the Natural Sciences

Presented By: Abraham Fielder, Natalia Waksmundzki

Supported By: Dr. Hans Svebakken, Theology

In the last few decades, the rapidly growing field of Data Science, and especially its underlying field of Probability Theory, has expanded into the realms of the Sciences, with powerful and destabilizing results. Probability Theory's systematic examination of the theories that constitute the assumptions of these Sciences have been powerful and destabilizing. In Paleontology, Probability Theory has called into question the ability of the Classical Darwinian "Tree of Life" model to explain the fossil record, especially as it pertains to the Cambrian Explosion. In Biology, Probability Theory has called into question the emergence of the dense information network contained within cellular DNA as well as epigenetic sources of cellular information. In Chemistry, Probability Theory has called into question the entire field of Abiogenesis, the emergence of organic molecules from inorganic chemicals. In Physics, Probability Theory has posed two conundrums requiring further explanation: the infinitely fine-tuned nature of the universe's natural laws and the emergence of the universe ex-nihilo. It is essential to the integrity of the Natural Sciences to vigorously apply the explanatory power of Probability Theory to each and every Discipline and embrace the alternative theories and worldviews that will inevitably arise therefrom.

◆ **Mundelein 308** ◆

"Unraveling the Nexus: How Christian Nationalism has Fueled the Rise of Science Denial and Conspiracy Theories"

Presented By: Maria Gottemoller

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Supported By: Dr. Hans Svebakken, Theology

This project aims to explore the interconnection between conspiracy and science denial and the rise of Christian nationalism in the United States. It plans to shed light on how Christian nationalism has helped undermine trust in established scientific institutions and led to the rise of QAnon conspiracy theories and science denial, especially following the effects of the COVID-19 pandemic. Take, for instance, how some Christian nationalist leaders have claimed that climate change is a hoax designed to promote a "globalist" agenda, which has led to misinformation and disinformation in the public regarding what climate science actually is or how, in recent years, especially after COVID, vacancies have been under attack and conspiracy theories have helped place doubt in public healthcare and disease prevention efforts. The widespread distrust of scientific organizations following the COVID outbreak not only spread fear and conspiracy about the virus's origins and treatment but led the groundwork for Christian nationalist groups to target scientific institutions and experts in a broader anti-establishment agenda.

◆ **Mundelein 308** ◆

The Need for Home

Presented By: Han Bak Kwak

Supported By: Dr. Hans Svebakken, Theology

This presentation will go over what is a home, and reflect on our society's relationship to the idea of a home. Using Mircea Eliade's, "The Sacred and the Profane", and Simone Weil's "The Need for Roots", I developed what is necessary for a home, whether that be on an individual level, or on a societal level. Then I observed what "home" means or looks like in our current society, and compared that with what I found.

◆ **Mundelein 403** ◆

◆ **Mundelein 403** ◆

Gene Annotation of lin-28 in Drosophila takahashii

Presented By: Mya Abuzir

Supported By: Dr. Jennifer Mierisch, Biology

The primary objective of this project is to assess the structural conservation of lin-28 within the insulin signaling pathway, across various Drosophila species. I mapped the location of lin-28 in D.takahashii and annotated its coding sequences. The annotation displayed good conservation of lin-28 between D.melanogaster and D.takahashii, showing only some divergence in the first and last coding exons. This project is in collaboration with the Genomics Education Partnership, in which these findings will contribute to the ongoing study of the role of topology in the molecular evolution of genes in the insulin signaling pathway.

◆ **Mundelein 403** ◆

The Role of DAXX in Triple Negative Breast Cancer

Presented By: Eva Gureghian

Supported By: Debra Wyatt, Cancer Biology; Dr. Clodia Osipo, Cancer Biology

One in eight women will have a form of breast cancer within her lifetime. There are multiple subtypes of breast cancer; the Osipo Lab is most interested in the most aggressive subtype known as triple negative breast cancer (TNBC). Death domain associated protein six (DAXX) is a protein primarily attributed with regulating multiple forms of cell death. We are interested in understanding DAXX in TNBC to manipulate and target cell-specific death pathways. Ultimately, our goal is to find specific treatments for a currently non-targetable form of breast cancer.

◆ **Mundelein 403** ◆

Investigating the Roles of Ribbon and Hindsight in Gametogenesis

Presented By: Amanda Swedrowski

Supported By: Dr. Jennifer Mierisch, Biology

In the adult *Drosophila*, Ribbon (Rib) and Hindsight (Hnt) are transcription factors expressed during gametogenesis. The Mierisch Lab has found evidence that rib overexpression can lead to a decrease of somatic follicle cells (SFCs) in ovarioles that assist egg maturation. Hnt is an important mediator of the mitotic/endocycle transition stage in ovariole somatic cells, and the Mierisch Lab has also found evidence that rib overexpression is linked to downregulating hnt expression in somatic cyst cells of testes. This study investigates if rib overexpression is linked to decreased SFC proliferation, and if hnt underexpression may interrupt proper spermatogenesis development.

◆ **Mundelein 404** ◆

◆ **Mundelein 404** ◆

Jungian Consciousness and Philo's Allegory of the Soul

Presented By: Jeremiah Herrod

Supported By: Dr. Lauren O'Connell, Theology

In this paper, I attempt to provide an analytic oversight of the three chapters of Genesis by using Junigan's Psychology of Consciousness and Philo's Allegory of the Soul. As I conduct this research I intend to discover additional hidden meanings aside from the main idea communicated in Genesis. Moreover, to discover connections between how these two schools of thought interpret consciousness and the nature of human beings similarly and differently. I think my presentation is important because it can entice a person to embark on the journey of self-discovery. And lead someone to ponder on one's understanding of human nature.

◆ **Mundelein 404** ◆

Rocky Horror: A Retelling of Genesis

Presented By: Lucie Pitt

Supported By: Dr. Lauren O'Connell, Theology

A pop culture analysis of The Rocky Horror Picture Show as it relates to the creation and the fall narrative in Genesis 1-3. Comparative analysis of Rocky Horror to the Bible and Gnostic interpretations of the Genesis Narrative.

◆ **Mundelein 404** ◆

Visions of Egypt in Classical Greek Prose: A Reader

Presented By: Campbell Rosener

Supported By: Dr. Leanna Boychenko, Classical Studies

As early as Homer’s “fair-flowing Egypt” with its “very beautiful fields” (Od.14.256, 263), the land of the Nile captured the imagination of Greece. It is no wonder: both near and far, similar and “other,” Egypt and Egyptians present a variety of lenses for viewing and analyzing “the barbarian”—and oneself. By the Classical period, Egypt appears in a wide range of authors and genres, becoming a reflection of earlier Greek literary tradition as much as a real land inhabited by actual Egyptians. Furthermore, Egypt was always a strange, mysterious land, but becomes viewed as a utopia with perfect government, and perfect memory of the past. This book takes works focused on Egypt and Egyptians from two authors, Isocrates and Plato, and presents a text and commentary suitable for Intermediate students of Ancient Greek to introduce them to reading large passages of text (and some entire works) in the original Greek.

In Isocrates’ rhetorical masterpiece, *Busiris*, Isocrates gives a defense of the mythical Egyptian king famous for sacrificing foreigners who appear in his land. He also provides a mini rhetorical treatise on the correct way to praise and accuse. In Plato’s dialogues, *Timaeus* and *Critias*, Plato transports his readers to Egypt where they learn about the lost continent of Atlantis and an important lesson about hubris. This book will provide the text and commentary for all of the *Busiris*, as well as the preface to the *Timaeus* and all of the *Critias*. These selected works can open discussion towards issues of diversity and identity as well as asking students to think about big, timeless questions such as what makes a government good, what leadership looks like, and what kind of a world we want to live in. With the current selection of commentaries, teachers of intermediate Greek often find themselves teaching one of two texts, *Lysias 1* or Plato’s *Apology*. A commentary on Isocrates’ *Busiris* and Plato’s *Timaeus* and *Critias* allows for a more diverse approach, appealing to a wider group of students.

◆ **Mundelein 406** ◆

◆ **Mundelein 406** ◆

A Comparative Literature Analysis of Community-Engaged Research in High v. Low Economically Sourced K-12 public schools

Presented By: Jon Colson, Izzy Miller, Kyara Infante

Supported By: Fatima Rasoul, Social Work; Peter Lachman, Social Work; Kylie Rogers, Social Work; Satyavati Patel, Social Work, Brooklyn Hamblen, Social Work

Community-Engaged Research (CER) is a tool that combines aspects of community service and research methodology to reach a common goal. However, there are notable differences in accessibility and quality of research regarding CER, and its effects in K-12 schools. Applications of diffusion of innovation and gaps in comparative research on CER expose differences between economically diverse K-12 public schools. These differences are prominently exhibited across Chicago Public Schools. Anecdotal reflections on CER within CPS schools also reflect these differences between K-12 schools. This combination of perspectives portray how it is utilized and how it can be implemented in the future.

◆ **Mundelein 406** ◆

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Investigating Disparities in Appropriate Mental Health Care Among Marginalized Youth

Presented By: Katherine Hudgens, Katherine Hudgens, Alivia York, Evelyn Garcia, Zoe Osbirn

Supported By: Fatima Rasoul, Social Work

This presentation will describe the various barriers and impacts that marginalized youth experience in regard to accessing adequate mental health care (ex. therapy, diagnoses, psychiatric evaluations, mentoring, etc.). Over the course of 2023-2024 academic year, we've been mentoring a middle-schooler in accordance with The Cities Mentoring Project in hopes to empower youth throughout Chicago Public Schools. Throughout our time in this program, we've been able to better understand the influence that CBPR research can have on marginalized youth's mental health, and how this research is directly working with marginalized youth to build various skills that contribute to their overall well-being.

◆ Mundelein 406 ◆

The Importance of Peer Relationships for Immigrant and Refugee Youth

Presented By: Victoria Ward

Supported By: Dr. Jeffrey Huntsinger, Psychology; Dr. Sungha Kang, Psychology; Andrea Donis, Psychology

Addressing an under-investigated area of research, this presentation looks at the association between peer relationship problems and symptoms of anxiety and depression in immigrant and refugee youth.

◆ Mundelein 407 ◆

◆ Mundelein 407 ◆

Deliberation and Determinism: Two Processes Affecting the Soul From Antiquity to Modernity

Presented By: Morgan Fuksa

Supported By: Dr. Lauren O'Connell, Theology

Notions of the soul, its corporeal and tangible makeup, and its division amongst gender has increasingly varied from Antiquity to Modern periods. For writers such as Origen, the soul implicates an inherent identity, seen through his belief in free will, and levels of rationality embedded into the soul based on gender. In modernity, notions of the soul have changed drastically based on the genre of literature surveyed. For Kate Chopin, a modernist writer, the soul is subjected to determinism, an inescapable process that subscribes to the idea that free will is absent, as outside factors will determine you to act certain ways, and deprive you of the ability to adequately make choices that will enhance your soul.

◆ Mundelein 407 ◆

Who Said It? The Qur'an, Murder Mystery, and the Fallibility of Language

Presented By: Amara Grajewski

Supported By: Dr. Lauren O'Connell, Theology

In Islamic interpretations of the first humans, the ability to use language made the world a categorizable realm. According to this view, language is an infallible strategy to define good and evil, making humans' eventual demise that followed their "fall" inevitable. However, the categories of good and evil are not always clear when conveyed through language. Using analysis of the philosophy of language and the murder mystery genre, this essay explores the ambiguity of language and the implications this fallibility has on moral justice.

◆ **Mundelein 407** ◆

What Gnostic Creation Myths Teach Us About the Modern Pro-Life Movement

Presented By: Katherine Hogenson

Supported By: Dr. Lauren O'Connell, Theology

Since the overturn of Roe v Wade, the trauma, pain, and dangerous uncertainty of pregnancy has come to the fore. Women forced to give birth to unviable pregnancies or under significant risk of harm now struggle through testimony of their suffering and take to the streets to exclaim their anger and fear. Knowledge of pregnancy's dangers is not new. In fact it is quite ancient, with explanations for this pain being found in Genesis 3 when God cursed Eve to experience pain in childbearing. So common was maternal mortality that those in antiquity addressed it by weaving it into the fabric of our creation. Today, those seeking to deny abortion access use Genesis to demonize those seeking abortion. Many even try to deny abortions for those who became pregnant under the pressure of rape or abuse. But this is also so traumatic that ancient Gnostic writers, using Genesis for their own creation account, attribute the introduction of evil and suffering to sexual assault and extreme maternal duress. Using feminist, theological, and psychoanalytic hermeneutics, contrasts will be drawn between these interpretations of Genesis as they relate to the trauma of sexual assault and the subsequent implications for abortion access policy.

◆ **Mundelein 408** ◆

◆ **Mundelein 408** ◆

Jainism

Presented By: Emma Campbell

Jainism is a religion characterized by non-violence, generosity, and renunciation. These are all qualities that are not very common in Western religions and society. I am going to visit Jain sites and talk to the followers about their every experience as a Jain.

◆ **Mundelein 408** ◆

Involving Youth in the Planning of School Policy

Presented By: Simone Eby, Alex Fitzpatrick, Allan Mussali Hanono, Kaia Reynolds

In the right contexts, more democratic school environments have proven to be beneficial to the mental health of students as well as the functioning of the school as a whole. We aim to answer the specific question of how involving youth in the development of school policies impacts their mental health and the ways in which it can benefit schools. Research has shown that considering youth perceptions when evaluating school policy can help increase student engagement,

empowerment, sense of agency, and the extent overall to which school policies actually help teachers, administrators, and students.

◆ **Mundelein 408** ◆

From Naked and Ashamed to Clothed and Guilt-ridden: Augustine of Hippo and Poor Things in dialogue with Genesis 2

Presented By: Jack Jones

Supported By: Dr. Lauren O'Connell, Theology

As biblical interpreters have tried to rationalize the (in)famous fall of humanity in Genesis 2, they often consolidate blame to the woman, Eve. Specifically, Augustine of Hippo's City of God portrays Eve in a purposefully negative light to fortify patriarchal domination. In this presentation, I will discuss how certain approaches to the interpretation of Genesis 2, specifically, "the fall", construct what Bernard Williams denotes as a culture of guilt, particularly in relation to women and feminine sexuality. Accordingly, I will also evaluate how the 2023 film Poor Things, posits parallels and subversion to scrutinize these insisted gender ontologies.

◆ **Mundelein 411** ◆

◆ **Mundelein 414** ◆

Label-Free Elucidation of Mechanism of GabR Transcription Regulation with Compensated Interferometry

Presented By: Madeline Ganshert

Supported By: Dr. Manisha Ray, Chemistry and Biochemistry; Dr. Dali Liu, Chemistry and Biochemistry

Considering the urgency to develop treatments to combat airborne infectious diseases, this project aims to address knowledge gaps to gain insights into the mechanisms of GabR transcription regulators that regulate key functions for bacterial survival and virulence. Specifically, the DNA-binding domain of GabR overlaps with sites of RNA polymerase (RNAP) binding, therefore, a biomolecular interaction between GabR, DNA, and RNAP is proposed. To investigate this, a label-free binding study using a free-solution assay combined with a recently developed Compensated Interferometric Reader is being assembled and used to detect changes in conformation upon binding in a way that emulates native conditions.

◆ **Mundelein 414** ◆

Morphological Differences Between the Sexes of the Spotted Sandpiper (SPSA)

Presented By: Grethel Juarez

Supported By: Dr. Michael A. Grillo, Biology; Tessa Patton, Bioinformatics; Dr. Sara E. Lipshutz, Duke University; Jessica Schaefer

Spotted sandpipers (*Actitis macularius*) are migratory shorebirds with a sequentially polyandrous mating system. Females compete for multiple mates, and males care for offspring. A study of a Midwestern population found that females have larger body mass and feather spots, but we do not know if other populations do too. We used PCR to determine our population's genetic sex

from blood samples and used R to compare morphological traits between females and males. We find sexual dimorphism in several morphological traits: tarsus, wing, bill length, and body mass. The Midwestern and California populations have evolved similarly, and have sexually dimorphic morphology.

◆ **Mundelein 414** ◆

Refining cross-population polygenic risk scores to optimize trait prediction in diverse populations

Presented By: Mansi Patel

Supported By: Dr. Heather Wheeler, Biology

We all have 99.9% of the same DNA with 0.1% genetic difference that contributes to many phenotypic differences, including disease risk. Using polygenic risk scores, we can combine the SNP effect sizes to show how likely an individual is at risk for a disease/trait compared to others. PRS-CSx is a python-based command line tool that integrates data from multiple populations to improve cross-population polygenic predictions. The results that I obtain from this project can help create better polygenic risk score models that can be applicable to all populations and not just populations that have more genotypic and phenotypic data

◆ **Mundelein 415** ◆

◆ **Mundelein 415** ◆

The Intersection of Sleep, Pain, and Executive Function in Girls Following the Menarcheal Transition

Presented By: Sofia Khatoon

Supported By: Jules P. Adornetti; Hannah Hagy, Psychology; Dr. Matthew J. Kmiecik; Dr. Amy Bohnert, Psychology; Paul Crowley, S.J., Santa Clara University; Kevin M. Hellman, University of Chicago; & Frank F. Tu, University of Chicago

Introduction. Adolescence is marked by shifts in sleep, both in terms of timing and quality. Little is known about how these disruptions in sleep relate to pain and executive functioning (EF) following the onset of menstruation (e.g., menarche) in females. This study examines the relations between 1) sleep disturbances and pain, 2) sleep disturbances and EF, and 3) pain and EF in a sample of adolescents who experienced menarche in the past year. Method. A community sample of biological females (n = 159; M age = 12.8; SD age = 1.1; 74% white) and their caregivers were recruited from a Midwestern metropolitan area. Caregivers reported on demographics, sleep disturbance (PROMIS Sleep Disturbance Short Form), and EF problems (BRIEF scales: Inhibitory Control (IC), Emotion Control (EC), Shift (S), Working Memory (WM), and Task Switching (TS) subscales). Adolescents reported on somatic symptoms (Children's Somatic Symptom Inventory: CSSI) and period pain ("Over the last three months, what was the average cramping pain you experienced with your period?"; rating scale 0 [no pain] to 10 [worst pain imaginable]). Results. A series of linear regressions investigated the relation between sleep, pain, and EF. Participants with higher somatic symptoms, but not greater period pain, experienced more sleep disturbance ($\beta = .098, p = .032$). More sleep disturbance was associated with more EF problems including EC ($\beta = .016, p < .001$), S ($\beta = .169, p < .001$), WM ($\beta = .136, p = .01$), and TS ($\beta = .169, p < .001$). There were no significant associations between either somatic symptoms or period pain and EF problems. Thus, adolescents who experienced more sleep disturbance exhibited higher levels of somatic symptoms and more difficulty with

emotional regulation, cognitive flexibility, and memory. Conclusion. Preliminary results indicate that sleep disturbance in the year following menarche is related to more somatic symptoms, but not more period pain. Further, sleep disturbance appears to be closely linked to EF problems. Data collection is ongoing, and actigraphy data on sleep (duration, quality) will be used to further investigate how sleep relates to pain and EF during this important developmental transition.

◆ **Mundelein 415** ◆

Group Interpersonal Psychotherapy for College Students (IPT-CS): A Thematic Analysis of Participant and Facilitator Content and Processes

Presented By: Joshua Knutsen

Supported By: Kirby Knapp, Psychology; Sarah Broner, Psychology; Maya Hareli, Psychology; Dr. Colleen Conley, Psychology

Interpersonal Psychotherapy (IPT) is effective for improving mental health by promoting interpersonal functioning. Despite mounting quantitative evidence of its benefits, research has yet to pursue an in-depth qualitative analysis of the content and processes within college-student-focused IPT sessions. Using data from a recent study piloting the efficacy of group IPT for College Students (IPT-CS), with 9 students over 8 weeks, the present study employed thematic analysis of session transcripts. Findings highlight several aspects of both students' and facilitators' content and processes within the group, and can help to advance understanding of the key elements and mechanisms of change in IPT-CS.

◆ **Mundelein 415** ◆

When "Everything is Not What it Seems": Romantic Relationships in Adolescent TV and its Impact on Young Women

Presented By: Thais Rulich-Maly

Supported By: Dr. Marilyn Krogh, Sociology; Dr. Elise Martel Cohen, Sociology.

TV has increasingly become entwined in the lives of young women. Shows like *Wizards of Waverly Place*, *Good Luck Charlie*, *Pretty Little Liars*, and movies like *Mamma Mia* show adolescent girls experiencing various relationships coming of age experiences. They reflect what life should or could look like. This paper searches for a relationship between adolescent TV shows and the reality of their female audiences. I first hypothesize that adolescent TV shows will have a negative portrayal of romantic relationships. I then hypothesize that romantic relationships in these shows will negatively influence women's ability to create romantic relationships as teenagers and young adults. Research was conducted through roughly 1 hour interviews with 6 female students and Kappa Delta Sorority members at Loyola University, Chicago. Favorite TV shows and relationship expectations/experiences as teens and young adults were discussed. Both of my hypotheses were proved correct. I found that adolescent TV shows the participants watched consistently portrayed unrealistic romantic relationships and created unattainable expectations and frustrating teen relationships. However, TV shows increased self-esteem by showing positive female friendships and family dynamics. This study will hopefully expand knowledge on the real impacts of adolescent TV on young women and will encourage a critical analysis of media narratives. This study can be used to expand current knowledge and for future research.

◆ Mundelein 503 ◆

◆ Mundelein 503 ◆

Development of Environmental Education Materials for Columbus Park

Presented By: Abbey Haynes

Supported By: Dr. Laura Brentner, School of Environmental Sustainability

◆ Mundelein 503 ◆

Community-Driven Resilience Countering Climate Change Impacts in the Caribbean

Presented By: Ruth Kristensen Cabrera

Supported By: Dr. Marlene Brito-Millán, School of Environmental Sustainability

As climate change becomes more pressing for Caribbean nations, community organizations, neighborhood groups, and individuals are taking action to increase resiliency of their communities and ecosystems to increased disasters and climate irregularities. Local organizing efforts are key to collective resiliency, such as shown by Puerto Ricans organizing for energy sovereignty in response to Hurricane Maria. This Summer 2024 study aims to assess different perspectives, approaches, and responses to climate change at a local level in the Caribbean through grounded theory interviews in the Dominican Republic, Puerto Rico, and Antigua and Barbuda. Here, I demonstrate key objectives, areas of work, study design, methodologies of intervention and expected outcomes. To respond to climate change for all communities, it is important to seek local empowerment in resilience efforts.

◆ Mundelein 503 ◆

Aquatic Temperature Monitoring Systems to Determine Effect of Wastewater Outflows on Invasive Crayfish Populations

Presented By: Amelia Schneider

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

A species of invasive crayfish (*Procambarus clarkii*) has been established and is of concern in the Great Lakes Region, specifically in the North Shore Channel (NSC) in the Chicago River. A wastewater treatment plant (WWTP) along the NSC was hypothesized to be increasing downstream water temperatures, creating a more ideal habitat for *P. clarkii*. A system of waterproofing and temperature logger installation was developed and implemented, with five loggers upstream and five downstream of the WWTP. The results will determine the effect of the WWTP on aquatic temperature and help with identifying other areas at risk for *P. clarkii* invasion.

◆ Mundelein 504 ◆

◆ Mundelein 504 ◆

Why you should invest in Ameriprise Financial

Presented By: Emanuel Avalos

Supported By: Dr. Steven Todd, Business

This presentation will describe and give analysis on why you should invest in this company. Over the course of this semester, I gather enough information and learned that Ameriprise is currently doing well and investors should consider buying securities from the company. All in all, through my analysis and research of the company, I confidently recommend to buy and will be giving my reason why.

◆ Mundelein 504 ◆

“Undiscovered Value: Bitcoin and Other Cybercurrencies as Perceived Through Their Usage”

Presented By: Harvey Runty

Supported By: Dr. Noah Butler, Anthropology

Cryptocurrencies, beginning with Bitcoin, have accomplished in a brief time window what no other peer-to-peer, alternative payment mechanism has been able to actualize in counter-party confidence, transaction speed, and circulation. The decentralized nature of the blockchain permits cryptocurrencies to facilitate transactions without being processed as a negotiable instrument, subject to governmental controls. These attributes make cryptocurrency usage palatable for groups and individuals seeking quick settlement and relative anonymity when making transactions, even across borders. Yet, these same qualities make cybercurrencies the target of certain governments and financial organizations. The proposed study explores the emerging hybrid exchange (HEX) market within cryptocurrency communities and how value is perceived when transferring remittances to El Salvador, by speculators trading on “cyber points of exchange,” and “Bitcoin Optimacists,” advocating for exclusive use of Bitcoin alone in all economic transactions. This work also explores how cryptocurrency usage patterns and circulation trends affect the worldview of originally small communities as the initial strategies employed during inception and initial deployment change with evolving perceptions of digital mediums of exchange.

◆ Mundelein 504 ◆

Union Activity and Stock Performance

Presented By: Anna Rutkowski, Avery Tritz, Grace LaLonde

Supported By: Dr. Katherine Alexander, Business

In light of recent union activity, we chose to examine the impacts of labor unions on a company’s stock price. We tested if the existence of a labor union within a company causes the company’s stock price to be lower than their non-unionized counterparts. After randomly selecting 100 companies from the S&P500, we utilized annual reports to identify the presence of labor unions. Subsequently, we used a regression analysis to evaluate whether the existence of a union had any significance on a company’s stock price. Our study results will be beneficial for company leadership and potential investors during decision-making processes.

◆ Mundelein 506 ◆

◆ Mundelein 506 ◆

Achieving Veteran Empowerment: Leadership Methodologies at Chicago Brigade

Presented By: Demetrius Karris

Supported By: Eric Prosser, Chicago Brigade; Josh Jones, Chicago Brigade

This abstract presents the leadership methodologies deployed during my time as a non-profit project management intern with Chicago Brigade. Chicago Brigade currently has the roles of CEO, CFO, COO, CMO, and CSO - all of which are held by student veterans. We tackle the challenge of transitioning student veterans into a civilian workforce by leveraging our collective experience and robust network. This abstract will be supplemented by analytics and statistics that exemplify specific examples of our leadership initiatives and their outcomes. Such evidence of our impact on veterans contributes to their continued empowerment. Additionally, I will continue assisting Chicago Brigade in refining and improving the transition process for veterans in order to achieve the most effective program outcomes possible.

◆ **Mundelein 506** ◆

The Association Between Exercise and Seeking Treatment for Substance Use Disorder in College Students

Presented By: Shanti O'Neil

Supported By: Dr. Fares Qeadan, Health Sciences and Public Health; William A. Barbeau, Health Sciences and Public Health; Dr. Kevin Quirk, English

This presentation will discuss our investigation of the relationship between exercise and seeking treatment for substance use disorder (SUD) in college students. Data from Fall 2015 through Spring 2019, from the National College Health Assessment, were used in multivariable logistic regression models. Students who met the guidelines had a 30.6% increase in the odds of seeking SUD treatment compared to students who did not meet the guidelines (aOR = 1.306; 95% CI 1.142–1.493). The observed association underscores the potential value of considering exercise and physical activity in the development of SUD treatment strategies for college students.

◆ **Mundelein 506** ◆

Tell Me Your Experience: Interview Analysis on True Belonging, Having a Sense of Community, and Social Justice

Presented By: Ashley Parks

Supported By: Dr. Elizabeth Lozano, Latin American and Latino Studies; Ayesha Abouelazm, Communication

Story is a powerful tool in creating understanding and exploring new perspectives. I am directing and producing a documentary exploring social justice, true belonging, and sense of community. I interviewed two Loyola Staff and two Loyola students about their journeys in these topics in hopes to understand how their experiences connect and differ with existing literature and research. The presentation will outline the findings of this cross analysis to provide unique perspectives and themes on social justice, sense of community and true belonging.

◆ **Mundelein 507** ◆

◆ **Mundelein 507** ◆

Analysis of Dental Microwear on Bats of Varying Craniofacial Morphology and Diet

Presented By: Greta Keller

Supported By: Dr. Kristin Krueger, Anthropology

Scientists have suggested an evolutionary relationship exists between the craniofacial morphology of bats and their diet. To test this relationship, dental microwear analysis will be performed on the teeth of five species of bats (n=100), all with varying dietary categories. This research will be conducted by molding and casting bat teeth from the Field Museum and collecting ISO surface roughness measurements of the molars. This study will allow for a more sophisticated approach to analyzing long term diet of bats and give a better understanding of the relationship between craniofacial morphology and diet in the bats' natural environments.

◆ **Mundelein 507** ◆

The Analysis of Phosphatidylethanol in blood by GC-EI-MS

Presented By: Samantha Morey, Helen Dobbemann, Emma Katubig

Supported By: Dr. James V. DeFrancesco, Forensic Science

Phosphatidylethanol (PEth) is a phase II biomarker formed in the walls of red blood cells that shows excellent sensitivity and specificity as a screening biomarker for chronic alcohol use and abuse. The goal was to develop a “point of care” means of detection and quantitation of PEth to identify alcohol misuse by patients in a clinical setting. This new method is effective at measuring the total amount of ethanol incorporated into the blood phospholipids in whole, dried, and potentially decomposed blood (ex. postmortem). This work is based on US patent 11,085,939 B2 titled “Quantifying Phosphatidylethanol from Blood Samples” published in 2021.

◆ **Mundelein 507** ◆

A Cross-Cultural Investigation of the Treatment and Experiences of Transgender Individuals in the Healthcare System

Presented By: Rhea Viswanathan

Supported By: Dr. Helena Palka-Hamblin, Biology

This study investigates healthcare experiences of intersectional transgender individuals, focusing on race, gender, and age intersectionality. Utilizing testimonials from Chicago's LGBTQIA+ communities and a literary analysis of existing research, it compares patient encounters at specialized and general care clinics. Factors like gender-affirming care and cultural sensitivity are evaluated. Data analysis seeks correlations between intersectional identities and healthcare experiences to inform a culturally-informed care model. Conducted from July 2023 to April 2024, the research aims to address disparities and advocate for inclusive healthcare practices for transgender individuals.

◆ **Mundelein 508** ◆

◆ **Mundelein 508** ◆

“Private Paths to Peace” Examining the Role of the Private Sector in Peacebuilding Through Disarmament, Demobilization, and Reintegration in Northern Ireland, Chicago, and Colombia

Presented By: Michael Clausen

Supported By: Dr. Molly Melin, Political Science

International efforts to end protracted conflicts have included sustained investments in combatants' disarmament, demobilization, and reintegration (DDR). While policy analysts have discussed factors that contribute to successful programs and have reasoned about the macro conditions that facilitate peacebuilding, there is limited information surrounding the factors that account for successful reintegration at the community level. This project considers the impact of entrepreneurship by communities and formerly incarcerated individuals on peaceful coexistence and focuses on DDR from the perspective of Chicago's 77 official Community Areas.

◆ **Mundelein 508** ◆

Understanding the Victim-Offender Overlap in Cyber Fraud Scams: Social Learning and Emotions

Presented By: Alexander Kierna, Dr. Loretta Stalans

Supported By: Dr. Loretta Stalans, Criminal Justice & Criminology

This study contributes to understanding victim-offender overlap (Berg & Mulford, 2020) in cyber fraud scams. Adults (N = 476) completed a Qualtrics online survey. Online peer encouragement and perceiving themselves as a target were consistent predictors across all three measures of victim-offender overlap and predicted perpetrating cyber fraud scams after controlling for low self-control and prior victimization. The offender first group were more likely to see themselves as a target and feel vengeful and were less likely to experience emotional distress or feel defeated than the victim first group. Social learning and emotions contribute to the victim-offender overlap.

◆ **Mundelein 508** ◆

Mentoring in Manipulation: Analyzing Social Networks and Motives Behind Fraud Scams in Cyberspace

Presented By: Nicholas Loomis

Supported By: Dr. Loretta Stalans, Criminal Justice & Criminology

Analyzing Cyber Scam Mentorship and Perpetration. This presentation will explain research findings on participation in online scams and deception as both a mentor and mentee. The research was conducted using Qualtrics to construct a survey and Amazon MTURK to administer it in two batches of participants. Data was coded into major categories including, access to IT knowledge, and participation in well-known serious and minor scams. Logistic regressions were then used to correlate and analyze different variables to create trends of behavior to be discussed. This research aims to provide a better understanding of where individuals gain the tools to exploit others for personal gain.

◆ **Mundelein 514** ◆

◆ **Mundelein 514** ◆

Preceding Political Violence: Donald Trump, Political Advertisement, and the Normalization of Contempt

Presented By: Sierra Wann

Supported By: Dr. Michael Schumacher, Criminal Justice & Criminology

Online, political rhetoric has led to an increase in political violence, radicalization, and dehumanization. This is driven, in part, by social media, which has blurred the lines between truth, ideology, and extreme speech. Recent scholarly work suggests that when contemptuous language is prevalent and supported by political figures, and when this speech is reflected in campaign advertisements, it increases radical ideas among constituents. Our project evaluates how and where Donald Trump's political rhetoric originated and in turn, how it reverberated throughout the American public during the 2020 election cycle.

◆ **Mundelein 514** ◆

A Breath of Fresh Air: Exploring Breathwork in Theatre

Presented By: Carmella Whipple

Supported By: Dr. Mark Lococo, Dept. of Fine & Performing Arts; Lee Keenan, Dept. of Fine & Performing Arts;

This presentation is an examination of breathing, censorship, artistry, and traditions in theatre. I explored how breathing can support an actor's process, and how it can shape the perception of a script. Using Sarah Ruhl's *Passion Play*, I expanded upon this idea to dive deeper into how breathing affects inanimate objects, concepts like religion, and what it can mean to lack the space to breathe. My project has given me the ability to communicate the importance of a detailed script analysis and acting process, and a deeper understanding of lung function and the history of breath in the arts.

◆ **Mundelein 515** ◆

◆ **Mundelein 515** ◆

Heavy Metal Contamination of G. Biloba

Presented By: Madeline Collins

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

Ginkgo Biloba, a widely-used herbal supplement, has garnered global popularity for its diverse array of purported benefits. However, concerns regarding the safety of herbal supplements have escalated in recent years, largely due to inadequate governmental oversight. Of particular concern are heavy metals, including lead, which have been detected in some of these supplements. In this study, we employed Atomic Absorption Spectroscopy (AAS) to assess the extent of lead contamination in Ginkgo Biloba supplements. Samples were subjected to microwave digestion in 25% nitric acid to prepare them for analysis. Our findings revealed varying degrees of lead contamination among the tested samples, underscoring the need for greater vigilance and regulatory measures in the herbal supplement industry.

◆ **Mundelein 515** ◆

The life history of the early camel *Poebrotherium* as inferred from osteohistology

Presented By: Kara Ehler

Supported By: Dr. Megan Whitney, Biology; Dr. Brandon R. Peacock, Idaho State University; Thomas G. Kaye

Camelid origins extend back to North America's White River Formation, a region significantly impacted by climatic shifts and tectonic activity throughout the Eocene and Oligocene epochs. Poebrotherium, a stem group member of Old World camels, was heavily reliant on available vegetation, making it susceptible to changes in the local environment. Any fluctuation in diet would be reflected in Poebrotherium's bone microstructure, thus allowing us to use paleohistology to reveal how climate, geography, and life history played a role in the evolution of Camelinae. Our primary histological results indicate that Poebrotherium grew rapidly into adolescence and was significantly impacted by seasonality.

◆ **Mundelein 515** ◆

Plant Biomonitoring of Heavy Metal Pollution in Chicago Industrial Corridors

Presented By: Kelly Zervos

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

Chicago industrial corridors are specific geographical areas that are protected for industrial usage. Industrial pollution is a growing concern for these areas, especially for surrounding communities who have growing health concerns over the resulting pollution. Heavy metal pollution occurs when industries release large amounts of these metals into the environment. Measuring this pollution is imperative as these metals can be toxic. Plant biomonitoring was utilized using *Daucus Carota* collected from two industrial corridors. Analysis was completed using GFAAS to identify and quantify heavy metals. *Daucus Carota* can provide reproducible results to determine heavy metal pollution in these communities.

◆ **Mundelein 519** ◆

◆ **Mundelein 519** ◆

The Bacterial Implications of Red Swamp Crayfish in Chicago's North Shore Channel

Presented By: Mikayla Ballard

Supported By: Dr. Reuben Keller, School of Environmental Sustainability; Dr. Gregory Palmer, School of Environmental Sustainability; Betsi Burns, Northwestern University; Ashley Williams, DePaul University

Red swamp crayfish are invasive to the Chicago area, and they are known to live in sewage outfall waters in the North Shore Channel. Through calculating average bacterial load, I determined that red swamp crayfish living in sewage-polluted water carry higher amounts of bacteria than crayfish living in non-contaminated waters. This adds a new layer to their invasion in Chicago, with red swamp crayfish potentially serving as a vector for high concentrations of sewage-associated bacteria to enter the food chain.

◆ **Mundelein 519** ◆

Plant-Soil Feedbacks and the Structuring of the Legume (Fabaceae) Microbiome

Presented By: Cian Dotson

Supported By: Dr. Michael A. Grillo, Biology; Dr. Andres Gutierrez, Biology

Plants play an active role in shaping their soil environments. These plant-soil interactions, known as plant-soil feedbacks, are ecologically relevant as they produce lasting changes to the soil environment that can affect the growth of future individuals on the soil environment. Most literature on plant-soil feedbacks focuses on plant modification of the abiotic environment. However, there is seldom research that examines the effects of plant soil-feedbacks on the biotic community. In this project, I seek to analyze the microbiomes of various legumes that experience varying histories of plant-soil feedbacks using 16S rRNA amplicon sequencing.

◆ **Mundelein 519** ◆

Virus-like-particles (VLPs): a tool to study CoVs

Presented By: Marinda Vacanti

Supported By: Dr. Thomas Gallagher, Microbiology and Immunology; Surovi Binte Sharmin Mohona, Microbiology and Immunology

The long-term goal of this project was to test a panel of putative inhibitors of CoV egress. During virus-like-particle (VLP) production, I observed a difference between MHV and SARS2 VLP release. I transfected 293T cells with plasmids encoding for all 4 structural proteins. As a control, the HiBiT tagged N protein alone was transfected. I expected to detect HiBiT signal only in the cVLP condition, however, in the N alone condition the SARS2 N got released, whereas MHV N did not. Density gradient centrifugation also supported this observation. This could indicate that SARS2 infection is more inflammatory compared to MHV.

◆ **Mundelein 520** ◆

◆ **Mundelein 520** ◆

Can Neural Networks Reach Human Vision Levels on Object Recognition Tasks?

Presented By: Luke Baumel, Mikayla Cutler, Joseph Tocco

Supported By: Dr. Nicholas Baker, Psychology; Dr. George K. Thiruvathukal, Computer Science

Object recognition transcends retinal images, challenged by angles, distances, light, and occlusions. Previous research indicates that Convolutional Neural Networks (CNNs) favor texture over shape in object recognition, unlike humans. To explore this, we created a dataset named ReTexture, featuring 100 3D models across 10 categories, paired with 100 matching textures. We generated 10,000 unique textured models, rendered from 12 viewpoints, resulting in 120,000 images. A human study assessed recognition across textures and angles, establishing a baseline for comparing CNN performance on the same tasks. This comparison aims to determine if CNNs similarly prioritize texture over shape.

◆ **Mundelein 520** ◆

Enhancing Creativity Through Stimulation of the Default Mode Network: Experimental Neuroscience and Computational Methods

Presented By: Diego Capetillo

Supported By: Dr. Robert G. Morrison, Psychology; Dr. George K. Thiruvathukal, Computer Science

Creative thinking involves generating and evaluating new ideas in response to problems. Generation of new ideas, or divergent thinking has recently been shown to be associated with activity in the default mode network (DMN) of the brain. In this project we attempted to demonstrate the causal role of the DMN in divergent thinking by using α -tACS to stimulate alpha brain waves in Posterior Cingulate Cortex and enhance DMN connectivity while participants completed an array of creativity tasks. Resting state EEG was recorded before and after stimulation to determine whether changes in brain activity mediated the relationship between stimulation and creativity. Co-Authored by: Kahiau Among, DJ Capetillo, August Decz, Maria Dima, Kyle Kovich, Emily Rokos, Robert G. Morrison

◆ **Mundelein 520** ◆

Fear memory engrams in the dorsal hippocampus during fear learning and fear generalization: Implications for vulnerability to post traumatic stress disorder

Presented By: Lola Fay Papanikolaou, Molly McAnespie

Supported By: Dr. Stephanie Grella, Psychology

Post-traumatic stress disorder (PTSD) poses challenges in understanding susceptibility factors, especially with women being twice as affected. Fear generalization, a key symptom, may result from memory-updating deficits, hindering the remapping of trauma-related memories in novel contexts. We aim to uncover genetic influences on these impairments and their interplay with experiences for susceptibility or resilience to stress. By pre-screening male and female c57BL/6 mice for a stress response, we investigated fear memory stability and flexibility in the hippocampus using viral tagging and imaging. Our future goal is to correlate these findings with gene expression to gain insights into potential PTSD markers.

◆ **Mundelein 603** ◆

◆ **Mundelein 603** ◆

Enhancing Default Mode Network Connectivity: Experimental Neuroscience and Computational Methods

Presented By: Rachel Abbe

Supported By: Dr. Robert G. Morrison, Psychology; Dr. George K. Thiruvathukal, Computer Science

The default mode network (DMN) in the human brain is involved in a broad array of cognitive functions, including creative thinking. Transcranial Electrical Stimulation (TES) is a popular non-invasive brain stimulation. TES has three types: Transcranial Direct Current Stimulation (tDCS), Transcranial Alternating Current Stimulation (tACS), and Transcranial Random Noise Stimulation (tRNS). The mechanisms of each TES method still need to be better understood. This study proposes simulation of the DMN using HD-tDCS, alpha-HD-tACS, high-frequency HD-tRNS, and sham. We intend to reveal how the three TES methods impact DMN activity and connectivity using scalp electroencephalography (EEG). Co-Authored by: Kahiau Among, DJ Capetillo, August Decz, Maria Dima, Kyle Kovich, Emily Rokos, Robert G. Morrison

◆ **Mundelein 603** ◆

Harmonizing Faith and Advocacy: Integrating Catholic Social Teaching in Gender-Based Violence Prevention in Peru

Presented By: Grace Shallal

Supported By: Dr. Paula Tallman, Anthropology; Dr. Jennifer Parks, Philosophy

This presentation explores the integration of Catholic Social Teaching (CST) in Gender-Based Violence (GBV) prevention interventions in Tambogrande, Peru. Specifically, we reviewed GBV prevention programs in Latin America and found that successful interventions involved men, women, and adolescents and struck a delicate balance between cultural responsiveness and challenging socio-cultural norms. In Tambogrande, Peru we are using CST principles to guide the development of GBV prevention intervention that emphasizes family well-being, shared responsibilities, and spiritual priorities. Future research will determine if incorporating religious values in community settings can enhance the effectiveness of GBV prevention efforts.

◆ **Mundelein 603** ◆

The Consequences of Blame: Media Coverage, Environmental Degradation, and Public Support for Environmentalism in the Global South

Presented By: Jameson Walker

Supported By: Dr. Sarah Maxey, Political Science

Colonialism and industrialization in the Global North significantly contribute to environmental degradation; however, contemporary media coverage often attributes blame onto the Global South. How does media coverage in the Global North misattribute blame for environmental degradation onto the Global South? What effect do these rhetorical tactics have on public support for environmentalism? To analyze the effect of these blame narratives, we conduct a news medium content analysis. We also conducted a survey experiment to capture the effect this coverage has on public opinion. We argue that American media's rhetorical tactics impact the public's perception of blame and tempers environmentalism.

◆ **Mundelein 605** ◆

◆ **Mundelein 605** ◆

LVMH Stock Investment Pitch

Presented By: Maria Lammens

Supported By: Dr. Steven Todd, Business

This oral presentation outlines an investment pitch for LVMH (Moët Hennessy Louis Vuitton), a global leader in luxury goods. I will demonstrate why investing in LVMH presents a lucrative opportunity by analyzing its strong financial performance and resilient business model. Additionally, I will address potential risks. This presentation aims to highlight LVMH's potential for investment in the luxury goods sector.

◆ **Mundelein 605** ◆

McCormick & Company, Inc. (MKC) - Stock Pitch

Presented By: Sebastian Radziszewski

Supported By: Dr. Steven Todd, Business

This presentation on McCormick & Company, Inc. provides a comprehensive investment analysis recommending a "buy/hold" for McCormick shares. Key drivers for this recommendation include McCormick's reliable and steadily growing dividends, portfolio diversity, strong brand recognition, and consistent year-over-year growth. The presentation delves into financials showing a healthy dividend growth rate, free cash flow resilience, and competitive positioning within the packaged food industry, substantiated by various financial models including Dividend Discount and Free Cash Flow to Equity models.

◆ **Mundelein 605** ◆

Capital One Stock Pitch

Presented By: Audrey Sidebotham

Supported By: Dr. Steven Todd, Business

This will be a presentation about why I recommend Capital One stock as a good investment.

◆ **Mundelein 606** ◆

◆ **Mundelein 606** ◆

CH Robinsons Unique Market Position

Presented By: Saba Kentchadze

Supported By:

This presentation will explore the investment potential of C.H. Robinson, a leading third-party logistics provider. Through the analysis of the industry, business valuation, financials, and investment risk I provide a comprehensive review of the company's current position and stock value. Also providing a detailed insight into their operations and the economic ripple effects of global supply chain disruptions.

◆ **Mundelein 606** ◆

Discover Financial Services Investment Opportunity

Presented By: Kristin Kostynick

Supported By: Dr. Steven Todd, Business

This presentation will discuss research on Discover Financial Services and how their stock could present investment opportunities. The presentation will explain research on Discover's overall business and how the company generates income. It will also discuss analysis of the industry that Discover is a part of, a discussion about Discover's financial analysis, valuation analysis, and investment risks. Finally, the presentation will discuss the type of investment opportunities that Discover Financial Services stock could present based on the research completed.

◆ Mundelein 606 ◆

Landstar System Stock Pitch

Presented By: Zachary Ochab

Supported By: Dr. Steven Todd, Business

In this IB project, we discover whether the stocks we picked are promising investments.

◆ **Mundelein 607** ◆

◆ Mundelein 607 ◆

The Nun's Habit as Sexual Fetish Object

Presented By: Isabella Cook

Supported By: Dr. Colby Dickinson, Theology

This presentation will introduce an argument for considering the habits of Catholic nuns as sexual fetish-objects. Designed with the Vatican's doctrine on vows of chastity in mind, the habit attempts to reconcile the irregular phenomenon of female (especially non-reproductive) sexuality by creating the illusion of a "glorious body" removed from economies of sexuality. In the knowledge that such a body cannot exist, the habit becomes a sexual fetish-object by highlighting the impossibilities of glorious/pornographic bodies and representing the normal sexual object of the body. The habit as fetish object both represses sexuality and provides nuns with alternatives to normative sexualities.

◆ Mundelein 607 ◆

She Had To Eat the Apple: Woman as Biblical Temptress in Survivor

Presented By: Isabella Cook

Supported By: Dr. Lauren O'Connell, Theology

This presentation will identify gendered interpretations of Genesis in the competition reality show Survivor. Real-world hierarchies and biases brought into Survivor by contestants have always played an obvious role in the creation of Heroes, Villains, and Winners. Retellings of the fall and original sin that deviate from the original text of Genesis are even explicitly used as metaphors by men against women who thwart them. Misogynistic interpretations of Genesis have contributed to the trope of woman as "evil" or "temptress" in a game where both money and morals are on the line.

◆ Mundelein 607 ◆

Why should maternal health disparities be minimized?

Presented By: Gabriella Schneider

Supported By: Dr. Takunda Matose, Philosophy

A growing problem in health care is the severity of maternal health disparities which include maternal and infant mortality rates being disproportionately high in minority communities. The impact these disparities have on the community leads to the question: why should maternal health disparities be minimized? In this presentation, I will provide background on maternal health disparities, and how they impact communities, especially minority communities. I will then argue that maternal health disparities should be minimized because they are rooted in racism and socio-economic factors. Furthermore, I plan to discuss how their minimization would positively impact the greater community.

◆ Mundelein 608 ◆

◆ Mundelein 608 ◆

A Comprehensive Approach to Enhance Food Sovereignty in Chicago

Presented By: Hanan Abdillahi

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

Hunger and food insecurity are complex societal challenges that require interdisciplinary solutions. In collaboration with the Food Systems and Sustainable Agriculture (FSSA) focus area in Loyola's School of Environmental Sustainability, I conducted research to identify ways that Loyola can learn from and support organizations working toward food sovereignty in Chicago. We interviewed representatives of organizations from varied food system sectors including producers, policy advocates, retailers, food aid organizations, and more. Thematic analysis across the respondents' experiences highlighted organizational strengths, challenges, and partnership opportunities. These insights aid in cultivating symbiotic relationships between LUC and community organizations, fostering mutual learning and sustained engagement in advancing food sovereignty initiatives.

◆ Mundelein 608 ◆

Cosmic Ray Anisotropy Using Ten Years of Data Collected With IceTop

Presented By: Gunwati Agrawal, Savannah Lehrman

Supported By: Dr. Rasha Abbasi, Physics; Dr. Paolo Desiati, University of Wisconsin - Madison; Dr. Juan Carlos Diaz-Velez, University of Wisconsin - Madison; Dr. Frank McNally, Mercer University

In this study, we investigate large-scale cosmic ray anisotropy across four distinct energy tiers: 310 TeV, 1.1 PeV, 2.4PeV, and 6.6 PeV, utilizing data collected by the IceTop air shower array spanning from 2011 to 2021. While prior research was conducted during the construction of IceTop, this work aims to provide an updated and more comprehensive distribution of cosmic ray arrival directions in the Southern Hemisphere using IceTop. Through these enhancements, our study aims to contribute valuable insights into the cosmic ray anisotropy landscape, shedding light on the intricate dynamics of high-energy phenomena in the Southern Hemisphere.

◆ Mundelein 608 ◆

A 3D Reconstruction and Segmentation of the Anolis sagrei Cranial Morphology

Presented By: Tyler Jensen

Supported By: Dr. Thomas Sanger, Biology

This project presents a revised 3D reconstruction of the *Anolis sagrei* (brown anole) skull. Each bone was segmented using CT scans and VGStudio Max software to enhance visual clarity. This refined model facilitates comparative studies between male and female brown anole skulls to enhance the understanding of reptile cranial morphology. By providing a detailed reference, this work contributes to broader research on reptilian skull morphology and supports future investigations.

◆ Mundelein 609 ◆

◆ Mundelein 609 ◆

Uncertainty and Inevitability: a Duality in Nature and its Mathematics

Presented By: Cecily Bartsch

Supported By: Dr. Xiang Wan, Mathematics and Statistics

From the trajectories of pollen particles to the federal interest rate in the next decade, uncertainty and inevitability is the underlying duality in nature. While modeling this phenomenon in mathematical abstraction, it is rarely tractable to find a precise solution, so research in both theory and programmatic execution is needed. Typical numerical programs coded under imperative paradigms rarely reflect the mathematical structure dictated by the modeling. This project showcases the use of a different paradigm—known as functional programming—which composes the problem as a set of functions (modular formulation), illustrating the duality in randomness through a case study.

◆ Mundelein 609 ◆

The Role of Vertical Integration on Case Mix Index and Hospital Profitability

Presented By: Ryan Love

Supported By: Dr. Timothy Classen, Business

I will explore the relationship between hospital acquisitions of physician practices, consolidation among hospitals, and patient complexity as measured by Case Mix Index (CMI). The study will combine data on physician and hospital ownership with hospital CMI data from the Center for Medicare and Medicaid Services. Based on prior research, CMI is positively correlated with hospital profit, meaning that changes in CMI due to vertical integration have implications for the profitability of hospitals. Thus, the outcome of the research can be used to suggest how vertical integration between hospitals and physician practices affects hospital profits.

◆ Mundelein 609 ◆

A Numerical Exploration of Brownian Motion

Presented By: Amanda Newton

Supported By: Dr. Xiang Wan, Mathematics and Statistics

Brownian motion is a mathematical concept describing the random motion of particles in a medium, according to a random distribution. This is a certain type of stochastic process, which are collections of random variables over some mathematical set. Brownian motion has many applications in physics, including particle physics and fluid and statistical mechanics, and any

other system involving the interactions of particles. Given the discrete nature of Brownian motion, numerical analysis can be used to study its properties.

◆ Mundelein 611 ◆

◆ Mundelein 611 ◆

The Intern Wears TJ Maxx: A Semester of Working for a Luxury Magazine

Presented By: Allison Kruse

Supported By: Ayesha Abouelazm, Modern Luxury Weddings Chicago

This presentation will explain and go in depth about my time working at Modern Luxury Weddings Chicago as an Editorial Intern. Modern Luxury Weddings Chicago is a bi-annual publication showcasing local luxury weddings and all the work that goes into them. Throughout my Spring 2024 semester, I spent time working hands-on to help create the full publication and gained an understanding of the editorial world.

◆ Mundelein 611 ◆

Science Denial and the Rising Harms of Misinformation

Presented By: Lucy Machiniak

Supported By:

My project will be about science denial and the harm it has on our society. Science denial is becoming a "normalized" topic and is seen everywhere on social media. I want to talk about how access to this information and access to groups of science deniers causes a huge harm to science, education and government. I also want to touch on misinformation because science denial and misinformation are heavily tied together. Misinformation spreads so quickly among the internet and various media platforms and it is difficult to figure out what is true and what is false when it comes to science, news, and world events. I want to show how both of these are causing harm to our society and will continue to get worse. With the rise of AI technologies there is no telling how much misinformation will be put out into what are commonly known as trusted sources.

◆ Mundelein 611 ◆

How family rejection and internalized homophobia affect LGBTQ+ individuals with ADHD's suicidal ideation and psychopathology

Presented By: Laurel Miskovic

Supported By: Dr. Zoe Smith, Psychology; Dr. Byron Brooks, Psychology

People who are part of the LGBTQ+ community face discrimination and stigmatization. Adults with ADHD are more likely to have comorbidities of other mental health diagnoses, most commonly anxiety and/or depression, and, like individuals who are LGBTQ+, have higher rates of attempted suicide. This study examined how family rejection and internalized homophobia impact LGBTQ+ adults with ADHD's symptoms of anxiety, depression, and suicidality (SI) using self-report measures. The findings of this study can help shape clinicians' understanding of

factors that contribute to an individual's psychopathology and the understanding of the risk factors of family rejection for adults with ADHD.

◆ Mundelein 616 ◆

◆ Mundelein 616 ◆

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

Presented By: Amanda Beaudouin

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 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-mediated knockdown of SIFaR, and find 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.

◆ Mundelein 616 ◆

Using Agent-Based Modeling to Understand Biofilm Growth and Eradication through Phages and Antibiotics

Presented By: Kathryn Cantrell

As the global need for alternate treatments against antibiotic-resistant bacteria rises, scientists rapidly search for solutions. Phage therapy, which uses bacteriophages to target specific bacterial pathogens, has become one of the most promising options. Bacteria can thrive in micro-communities called biofilms, whose structural importance suggests the need for a model which incorporates spatial effects. I will discuss various biological considerations for the development of a feasible mathematical model for phage therapy. Then, I will exhibit an agent-based simulation to demonstrate the interactions between pathogens such as *E. coli*, bacteriophage λ , the human innate immune system, and antibiotics. The objective is to use mathematical and statistical tools to identify optimal treatment strategies as they relate to the selection or combination of phage and antibiotic intervention.

◆ **Mundelein 616** ◆

Bridging Justice and Support: A Perspective from an Internship at a Domestic Violence Court

Presented By: Skyler Whitehead

Supported By: Rachael Persin, Social Work; Mini Datta, Social Work; Sarah Thompson, Circuit Court of Cook County: Domestic Violence; Rachel Whitney, Circuit Court of Cook County: Domestic Violence

This poster presentation will detail my undergraduate internship experience with the Circuit Court of Cook County in the Domestic Violence division. Throughout the 2023-2024 academic year, I had the opportunity to work closely with the Child Relief Expeditor (CRE) office—a program dedicated to offering practical support to both Petitioners and Respondents with children under orders of protection. My duties included providing resources and formulating multidisciplinary plans to ensure the safety and well-being of the children involved. This experience has illuminated the intersection of justice and support, inspiring me to share the insights gained during my internship with others.

◆ **Mundelein 617** ◆

◆ **Mundelein 617** ◆

How symptoms of ADHD and CDS in Black and/or Latiné youth affect Anxiety and Depression symptoms

Presented By: Madeline Warrick, Laurel Miskovic, Kayla Mikandawire, Angela Okechukwu, Terumi Randle

Supported By: Dr. Zoe Smith, Psychology

This study examines the effect symptoms of ADHD have on obsessions and compulsions in Black and/or Latiné youth. We expect to find a negative correlation between the quantity of inattentive ADHD symptoms and compulsions and a positive correlation between the quantity of combined ADHD presentation symptoms and compulsions.

◆ **Mundelein 617** ◆

The Monsters Within

Presented By: Karla Suazo

Supported By: Dr. Amy Wilkinson

This dance film is partially inspired by the popular video game Minecraft. This research went in-depth into the human psyche and the "monster" that manifests from negative emotions brewing inside oneself creating an internal war.

Research and Engagement Poster Presentations: Session 2

2:00 PM - 3:30 PM

◆ Poster 1 ◆

Examining Misinformation on Social Media Sites and the Characteristics that Predict Why It Spreads

Presented By: Rylee Abaya, Tanner Duderstad, Victoria Ward, Joi Rae Connor, Milka Georgieva
Supported By: Dr. Eric Chan-Tin, Computer Science; Dr. Loretta Stalan, Criminal Justice and Criminology

This study examined how the source and accuracy of information influence the likelihood it is shared and believed. Participants (n = 617) completed the survey via Prolific. The study used a 2 x 3 x 4 factorial design with two levels of information accuracy, three levels of sources, and four levels of topics (conflict in Iran, COVID-19, Climate Change, and the Balenciaga scandal). Participants were more likely to believe true information than false for all topics, and more likely to share true information for Climate Change and COVID-19. Future studies should explore methods to prevent misinformation from spreading.

◆ Poster 2 ◆

Recent Illinois Trends In Female Prison Population: Is the Number of Women in Prison Declining?

Presented By: Jannah Abu-Khalil,
Supported By: Dr. Amanda Ward, Urban Research and Learning; Dr. David E. Olson, Criminal Justice and Criminology

This presentation examines the often-overlooked realm of women's incarceration rates, focusing on shifts since 2020 and the impact of COVID-19. In collaboration with the Women's Justice Institute, there was a push to analyze a potential "bounce back" of women's prison populations after the pandemic, accounting for the severity of the offense, length of stay, and more. Despite a temporary rebound post-pandemic, the overall trajectory shows a decline in incarceration rates compared to pre-2020 levels. Understanding these trends – reduced crime rates, increased use of probation, and shorter prison stays – garner greater potential for targeted reforms in women's incarceration.

◆ Poster 3 ◆

Generating A88E BglB Mutant Protein to Characterize Catalytic Efficiency and Thermal Stability for Predicting Function

Presented By: Kimberly Acosta, Quinn Nkwenti
Supported By: Dr. Emma Feeney, Biology

The Design2Data (D2D) Database is made to determine whether protein structure and/or amino acid sequence can predict protein function. In order to collect more data for this database, we generated a missense β -glucosidase (BglB) A88E mutation. We characterized this mutation's function using an enzyme kinetic and thermal stability assay. Based on our initial sequence analysis and structural observation of this mutant protein, we predict that this mutant will demonstrate decreased catalytic efficiency and thermal stability compared to the wild type. At the conclusion of our research, we will upload our data to the D2D database.

◆ Poster 4 ◆

Using Immunoprecipitation-mass spectrometry to characterize changes in specificity during antibody affinity maturation

Presented By: Sami Ahmed; Mulcahy Scholars Program

Supported By: Dr. Joerg Zimmermann, Chemistry and Biochemistry

Binding affinity and binding specificity are two separate dimensions of molecular recognition. The former describes the affinity for the cognate ligand, while the latter describes the relative affinity of cognate to noncognate ligands. While the experimental determination of affinity is straightforward, it is much more difficult to measure specificity, since it requires the characterization of “off-target” binding to any of a large number of potential noncognate ligands. The goal of my research project is to use a new approach, immunoprecipitation-liquid chromatography mass spectrometry (IP-LC/MS), to characterize specificity of antibodies for their respective antigen as a function of their affinity maturation.

◆ Poster 5 ◆

Understanding how TikTok-style visual stimulation impacts viewers

Presented By: Adnan Aldaas, Nate Pascale, Omar Tinawi, Joao Moraes Barreto, Adnan Aldaas

Supported By: Dr. Dinko Bačić, Business

TikTok has risen quickly to popularity, something shown by the greater presence of TikTok format videos in other platforms, such as YouTube Shorts and Instagram Reels. In recent years, those videos have seen increasing levels of stimulation, including split screens, accelerated audio, subtitles, music in the background, removal of pauses, and others. Understanding how visual stimulation influences cognitive processes and emotional responses can provide valuable insights with broad-reaching implications across diverse fields. Several studies have attempted to assess the relationship between stimulating elements and retention. Our research aims to explore the impact of varying levels of visual stimulation on cognitive effort, retention, and emotional responses during digital media consumption, improving understanding of how TikTok format, high stimulation videos impact users. More specifically, we hope to address the following research questions:

R1: Is there an impact of TikTok-style visual stimulation on the visual attention and cognitive effort of the viewer?

R2: How does TikTok-style visual stimulation impact viewers' more immediate recall and accuracy?

R3: Is there an impact of TikTok-style visual stimulation on the viewer's subconscious affective/emotional response?

◆ Poster 6 ◆

Illinois Clean Energy Policy and Procurement

Presented By: Katherine Ambrose,

Supported By: Dr. Christopher Peterson, School of Environmental Sustainability; Anthony Star, Illinois Power Agency

This presentation will describe my applied research experience with the Illinois Power Agency (IPA) in our vision to enhance the state's clean energy portfolio by equitable and cost-effective means. Over the course of the Spring 2024 semester, I produced reports on program expansions and aided administrative operations of the Planning and Procurement Bureau, particularly providing research support on energy storage distribution grid impacts for the 2024 IPA Policy Study. Throughout this experience, I gained insight into state policy frameworks and stakeholder collaboration to advance a clean energy transition.

◆ Poster 7 ◆

A comparison of BglB Wild Type and BglB (E129Q) measuring the changes in the enzyme's kinetic and thermostability characteristics for input into the Design-2-Data (D2D) database.

Presented By: Elena Arias, Andrea Santamaria, Elena Arias

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

This presentation will describe the different procedures performed on a mutant form of BglB to compare it to the wild type. These comparisons are done in order to determine how a mutation in a protein's amino acid sequence can change the overall structure, configuration, and functionality of the protein.

◆ Poster 8 ◆

The Role of Cocaine-Associated Memories in Driving Relapse and Drug-Seeking

Presented By: Sonia Arora, Hazel Edwards

Supported By: Dr. Stephanie Grella, Psychology

Addiction entails a persistent relapse risk, a key recovery challenge. Relapse-prevention focuses on curbing cravings triggered by drug cues, the substance itself, or stress. The role of drug-related memories in this context remains unexplored. To investigate, we employed a doxycycline-inducible, Tet-tag system to label hippocampal cells linked to cocaine memories in mice and later reactivate these cells using light to recapitulate those memories. Mice underwent cocaine conditioned place preference training. After extinguishing this preference, we tested reinstatement using either a priming cocaine injection or optical reactivation of cocaine-related memories to assess if memories could trigger reinstatement as effectively as cocaine.

◆ Poster 9 ◆

Everyone Wants to be Neurodivergent: Misinformation about ADHD and ASD on TikTok

Presented By: Vanessa Barajas, Deena Z. Bahrami, Megan K. McCarron, Vanessa Barajas, Mikayla J. Cutler, Laurel N. Miskovic, Kayla C. Mkandawire

Supported By: Marcus Flax, Wellness Center; Dr. Zoe R. Smith, Psychology

This poster presentation will cover findings from a research study on misinformation about Attention-Deficit/Hyperactivity Disorder (ADHD) and Autism Spectrum Disorder (ASD) in which 240 TikTok videos about these neurodevelopmental disorders were examined to determine helpfulness vs. unhelpfulness. Our analyses reflect that in regards to unhelpful content, videos categorized as “misattributing,” which reduced symptoms to only ADHD or ASD, were the most viewed. The most viewed helpful content were videos categorized as “diagnostic criteria,” which listed symptoms from the DSM-5. The results may aid mental health professionals in understanding patients who often self-educate and diagnose themselves on TikTok.

◆ Poster 10 ◆

An Analysis of The Community Air Research Experience Learning Ecosystem Model

Presented By: Ixchel Barraza Zapata

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

I analyzed the geosciences learning ecosystem established through the NSF GEOPaths funded Community Air Research Experience (CARE) to identify programmatic elements that contribute to STEM identity among underrepresented minority (URM) undergraduate students. A key premise of the CARE educational model is that faculty can increase students' interests and

competencies in geosciences by engaging them in research activities on issues that directly affect their community. I conducted interviews with CARE project personnel and community partners and thematically analyzed those interviews plus student research products. My research advances understanding of how faculty can motivate URM students' interest and facilitate their success in scientific fields.

◆ Poster 11 ◆

Assessing Biochar's Influence on Soil Nutrients and Native Plants in Great Lakes Coastal Wetlands

Presented By: Eva Bednard; Mulcahy Scholars Program

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

Rampant invasion of aggressive species threatens native species in Great Lakes Coastal Wetlands (GLCWs). An emerging invasive mitigation strategy is the application of the soil amendment product, biochar, which has the potential to remove excess nutrients and pollutants from soils. However, little research has been done on GLCW native response to the addition of biochar. This project compares the effects of biochar addition to two common GLCW natives with its effects on the invasive cattail, *Typha angustifolia*. Project results can inform land managers about the survivorship of native wetland plants, allowing them to mitigate invasion without harming native species.

◆ Poster 12 ◆

Employing modularity to examine axial skeletal regionalization in the basal ostariophysan fish *Chanos chanos*

Presented By: Mitt Bhalani; Mulcahy Scholars Program

Supported By: Dr. Terry Grande, Biology; Claudia Kern, Biology

Under the supervision of Dr. T. Grande, with the assistance of graduate student Claudia Kerns, I will perform an in-depth study analyzing regionalization of the postcranial skeleton in the ostariophysan fish *Chanos chanos* (Anotophysini). My research uses micro-CT technology and 3-D geometric morphometric analysis to test if the vertebral column follows modular patterning, and if the most anterior module is homologous with the Weberian apparatus (a complex of modified anterior vertebral elements used to transmit high frequency sound from the water into the inner ear) of its sister group the Otophysini (e.g., carp, minnows, catfishes). I will test *Chanos* for modularity (existence of a network of interconnecting elements that is semi-autonomous from other such networks) in the anterior vertebral region with respect to more posterior vertebrae by landmarking digitized CT images using Stratovan Checkpoint software, and testing for co-variance and shape difference among individual vertebral elements using principal-component and maximum-likelihood analyses. Data from *Chanos* will be analyzed with data of representatives otophysans to test hypotheses of modular homology across taxa. This research will provide essential data to better understand regionalization of the vertebral column and, more specifically, if modularity of the anterior vertebral region led to a functioning Weberian apparatus only in otophysans, or if the modularity existed before the split between Anotophysini and Otophysini.

◆ Poster 13 ◆

Visting A Hindu Temple

Presented By: Hannah Blazina,

Supported By: Dr. Yarina Liston, Theology

For this project, I visited a local Asian religious site and wrote a paper about my first-hand experience interacting with religious leaders and practitioners. Through these multiple

interviews, I am able to better understand the religion and how the average practitioner practices their religion than if just getting information from a textbook.

◆ **Poster 14** ◆

Implementing Community Doula Navigators to Improve Perinatal Outcomes in BIPOC Individuals

Presented By: Sanjitha Boobalan

Supported By: Anastasia Harris, Center for Health Equity Transformation; Sharon Post; Dr. Melissa Simon

In the United States Black, Indigenous People of Color (BIPOC) women are at higher risk for pregnancy complications and maternal death. To address this, the Well-Mama intervention was designed. The intervention includes a “Community Doula Navigator” who has the skills of doulas, community health workers, and patient navigators to help mitigate racism and Social determinants of health (SDoH). A Well-Mama List includes 5 priority areas that are leading factors in Maternal Mortality: mental health; cardiovascular symptoms; safety; substance abuse; and social support. This trial will be conducted in Illinois, New Jersey, and Louisiana to test its impact on perinatal care.

◆ **Poster 15** ◆

Genera of Palms of the Peruvian Amazon

Presented By: Ethan Bower, Ethan Bower, Lily Walker

Supported By: Rev. Stephen Mitten, S.J., School of Environmental Sustainability

The densities of palm genera at different locations are dependent upon the environmental factors in the area. Throughout the study, we recorded and identified over 10 genera of palms at select locations across Peru along common paths of travel. From this study, we garnered over 2,000 individual palms and were able to draw conclusions about dispersal and habitat patterns.

◆ **Poster 16** ◆

Contracting Conundrum: Unraveling the Link between Government Contracts, Entrepreneurship, and Self-Employed Success

Presented By: Luke Brusstar, Nathaniel Kaufman, Christian Kephart

Supported By: Dr. Katherine Alexander, Business

This presentation examines government contracting and its impacts on self-employment and entrepreneurship. With datasets from the American Community Survey and the Federal Spending Guide, we created a correlation matrix and regression using Illinois data. We measured government contracts with variables such as self-employment and median household income with control variables for tech accessibility. Through our analysis, we found that government contracting is one way to promote success for self-employment and entrepreneurship. Providing adequate sources of funding can be essential in expanding access to entrepreneurial opportunities to communities that are in need of support.

◆ **Poster 17** ◆

Foul Play: Investigating the Sports Streaming Piracy Behaviors of Gen Z

Presented By: Brendan Burns, Sadie Noble, Maddie Plank

Supported By: Dr. Katherine Alexander, Business

This study will examine how piracy affects TV and streaming sports viewership behaviors among Generation Z. We hypothesize that piracy will have a negative relationship on viewership behaviors, and that the cost and convenience of streaming platforms are the most influential factors behind piracy. We also predict that moral concerns will have a negative relationship with piracy behavior. By analyzing existing literature and conducting our own survey, this study will collect both qualitative and quantitative data on streaming and piracy behaviors. Our findings aim to inform strategies for combatting piracy and enhancing viewer engagement of Gen Z for the major four sports in the US (NBA, NFL, NHL, and MLB).

◆ Poster 18 ◆

The effects that science deniers have on society

Presented By: Payton Canegan

This presentation will describe the ideology of science deniers with a main focus on flat earthers. The focus of this presentation will then focus on the effects of society when large groups of flat earthers follow the same ideology. After researching this topic I was able to find that the flat earth ideology is not adopted by people for the common reasons that most people think and this presentation will bring light to what the real reason is.

◆ Poster 19 ◆

Thermal Stress on the Neurological Development of the *A. sagrei* Lizard Embryo

Presented By: Alyssa Carlson; Mulcahy Scholars Program

Supported By: Dr. Thomas Sanger, Biology

Due to increasing temperatures around the globe, reptiles are facing an increased extinction threat. Previous research done by Dr. Sanger demonstrated that there is evidence to suggest that the brain could be the most sensitive embryonic organ to the influence of heat. Cell death has been observed within the ventral forebrain of a developing *A. sagrei* lizard embryo. Whether or not the rest of the developing brain regions also experience deterioration or are unaffected in the presence of heat has not been determined. This research will further develop our understanding of how heat affects the neural processes of the developing reptile embryos and to what extent the embryo could be affected at specific temperature ranges.

◆ Poster 20 ◆

Characterizing the phenotype of *TrxL-1* KO *P. berghei* using TEM

Presented By: Keeley Carney,

Supported By: Dr. Stefan Kanzok, Biology

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 the ookinete stage of development. To further study the role TrxL-1, we aim to characterize the phenotype of TrxL-1 KO *P. berghei* using transmission electron microscopy (TEM). To this end we present here the TEM sample preparation and imaging of wild type and TrxL-1 KO *P. berghei* ookinetes.

◆ Poster 21 ◆

Exploring the Influence of Bionormativity on Decision-Making in ART and Preventative Measures for Fertility

Presented By: Julia Carter, Leila Ikeda, Khayr Ahmed, Kelly Zervos, Alexis Rossi

Supported By: Dr. Dawn Franks, Biology; Dr. Jennifer Parks, Philosophy

Bionormativity is significantly considered in the decision-making process concerning assisted reproductive technologies (ART) or preventative measures in fertility. This desire for genetic relatedness— whether in full or in some capacity— is important for many individuals. Exploring the ethical and biological facets, this research seeks to elucidate bionormativity's influence on fertility-related matters. Pertinent questions investigate potential biological determinants such as hormonal influences or gestational periods underlying the preference for genetic bonds. Furthermore, we will explore the implications of these biological bonds on the value of adoption, and its ramifications on parenthood dynamics and parent-child relationships throughout the child's development.

◆ **Poster 22** ◆

Buddhism in Chicago

Presented By: Jack Cassidy

Supported By: Dr. Yarina Liston, Theology

Will be exploring the practices and cultural realities of Buddhism in Chicago.

◆ **Poster 23** ◆

The Gay Dating Experience: Partner Selection and Self Compassion in Short and Long-Term Daring Application Behaviors

Presented By: Elena Clim, Kris Enrile; Provost Fellowship

Supported By: Vincenzo Vassalotti, Psychology; Dr. Tracey DeHart, Psychology

The purpose of this study will be to examine the effects of self-compassion and relationship orientation, long-term oriented and short-term (or “Hook-Up”) oriented, and its influence on mate selection via dating app related behavior in the Queer male community. Through manipulating a self-compassion task, we will be studying the effects of self-compassion on participant response via rating proposed mates on attractiveness through the lenses of short-term and long-term relationship orientations. With this, we expect this study to provide insight to the relationship between the perceived self and the influence of personal compassion on the selection of mates and their inherent body image in the virtual dating environment. We expect those with high self-compassion to have a more body-positive and open mindset which will then provide more consistent ratings between both the long-term and short-term oriented lenses. For those with low self-compassion, we expect to see lower ratings of potential mates within the short-term lens, but consistency in ratings to that of their high self-compassion counterparts within the long-term orientation lens.

◆ **Poster 24** ◆

Investment Research for United Health Group

Presented By: Mitchell Curtis,

Supported By: Dr. Steven Todd, Business

Navigating Investment Opportunities: Analyzing UnitedHealth Group's Market Position and Growth Potential

This research scrutinizes UnitedHealth Group's (UNH) market performance and potential for investment. I will evaluate UNH's financial health, strategic initiatives, and market positioning in the healthcare sector, considering factors such as revenue growth, profitability, and competitive advantage. Additionally, I will analyze recent developments, such as mergers and acquisitions, and assess their impact on UNH's market outlook. Investing in UNH presents an opportunity for stakeholders to capitalize on the company's strong market position and innovative strategies in the rapidly evolving healthcare industry. Understanding UNH's competitive edge and growth prospects is vital for informed investment decisions in the dynamic healthcare market landscape.

◆ Poster 25 ◆

Factors in Outpatient Surgical Pain Management in the Loyola University Chicago Student Population

Presented By: Alise David,

Supported By: Dr. Kevin Mazor, Nursing

The increase in prevalence of outpatient surgical procedures has shortened patient discharge times, potentially increasing the risks for breakthrough pain events during the travel from the surgical center to the place of recovery. The literature suggests that adolescents suffer from suboptimal pain management after discharge from outpatient surgical procedures, but little is known about college-aged patients. The goal of this project is to determine what factors influence college-aged persons experiencing pain during the transition home from outpatient surgery, as well as the level of independence that they have in treatment of postsurgical pain.

◆ Poster 26 ◆

Sikhism

Presented By: August Decz, Osman Alam

Supported By: Dr. Yarina Liston, Theology

Sikhism is an Indian philosophy and religion originating from the Punjab region in India around 15th century CE. In this project we will aim to gain a better understanding of Sikh culture in Chicago, and how the community engages in their faith in this country.

◆ Poster 27 ◆

Modeling Molecular Aggregation in Blood Vessels

Presented By: Joseph Dingillo

Supported By: Dr. Jon Bougie, Physics

Computational modeling of the circulatory system has become popular in recent years for its flexibility in simulating various diseases. Scientists have given particular attention to modeling strokes, since many of the physical mechanisms that govern cardiovascular disease are misunderstood. We aim to model the physical mechanisms of molecular aggregation and microfluid flows. Shifts in population dynamics of molecules, proteins, and cells cause aggregation in the blood vessels. Due to this we use systems of stochastic differential equations based off Langevin Dynamics to model population dynamics and use the Navier-Stokes equations to model fluid flows.

◆ Poster 28 ◆

DapE and ArgE as Potential Novel Antibiotic Targets in Bacteria

Presented By: Victoria Ehrman; Mulcahy Scholars Program

Supported By: Dr. Daniel Becker, Chemistry and Biochemistry

Antibiotic resistance is a quickly growing problem with potentially devastating consequences that urgently requires a new class of antibiotics to solve. One such way to do this is by targeting the bacterial enzyme, N-succinyl-L,L-diaminopimelic acid desuccinylase, (DapE), which is part part of the lysine biosynthetic pathway and is critical for bacterial growth and development. DapE is uniquely found in bacteria—including ESKAPE pathogens, which can cause aggressive and deadly infection—making DapE an attractive drug target that alleviates the risk of mechanism based side effects in humans. To explore this we ran a high-throughput screen against HiDapE and subsequently obtained structure activity relationships to synthesize several series of inhibitors. These inhibitors were then tested against DapE in our ninhydrin based assay protocol followed by IC50s. To create the greatest potential for a broad spectrum antibiotic, the project has expanded to test inhibitors against other species of DapE including *A. baumannii* DapE and

V. cholerae DapE. We also began working with acetylornithine deacetylase (ArgE). This enzyme is in the arginine pathway and is specifically necessary for the production of ornithine; and thus the viability of the cell, making this another promising drug target. In addition to DapE, will begin to work with and present progress on ArgE.

◆ **Poster 29** ◆

Beyond the Clinic: Characterizing the Long-Term Individual and Familial Implications of ART-Linked Birth Defects

Presented By: Grace Ellerbeck, Delano Gonzalez

Supported By: Dr. Dawn Franks, Biology; Dr. Jennifer Parks, Philosophy

The ability to have a biological child when otherwise impossible via assisted reproductive technology (ART) has positively impacted the lives of millions of families. The world's first in vitro fertilization (IVF) baby was born in 1978, and in the nearly five decades since, the IVF success rate for women younger than 35 has improved to exceed 55%. Yet, the rapid scientific advancements behind IVF and other forms of ART do not come without the risk of more severe and potentially long-term complications arising. For instance, a higher rate of birth defects occurs after successful IVF cycles compared to natural conception. Regardless of their severity or duration, ART-linked birth defects present challenges unique to individuals and families that may not have initially been considered or were unknown entirely. Understanding these challenges is crucial to support the evolution of the industry as the number of ART-conceived infants born each year continues to grow. Thus, the aim of our project is to examine the individual and familial implications of ART-linked birth defects beyond their clinical significance by characterizing the indirect psychological and social effects of these outcomes on both the individual and their family members.

◆ **Poster 30** ◆

Opportunities Unshackled: The Effect of Educational & Vocational Programming on Prison Life

Presented By: Hannah Eure

Supported By: Dr. Amanda Ward, Center for Urban Research and Learning; Dr. David Olson, Criminal Justice and Criminology; The John Howard Association

This study examines the impact of educational and work opportunities on incarcerated individuals' prison experience. Using data from the John Howard Association's (JHA) 'Measuring the Quality of Prison Life Survey' distributed to all Illinois Department of Corrections facilities, we examine areas of well-being, security, professionalism, and harmony to determine the quality of life in prison. When comparing groups, our findings suggest a positive relationship between educational and vocational programming and a greater quality of life in prison. Throughout this experience, we deepened our understanding of Illinois prison culture, program effectiveness, and informed JHA's prison advocacy work.

◆ **Poster 31** ◆

Substrate Efficiency in Sustainable Microgreens Production

Presented By: Victoria Evans, Keira McCarty, Donatella Poveda, Ashley Klauk

Supported By: Kevin Erickson, Urban Agriculture

Due to their high nutritional value, microgreens are regarded as a healthy food and partial solution to food insecurity. Our project will experiment with sustainable substrates for microgreens production so that future urban agriculture participants may increase their accessibility in the future. The ideal substrate will be reusable or compostable, while producing the largest, healthiest yield the quickest with the least issues. Over 2 rounds of experiments, we measured response variables when growing microgreens on silicone mats, wood growing mats, compost, and soil. The response variables included:

yield/mass of harvest, mold/no mold, time to germinate/growth, taste, visual appeal, and presence/absence of disease.

The implications of our experiment are to determine the best substrates for sustainable growth that can be replicated by the Loyola Urban Agriculture Farm and produced for farmers market sales, as well as donations to organizations that promote food security.

◆ Poster 32 ◆

Struggles on the High Seas: Maritime Borders of the East and West

Presented By: Benjamin Fanelli

Supported By: Dr. Anne Wingenter, History (John Felice Rome Center); Dr. Ngyuen Luu Bao Doan, Univeristy of Economics - Ho Chi Minh City; Dr. Mine E. Cinar, Business

This presentation describes the issues that two countries, Italy and Vietnam, experience in regards to their maritime borders. Over the course of the Fall 2022 and Spring 2023 academic year I researched these issues with an eye for comparison between the East and West as part of the Ricci Scholars Program at the John Felice Rome Center and the now defunct Loyola Vietnam Center.

◆ Poster 33 ◆

Betadog Capital's Portfolio

Presented By: Dillon Ferreira, Edward Clinton, Matt Oliva, Jay Patel, Patrick Seas

This presentation will describe Betadog Capital's portfolio, including research, outcomes, and strategy that our firm undertook to compete against a chosen benchmark. Over the course of the Spring 2024 semester, our group actively managed a portfolio over 11 weeks and we wish to share our experience and convey our deepened understanding of portfolio management.

◆ Poster 34 ◆

The Development of Educational Objectives among Youth in Ethnically Minoritized and Economically Disadvantaged Communities

Presented By: Sabine Fiore

Supported By: Dr. Christine Li-Grining, Psychology; Maria Radulescu, Psychology

The present research explores education goals over time among racially minoritized youth. Both quantitative and qualitative data were collected from predominantly Latinx and Black youth from under-resourced communities. Bivariate correlation analyses suggest stability in education plans from 2018 to 2021, but this depended on youth's experiences during the COVID-19 pandemic. Qualitative data from 2018, 2020, and 2021 illustrate youth's decision making and persistence. Overall, these results provide a multi-faceted descriptive portrait of stability and change in education goals over time as well as resilience during the pandemic.

◆ Poster 35 ◆

The religious practice of Hinduism in the Greater Chicago area

Presented By: Isela Flores, Justyna Czopek

Supported By: Dr. Yarina Liston, Theology

This spring semester, a component of the course "Religions of Asia", required students to visit a religious site related to the Indo-Asian religions studied throughout the course. My partner and I visited the Hindu Temple of Greater Chicago in Lemont, Illinois. As part of our visit there, we photographed the temple buildings and conducted interviews with three

people. The interview covered questions about the history, the religious services, the demographics of the attendees, etc. Through this project, we were able to compare and contrast the beliefs of the religion that we learned in class to the first-hand experiences of its believers.

◆ **Poster 36** ◆

Identifying Symbiosis Patterns of Legumes and Rhizobia

Presented By: Mary Fontana, Jahin Rehonoma Hasan

Supported By: Joshua Melnick; Dr. Michael Grillo, Biology

Mutualism is a beneficial species interaction that arises through reciprocal coevolution in interacting species. Surprisingly, comparative population genetic structure between coevolutionary partners has received little attention. This is consequential as alignment in population structure can promote specialization whereas misalignment may restrict local adaptation and cause coevolutionary trait mismatches. Here we seek to examine population structure in the classic symbiosis between legume plants and nitrogen-fixing bacteria, specifically in *Astragalus lentiginos*, the most morphologically diverse taxon in the North American flora. Current efforts are focused on culturing rhizobia, which are predominantly from the genus *Mesorhizobium*.

◆ **Poster 37** ◆

Is Object-Based Warping Solely Object-Based?

Presented By: William Friebel; Mulcahy Scholars Program

Supported By: Dr. Nicholas Baker, Psychology

Object-based warping is a visual illusion in which the perceived distance between dots expands when they are superimposed on an object. Previous research found the illusion's strength varies with a display's perceived objecthood. We tested whether objecthood alone determines the illusion's strength or if separable low-level factors also play a role. We displayed dots nearby elements that configured into objects to varying degrees and tested whether configural strength itself or lower-level features like unity and convexity played a larger role in warping. Though objecthood played some role, we found that low-level features played a greater, separable role from objecthood.

◆ **Poster 38** ◆

Characterization of the Thermal Stability and Catalytic Efficiency of Mutant Enzyme pET29b-BglB(Y118F)

Presented By: Justin Frye, Joseph Guldan

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

The purpose of this experiment was to characterize the catalytic efficiency and thermal stability of the mutant protein pET29b-BglB(Y118F). The mutation of pET29b-BglB (Y118F) is predicted to cause a decrease in the stability of the protein structure which will cause an overall decrease in enzymatic activity and effectiveness. The mutation will cause an impact on the structure due to the position of the mutation, destruction of hydrogen bonds, and changes in hydrophilic interactions. The experiments conducted were used to determine the accuracy of the hypothesis.

◆ **Poster 39** ◆

interSECTIONS Project

Presented By: McKenzie Gallivan; Provost Fellowship

Supported By: Dr. Christine Li-Grining, Psychology; Maria Radulescu, Psychology

Latine and immigrant-origin youth are disproportionately susceptible to experiencing challenges like anti-immigrant rhetoric and racial microaggressions and are also more likely to experience poverty (Rojas-Flores & Vaughn, 2019; Rivas-Drake et al., 2020; Sanchez, 2021). The current study aims to better understand immigrant teens' experiences with the five social-emotional competencies (SECs). Survey and interview data were collected from ninth graders from an ethnically and racially diverse high school. Preliminary bivariate correlations indicated that teens with a stronger sense of ethnic identity and better self-regulation skills displayed better relationship skills and took fewer risks. Interestingly, stronger ethnic identity was also related to more social awareness (e.g., sociopolitical efficacy, critical action).

◆ Poster 40 ◆

Investigating the Association of Phosducin-like Protein 3 (PhLP-3) to Microtubules in a Cell Culture System

Presented By: Madeline Ganshert

Supported By: Dr. Stefan Kanzok, Biology; Manny Widuch, Biology; Arden Luers, Biology

Phosducin-like proteins (PhLPs) are highly conserved among eukaryotes from yeast to humans. Although their biological function is unclear, it is hypothesized that they are involved in microtubule assembly and folding. Here I investigate the potential PhLP-3 association with microtubules. To study this, I used immunofluorescence assays and confocal microscopy to determine the subcellular localization of PhLP-3 in the human U2OS cell line. My results show diffuse localization of PhLP-3 throughout the cytosol, indicating that the protein does not associate with microtubules. Our next step is determining whether PhLP-3 co-localized with cytosolic chaperone CCT, which facilitates tubulin folding.

◆ Poster 41 ◆

Genetic basis of different feather coloration in Northern Jacana (*Jacana spinosa*) and Wattled Jacana (*Jacana jacana*)

Presented By: Isabella Gates

Supported By: Dr. Sara Lipshutz, Duke University

Phenotypic traits such as differences in coloration act as reproductive isolation mechanisms. Two jacana species, *Jacana spinosa* and *Jacana jacana*, are in a hybrid zone in western Panama. In this hybrid zone, *J. spinosa* has been observed to parent more hybrid offspring than *J. jacana*. Differences in feather coloration may contribute to the reproductive success of *J. spinosa*. In this study, differences in the melanogenesis gene ASIP are investigated to better understand the feather coloration in *J. jacana* and *J. spinosa*, a trait that may influence reproductive isolation. We found six SNPs in the melanogenesis gene ASIP between the species.

◆ Poster 42 ◆

Creating An Assistive Technology For Children Who Experience Seizures

Presented By: Isabel Gliniecki, Logan Osborne

Supported By: Dr. Joanne Dunderdale, Nursing; Dr. Gail Baura, Engineering; Dr. Chad Johnston, Engineering; Dr. Sarah Ali, Engineering

This presentation will detail the process of creating an assistive technology for a child (age 6-12) who experiences seizures. This model is not intended to be given to children with seizures, but rather will be given to the Marcella Niehoff School of Nursing to teach students about accommodations. Our team communicated with our sponsor, brainstormed, created 3D models, and finally created a prototype of our model. We decided on a combination of a medicine

compartment and a head rest that is easily transportable for a child. This model will help nursing students better understand and assist children who experience seizures.

◆ **Poster 43** ◆

Criminal Court Up Close and Personal: Lessons Learned from a Criminal Justice Media Internship

Presented By: Anthoine Godin; Other

Supported By: Dr. Susan Dimock, LUC in DC

This presentation will describe lessons I learned about media and the legal system in my time as a criminal courts media intern. Throughout the Spring 2024 semester, I was able to sit in on D.C. Court shooting and homicide cases. I had the opportunity to write for a media outlet and learn how to report meaningful stories. Finally, I was able to experience major trials and the process's many steps. From this experience, I was able to deepen my understanding of the court system and learn to write concise and accurate stories in pursuit of transparency in our courts.

◆ **Poster 44** ◆

Forest Phenology Monitoring: A Robust and Sustainable PhenoCam Solution

Presented By: Damian Gonzalez, Aleksander Kacorzyk, Benjamin Dobbins

Supported By: Dr. Maryam Amouamouha, Engineering

The Morton Arboretum conducts extensive phenological research on trees, some of which they'd like to share with NAU's PhenoCam Network (PCN). The PCN is an international network of imagery used to track phenology in a wide range of ecosystems. This project's goal is to design and assemble a camera to run throughout the year, taking pictures to contribute to the PCN every half-hour from sunrise to sunset. The camera's housing must be durable, waterproof, and securely mounted. The camera itself must capture high quality images at predetermined intervals throughout the day to comply with PCN standards.

◆ **Poster 45** ◆

Optimizing Education with Tech

Presented By: Blanca Gonzalo, Blanca Gonzalo, Carlos Argueta, Evan Ciolek, Daphne Delgado, Cole Osiadacz, David Sagl, Thomas Slomiany

Supported By: Dr. Stacy Neier Beran, Business

The Dancing Monkey Research Project explores the role of innovative technologies in transforming education to meet the unique needs of all learners. By focusing on personalized learning, the study assesses how digital tools and platforms can adapt educational content, timing, and methodologies to suit individual preferences and learning styles. The goal is to improve engagement, understanding, and educational achievements for all. The goal is to explore how new technologies can customize education for diverse needs, improve student performance, and ensure fairness and accessibility, while addressing ethical concerns related to personal data and algorithms in educational settings. Insights from this research are aimed at guiding educators, policymakers, and tech developers towards creating more efficient and accessible learning environments.

◆ **Poster 46** ◆

Creationism vs Evolution: Religion or Science

Presented By: Javonni Grimes, Noah Dunbi

Supported By: Dr. Hans Svebakken, Theology

This presentation will highlight the ongoing debate regarding teaching creationism or teaching evolutionism in the classroom. There are numerous judicial cases that will be highlighted to support our answer in which should be taught in the class room and why. One viewpoint takes the approach that science can explain all things in the natural world while the other claims God is the answer for all things in the natural world. There is numerous debates regarding evolution having empirical evidence whereas creationism is more of a belief and is driven by faith. From extensive research we have been able to strengthen our claim and understanding of creationism and evolution, and by the end of this presentation we hope to strengthen your knowledge and understanding regarding the matter.

◆ **Poster 47** ◆

The role of familism in raising bilingual children

Presented By: Sophia Grippo

Supported By: Dr. Perla Gámez, Psychology

This qualitative study investigates the role that familism plays in how Latinx caregivers raise bilingual children. 31 semi-structured interviews with Latinx parents (Mean age = 33.11 years; SD = 5.09 years; nmothers= 31; nfathers=14) explored parenting strategies used to promote bilingualism in children. Interview transcripts (i.e., written records) were thematically coded and analyzed, revealing several themes regarding caregivers' values and practices in navigating bilingual parenting. Caregivers expressed values such as an obligation to instill bilingualism in their children to uphold tradition and a need to maintain relationships within their extended family network. Interviews revealed caregivers' practices of teaching bilingualism as well. Caregivers conveyed a dependence on extended family members to expose their children to Spanish, while also using their personal language experiences within their family context to influence how they promote bilingualism in their children. These findings demonstrate the significant influence of familism on caregivers' values of bilingualism, as well as the practices they employ to teach their children to be bilingual.

◆ **Poster 48** ◆

Surveying Mammal Populations in Madre de Dios

Presented By: Caitlin Gromacki, Brody Phan

Supported By: Rev. Stephen Mitten, S.J., School of Environmental Sustainability; Dr. Christopher Peterson, School of Environmental Sustainability

Our main purpose was to survey mammal diversity within the area of Madre de Dios, Peru. For our research process, we set up two camera traps and monitored them regularly over the course of one week. In addition, we recorded mammals that were seen during our excursions and were included in our results. Through our research, our main goal is to compare previous mammal diversity and abundance with our present findings, as well as propose further conservation implications towards these populations.

◆ **Poster 49** ◆

EphrinA's repel embryonic gustatory geniculate axons in vitro and in vivo and are expressed in the adult gustatory system

Presented By: Anna Grundhoefer, Rohan Jaiswal; Provost Fellowship

Supported By: Dr. M. William Rochlin, Biology

Ephs and ephrins are cell surface proteins that act as ligands and receptors for one another and typically mediate contact-dependent axon repulsion. We explored whether there is a role for this signaling system in the rodent tongue. We examined expression patterns of EphAs and ephrinAs in the tongue and geniculate ganglion, in-vitro responses of neurites to ephrinAs, and in-vivo knockouts of ephrinA1, -A3, and -A4. Together, this data supports a role for EphA-ephrinA

signaling in axon targeting in the embryonic rodent tongue. Preliminary data shows that EphAs and ephrinAs are expressed in the adult rodent gustatory system as well.

◆ **Poster 50** ◆

The Role of the Circadian Clock in Fat Body Transcriptomics and Metabolomics

Presented By: Charlene Guerrero, Amanda Samaras

Supported By: Dr. Daniel Cavanaugh (Associate Professor, Biology Department), Dr. Sumit Saurabh (Post-Doctoral Fellow, Biology Department)

Drosophila displays rhythmic feeding controlled by a central brain clock and exhibit rhythmic metabolite abundance. Whether metabolic rhythms arise from circadian clock control or secondary to rhythmic food intake is unknown. To differentiate between these possibilities, we conducted metabolite profiling in control flies and in flies in which CRISPR/Cas9 eliminated brain clocks. We included another clockless group subjected to time-restricted feeding (TRF) to impose feeding rhythms. We identified few rhythmic metabolites in controls and clockless flies. In contrast, we found that TRF clockless flies exhibited increases in cyclic metabolites, suggesting that metabolic rhythms are more strongly regulated by feeding rhythms.

◆ **Poster 51** ◆

A Ribbeting Survey of Anuran Diversity in Madre de Dios, Peru

Presented By: Eva Gureghian, Christina Wallis

Supported By: Rev. Stephen Mitten, S.J., School of Environmental Sustainability; Dr. Christopher Peterson, School of Environmental Sustainability

Madre de Dios, a region in southeastern Peru's Amazon Basin, is considered the country's biodiversity capital and makes up 15% of the Peruvian Amazon. We conducted a comprehensive six-day survey of local anuran species inhabiting the properties of Inkaterra Amazonica's Field Station. Anuran surveys were conducted by two to eight individuals at a time and within two meters of an established hiking path. Our findings hope to aid in the understanding and conservation of the anuran species richness in this region.

◆ **Poster 52** ◆

Fertility in a Changing Climate: How Extreme Temperatures are Affecting Pregnancy Outcomes

Presented By: Ella Hansen, Eric Delgado, Ella Whiteman

This presentation will focus on the dangers that climate change poses to pregnancy outcomes. While extreme high and low ambient temperatures present increased risks for miscarriages and infant mortality in pregnant individuals, lack of access to proper reproductive health care and services due to climate change is only making matters worse. Climate change is accelerating at an unprecedented rate, with individuals in humanitarian settings bearing the brunt of the devastating effects. With miscarriage and infant mortality rates continuously on the rise, it is crucial to evaluate the role that climate change has in fertility.

◆ **Poster 53** ◆

From Small Fry to Big Fish: How developmental morphology can define a species.

Presented By: Ian Hipp

Supported By: Dr. Yoel E. Stuart, Biology; Dr. Caleb McMahan, Field Museum of Natural History

Central American cichlid fish present a puzzle to evolutionary biologists: how do we define a species, especially when they are still hybridizing? Throughout the lifespan of cichlids, they develop a distinct morphology going from almost indistinguishable juveniles to identifiable adults. Our Summer 2023 CURE course set out to map the timing of these differences across 23 cichlid species from Guatemala. As a team, we discovered that this variation appears early on, such that juvenile fish are already displaying the diversity we see in adults.

◆ **Poster 54** ◆

What Science Communicators Can Learn from Improvised Storytellers

Presented By: Katherine Hogenson

Supported By: Dr. Hans Svebakken, Theology

Improv is known for its “Yes and” policy but equally important, if less well known, is “No but” and knowing when to say it. Both phrases allow for collaboration to work smoothly as the stakes rise and the audience sits enraptured. “Yes and” allows the story to stay fun, engaging, and flexible while “No but” maintains important rules of the built world. As scientists find themselves competing with a quick media environment, a volatile public attitude, and growing conspiracy movements, improvised storytelling may hold lessons for de-escalation and engaging world building that can help bring in new learners who previously felt alienated.

This project will look at cancel culture among other reasons why some feel alienated or cut off from the scientific consensus. Additionally, instances of creative scientific story telling will be considered for how they promote engagement in science. Lastly, these findings will be used to examine if methods seen in improvised comedy and storytelling could be used to bring in those who feel estranged from science by creating a compelling story of science that both maintains its rules while being flexible enough to meet anti-science ideas and questions where they are.

◆ **Poster 55** ◆

Mealworms as an Opportunity for Food Sovereignty and Self-Sustainability

Presented By: Michael Hughey

Supported By: Dr. Sarah Ku, School of Environmental Sustainability

Current levels of agricultural production can feed the world’s population, but dispersion methods prevent equitable food access. Edible insect cultivation poses a sustainable alternative addressing each facet of food sovereignty: access to enough, nutritious, and culturally significant food. With over 2,000 known edible species, insect cultivation maximizes space efficiency, water availability, nutrition, and consumer access. This research focuses on the US market to examine its business capacity for this sustainable food source. We apply ecological frameworks of resilience and adaptive theory to offer insights on how businesses can leverage resources and constraints in modern contexts to address food sovereignty.

◆ **Poster 56** ◆

Litter analysis and quantification to implement restoration efforts and legal policy changes for the Chicago River

Presented By: Caitlin Hyatt

Supported By: Dr. Timothy Hoellein, Biology

This poster will outline my research, which is concerned with addressing environmental and public health concerns in the Chicago ecosystem by pulling litter from the Chicago River in order to analyze and quantify anthropogenic debris that pollute our urban water ways. In order to analyze the debris pulled from the river, I traveled to downtown Chicago to collect the debris, and analyzed the composition of the debris. This poster will present my data over the fall of 2023, which will show the trends of anthropogenic debris and human behavior as it pertains to waste disposal in Chicago’s downtown ecosystem.

◆ Poster 57 ◆

Anxiety and Depressive Symptoms Prior to Menarche: The Role of Sleep and Physical Activity

Presented By: Katherine Jabaay; Provost Fellowship

Supported By: Dr. Amy Bohnert, Psychology; Hannah Hagy, Psychology; Juliana Adornetti; Dr. Stephanie J. Crowley, Rush University; Dr. Frank F. Tu, NorthShore University Health System; Dr. Kevin Hellman, NorthShore University Health System

Although research has shown that female adolescents experience increased anxiety and depression symptoms following menarche, there is limited evidence in the months leading up to menarche and even less attention paid to behavioral effects on this transition. This study examines pubertal status, anxiety symptoms, depressive symptoms, physical activity, and sleep health in 120 premenarchal, biological females. This study addresses: (1) the association between pubertal status, anxiety and depressive symptoms among female adolescents in the months leading up to menarche, and (2) considers the role of modifiable actions such as sleep health and physical activity on these symptoms.

◆ Poster 58 ◆

Diet Reconstruction of El Sidrón Neandertals Using ART, an Experimental Approach

Presented By: Hannah Jaghab; Mulcahy Scholars Program

Supported By: Dr. Kristin L. Krueger, Anthropology

The study aims to experimentally examine the diet of the El Sidrón Neandertals. Previous dental microwear research suggests these individuals relied on *Physcomitrella patens* (forest moss), *Schizophyllum commune* (split-gill mushrooms), and *Pinus koraiensis* (pine nuts); however, the formation processes of microwear have been recently debated. Due to the lack of meat found in the calculus, it has been suggested that these ancestors were vegetarian. This experiment will create dental microwear using Artificial Resynthesis Technology using the foods aforementioned, shedding light on both the formation processes of microwear and the diet of these hominins.

◆ Poster 59 ◆

Analysis of Catalytic Efficiency, Thermostability, and Protein Expression of the β -glucosidase (BglB) Enzyme Containing A88E Mutation in Comparison to Wild Type to Improve the Understanding of Mutational Effects on Protein Function

Presented By: Pearl Jaroonwanichkul, Jade Sawrey

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

We hypothesize that β -glucosidase (BglB) mutant A88E will demonstrate increased catalytic efficiency (kcat/KM) and equal protein expression in comparison to the wild type because its overall Foldit score suggests a high likelihood of expression, and the mutation increases the protein's ability to form hydrophilic interactions in an aqueous environment due to a change from a hydrophobic residue to a hydrophilic residue while not changing interactions between amino acid residues.

◆ Poster 60 ◆

Molecular Model of Calmodulin Dependent nNOS Activation and Its Dynamic Molecular Behavior

Presented By: Aaron Juco

Supported By: Dr. Pete Kekenes-Huskey, Cell and Molecular Physiology

neuronal Nitric Oxide Synthase, or nNOS, is a protein that is essential to key physiological and pathological processes, such as central regulation of blood pressure, smooth muscle relaxation, and synaptic plasticity in the central nervous system. The homodimeric enzymatic activity of nNOS is regulated by the activation of Ca²⁺ in calmodulin (CaM), a cytosolic binding protein. Previous literature suggests that calmodulin binds to two domains of nNOS, but its exact protein interactions and how it executes its switch function remains relatively unknown. That is why in this study, a preliminary molecular model of CaM dependent nNOS is modeled through observing the behavior of homologous proteins and performing protein-protein docking based on residues of oxygenase and CaM binding regions of nNOS. After obtaining the model, molecular dynamic simulations are performed to better understand the behavior of this protein complex.

◆ Poster 61 ◆

Not All Who Regurgitate Have GERD?!?!

Presented By: Paul Kalapala,

Supported By: Dr. Promila Banerjee, Edward Hines, Jr. Veterans Affairs Hospital

For individuals with regurgitation symptoms, they might typically be diagnosed with gastro-esophageal reflux disease (GERD). In this report, a patient with intermittent reflux and regurgitation was diagnosed with dyspepsia and GERD. However, an endoscopy revealed that they had a gastric volvulus requiring surgery. This demonstrates that regurgitation symptoms do not necessarily indicate dyspepsia or GERD. One must also consider the patient's altered anatomy and medical history to determine if a condition like Gastric Volvulus could be the cause.

◆ Poster 62 ◆

Attitudes on Abortion and Maternal Health Care in Cook County

Presented By: Skylar Kanine; Interdisciplinary Research Fellowship

Supported By: Dr. Dana Garbarski, Sociology

With the overturning of Dobbs in the summer of 2022, abortion has become a heavily debated topic across the United States. Using the data collected in the Cook County Community Survey Project, I will examine the attitudes of Cook County residents pertaining to abortion services and maternal health care. The aim of this presentation is to shed light on the symbiotic relationship between abortion and maternal health care.

◆ Poster 63 ◆

Designing an Artificial Coral Reef

Presented By: Arivu Kapoor, Grant Steiner

Supported By: Dr. Colin Gates, Chemistry and Biochemistry

Coral reefs, Earth's most biodiverse ecosystems, face unprecedented environmental stress due to increasing ocean acidification. This research project explores Engineered Living Reefs (ELRs) utilizing 3D-printed coral structures and filamentous cyanobacteria. The methodology employs an array of tests to assess photosynthetic health. Results indicate efficient polysaccharide production, a promising result for the future viability of ELR structures. Further investigations are necessary to understand how ELR structures respond to environmental stressors. This research advances the scientific understanding of exopolysaccharides produced by cyanobacteria ELR structures. The findings underscore the imperative of nature-based solutions in response to the rapid degradation of these vital ecosystems.

◆ **Poster 64** ◆

Privacy Preserving Facial Recognition

Presented By: Demetrius Karris

Supported By: Dr. Nicholas D. Soulakis, Health Science and Public Health

The system demonstration presents a streamlined approach to facial recognition that prioritizes privacy while encouraging community engagement. By leveraging Cloud-based architecture and API integration, we aim to minimize data collection while maximizing participation in community engagement events. This system addresses key challenges in privacy preserving facial recognition technology within public health promotion and education. As of March 18th, the system is in the laboratory function phase – helping us understand how to better assist with health promotion in communities.

◆ **Poster 65** ◆

Thrombolysis with tPA in Flow model

Presented By: Varshika Karthi

Supported By: Dr. Erin Hayes, Biology; Dr. Ramanathan Kadirvel, Mayo Clinic; Dr. Arul Santhosh, Mayo Clinic; Dr. Waleed Brinjinkji, Mayo Clinic; Aditi Krishnan

Tissue plasminogen activator (tPA) is a common pharmaceutical drug used to treat the first onset symptoms of acute ischemic stroke patients. tPA can be used to decrease the risk of bleeding and not let the effects of a stroke be as detrimental without the use of tPA. This experiment aimed to see the percent lysis of different types of blood clots with tPA to see which clots tPA is the most effective with. The flow model uses pressure that represents the physiological conditions of the human body whereas the static doesn't as it is standstill.

◆ **Poster 66** ◆

Cook County Community Survey: Perceptions of Institutional Trust

Presented By: Elieza Katzman-Jacobson; Interdisciplinary Research Fellowship

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

This presentation will examine perceptions of institutional trust among Cook County residents and analyze the ways in which that perception varies across socio-demographics. Following the 2021 and 2022 waves, the 2023 survey was developed by students and faculty within Loyola's Sociology and Political Science departments over the course of the 2023 Fall semester. We are analyzing perceptions of trust of local institutions and national institutions. These studies may help measure trustworthiness of respondents - a trait valuable within social trust - as well as the institutions themselves.

◆ **Poster 67** ◆

Bilinguals Learning from Video Instruction

Presented By: Jennifer Kavina; Mulcahy Scholars Program

Supported By: Dr. Elizabeth Wakefield, Psychology

This presentation will discuss the effects of learning from video instruction for bilingual adults based on movement. Gesture has been found to enhance learning, especially for bilingual students. My study focuses on different gesture representations and how it affects bilingual adults' memory, retention, and recall.

◆ **Poster 68** ◆

Trabecular development in the growth series of the early tetrapod *Ossinodus* with implications for the water-to-land transition.

Presented By: Natalie Kaytor

Supported By: Dr. Megan Whitney, Biology

Nearly 350 million years ago, early tetrapods made a critical transition from living in water to living on land. How this transition happened remains relatively unknown in vertebrate evolution. To better understand how early tetrapods may have spent time on land during their lifetimes, I examined a growth series of femora from an early Australian tetrapod, *Ossinodus*. My preliminary results indicate that trabecular bone varies between the life stages of *Ossinodus*. The implication of this difference may reveal that this early tetrapod spent different parts of its life in water and on land.

◆ **Poster 69** ◆

Characterization of Oxygen Evolution From Rh(111)

Presented By: Allison Kerr; Mulcahy Scholars Program

Supported By: Dr. Dan Killelea, Chemistry and Biochemistry; Maxwell Gillum, Chemistry and Biochemistry

Due to the importance of oxide surfaces in heterogeneously catalyzed oxidation reactions, it is necessary to gain a fundamental understanding of the behavior of oxygen on transition metal surfaces. Using Reflection Adsorption Infrared Spectroscopy (RAIRS) and Temperature Programmed Desorption (TPD), the way that a catalyzed reaction proceeds can be studied in real time as the reaction proceeds. By using a metal (Rh-(111)) and a reaction (CO oxidation) that are well understood, variables can be accounted for, providing even more valuable data.

◆ **Poster 70** ◆

Investigating Sub Religions in Hinduism

Presented By: Abhinav Kodukula, Sravan Sunkara

We will be discussing a religious site that we visited and interacted with and explain the nuances of the religion as well as practices and information about what the religion is.

◆ **Poster 71** ◆

Fluorescence Spectroscopy Analysis of Phospholipids Bound to Bovine Serum Albumin

Presented By: Daria Kozuch, Daria Kozuch, Jennifer Kamwo Feussi

Supported By: Aryana Sayeed, Chemistry and Biochemistry; Dr. Manisha Ray, Chemistry and Biochemistry

Our research focuses on studying the interaction between bovine serum albumin (BSA), a protein, and phospholipids, LPC, LPS, DOPS, and DOTAP at varying concentrations. We utilize fluorescence spectroscopy to observe the quenching of the tryptophan residues in BSA, allowing us to explore the lipid binding sites in BSA. Through experimental studies, we determine the binding dissociation constant (K_d) and the number of fluorescent binding sites for lipids (n). Our findings provide insights into how different phospholipids, based on their structure, bind to BSA. Understanding these interactions can be used to further study various phospholipids using CIR to understand their molecular interactions with carrier proteins.

◆ **Poster 72** ◆

The Other-Race Effect (ORE) in 9- and 12-Month Old Underrepresented Minority Infants

Presented By: Milosz Krzewinski; Provost Fellowship

Supported By: Dr. Margaret Guy, Psychology

This study is designed to determine how exposure to faces of different races influences infants' face processing at 9 to 12 months of age. We are frequently exposed to different race faces in our daily lives, and this study is being conducted to add to our understanding of whether this type of face exposure may lead to deeper processing of the face itself.

◆ Poster 73 ◆

Charting the Ethical Landscape of Investigating Early Genetic Screening for Late-Onset Conditions

Presented By: Konrad Kutrzuba, Marco Peters, Chris Nasios, Cole Gebert

Supported By: Dr. Jennifer Parks, Philosophy; Dr. Dawn Franks, Biology

Early genetic screening introduces a critical ethical discourse in the realm of neurodegenerative diseases. The e4 variant of the APOE gene, for example, increases susceptibility to late-onset Alzheimer's disease, a progressive neurological condition characterized by cognitive decline and debilitating symptoms. Concurrently, Huntington's disease, marked by a relentless degenerative process, presents a complex interplay of motor, cognitive, and emotional impairments. Delving into early screening holds promise for proactive disease management, yet confronts individuals with profound existential dilemmas. This exploration navigates the complexities of disease management and existential self-knowing, advocating for informed decision-making through the evolving landscape of genetic medicine.

◆ Poster 74 ◆

Polygenic Risk Scores in the Context of Genetic Counseling: A Focus on Obesity

Presented By: Jacqueline Les

Supported By: Dr. James Cheverud, Biology

This paper analyzes quantitative trait loci associated with diabetes and importance in genetic counseling. Obesity phenotype variations caused by gene-environment interactions are analyzed using a *mus musculus* model. Glucose and insulin levels of F34/F16 mice were compared after administering high/low fat diets to determine the probability of diabetes occurrence based on additive/dominance genetic effects. Single loci analyses based on sex, diet, and genomic locations determined that genetic impact on obesity phenotype variation is dependent on sex and dietary environment, marking the genetic counseling field and highlighting disease complexity, personalizing risk assessment and genetic testing, and enabling early intervention for patients.

◆ Poster 75 ◆

Exploring the Dynamics of Auditory Ribbon Synapse Development and Dysfunction using the mScarlet-I-RIBEYE Mouse Line

Presented By: Gabriela Licwinko, Christopher Nasios, Cole Gebert; Mulcahy Scholars Program

Supported By: Dr. Wei-Ming Yu, Biology

Ribbon synapses, pivotal in linking auditory hair cells with spiral ganglion neurons, remain poorly understood in cochlear synaptopathy. To bridge this gap, we developed the mScarlet-I-RIBEYE mouse line, tagging RIBEYE protein with mScarlet-I for fluorescence. Validating its utility, we observed red fluorescence in cochlear and retinal ribbon synapses, affirming normal synapse number and hearing in these mice. Utilizing this model, we aim to study dynamic events in ribbon synapse development and degeneration post-noise exposure, advancing our comprehension of cochlear synaptopathy.

◆ Poster 76 ◆

Zen Buddhist Temple

Presented By: Li Livdahl, Razina Ahmed, Meghan Economos, Chris Muller, Kayla Quigley, Emmie Roberts

This presentation and poster will go over our unique and shared experiences going to the Zen Buddhist Temple here in Chicago. We will conduct interviews and share our first-hand encounters with this Temple and the Buddhist religion.

◆ Poster 77 ◆

Hamiltonian Cycles of Modular Origami Nets

Presented By: Anurathi Madasi; Provost Fellowship

Supported By: Dr. Eric Chang, Mathematics and Statistics

We found the Hamiltonian cycles of the origami nets of a 30, 36, 90, and 120-piece model. We used Tom Hull's origami units, called "Phizz units" to construct models following one of the Hamiltonian cycles. Curvature is an integral part of constructing origami models. Different shapes result in different geometries. Additionally, there are 3-coloring patterns that can be built off of the Hamiltonian cycles, which are demonstrated in the models. The goal of my project was to understand these colorings and explore how many unique Hamiltonians I could map for each unit.

◆ Poster 78 ◆

Development of Near-Infrared Molecules for pH Sensing

Presented By: Anthony Maltese, Michelle Ferek

Supported By: Dr. Tatiana Esipova, Chemistry and Biochemistry; Sara Abuhadba, Chemistry and Biochemistry

In recent years, significant attention has been directed towards designing organic chromophores with sensing capabilities that absorb and emit light in the near-infrared (NIR) region. Herein, we report the synthesis and photophysical properties of meso-diethylamino substituted dibenzo-BODIPY dyes with varying structural modifications. The aim of this study was to investigate the effect of the sensor's design on the process of electron transfer. Overall, these (D-A) dibenzo-BODIPY compounds hold the potential to become fluorescent pH sensors in the red spectral range that operate through the photoinduced electron transfer (PeT) mechanism.

◆ Poster 79 ◆

Navigating Consumer Choices: Understanding Information Overload and Brand Perception through UX Biometrics

Presented By: Sofia Martinez de Arredondo Mil, Ryan Love, Anne Price

Supported By: Dr. Dinko Bačić, Business

This presentation explores the complexities of consumer decision-making under cognitive pressure, in keeping with the Theory of Bounded Rationality. The presentation is intended to improve the understanding surrounding product positioning in the context of existing barriers to entry related to brand perception. Over the course of the 2024 Spring semester, we worked in a group of three students, experimenting with eye-tracking and skin response devices to measure visual attention, effort, and emotional responses during information presentation. Finally, we were able to gather participants to engage in a product differentiation task followed by a brief assessment related to the participants' product preferences after viewing the information. Through this experience, we were able to deepen our understanding of consumer behavior and provide guidance related to the barriers to entry that new firms face in industries with firms that have well-established public profiles.

◆ Poster 80 ◆

Design and Deployment of Two-Dimensional Chiral Surfaces for Enantiospecific Chemical Reactions

Presented By: Afia Mehjabin

Supported By: Dr. Mausumi Mahapatra, Chemistry and Biochemistry

This poster will focus on the design and deployment of two-dimensional chiral surfaces, which can be tuned to perform essential chemical reactions with very high enantiospecificity. We will demonstrate the fundamental aspects through which chirality is introduced to metal oxide surfaces via the adsorption of chiral molecules. With a particular emphasis, this poster will cover both background literature and our proposed study to synthesize amino acid-modified copper oxide surfaces with atomic-scale precision. Chirality is ubiquitous in nature, and understanding surface chirality will provide fundamental insights into various industrial processes, especially those related to chiral pharmaceuticals.

◆ Poster 81 ◆

Characterizing The BglB L108E Mutation on BglB Protein to Determine its Effects on Catalytic Efficiency.

Presented By: Valeria Mendoza, Isabella Reyes

Supported By: Dr. Emma Feeney, Biology

I hypothesize that BglB mutant L108E will demonstrate the same catalytic efficiency and thermal stability in comparison to the wild type because its overall Foldit score suggests a high likelihood of expression, and intermolecular modeling analysis also points to normal local interactions. Even though the amino acid would change from being hydrophobic to hydrophilic, it occurred far from the catalytic site, rendering no significant change to the enzyme's overall activity.

◆ Poster 82 ◆

Gesture's Impact on Learning for Individuals with ADHD

Presented By: Chloe Michel; Mulcahy Scholars Program

Supported By: Dr. Elizabeth Wakefield, Psychology

In general, gestures while teaching can support learning and benefit students. However, little is known about the impact that gestured instruction has on students with ADHD. In this study, participants watched three recorded lectures incorporating no gesture, representational gesture or beat gesture while their visual attention was monitored. Then, their understanding of lecture material was tested, and they completed working memory tasks. Data will be analyzed to determine whether gesture facilitates learning for students diagnosed with ADHD and visual attention and working memory measures may inform us on how and why gesture has its effects.

◆ Poster 83 ◆

Neotropical Navigators: Mapping Habitat Utilization of Migratory Birds Wintering in Belize

Presented By: Kyleigh Miklos

Supported By: Rev. Stephen Mitten, S.J., School of Environmental Sustainability

Many species of migratory birds fly thousands of miles South annually to reach their wintering grounds. Belize's neotropical ecosystems host a large variety of these species during the harsh winter months in Northern America. The goal of this project is to analyze how neotropical migratory birds utilize different types of habitats through the use of eBird citizen science data and GIS techniques. This research aims to further understandings of habitat utilization patterns in migratory bird species and to promote the conservation of these critical ecosystems.

◆ Poster 84 ◆

Investigate the Role of Ephrin-B2 and EphA7 in Frequency Map Formation in the Cochlear Nucleus

Presented By: Joshua Morcos, Carina Kalkman; Mulcahy Scholars Program

Supported By: Dr. Wei-Ming Yu, Biology

Cochlea's spiral ganglion neurons (SGNs) transmit sound to the cochlear nucleus, forming a frequency map based on sound responses. Previous studies suggest Ephs and ephrins guide axons in sensory systems, leading us to investigate their role. Ephrin-B2 and EphA7 expression along the cochlear nucleus axis and in developing SGNs respectively implies their involvement in frequency mapping. Ephrin-B2 influences auditory nerve fiber trajectory. Absence of ephrin-B2 and EphA7 in mice reduces frequency band precision. Our findings suggest ephrin-B2 and EphA7 signals regulate frequency mapping in the auditory system

◆ Poster 85 ◆

Vertical Stratification of Avian Species in Madre de Dios

Presented By: Piper Morris, Jessica, Zarosl, Ava Sohr

Supported By: Rev. Stephen Mitten, S.J., School of Environmental Sustainability; Dr. Christopher Peterson, School of Environmental Sustainability; Noe and Jay, Inkaterra Field Guides

The Madre de Dios region is known to have the largest Peruvian bird count, hosting 547 different avian species. Over a week-long period at Inkaterra Amazon Field Station, our group was able to research and record the vertical stratification of over 180 avian species in the Peruvian Amazon Rain Forest. During our research, we utilized citizen science applications, such as Merlin and eBird to identify different species by calls and songs. The purpose of this project is to engage the local community and educate individuals on the niche differentiation and abundance of bird species within a constrained range.

◆ Poster 87 ◆

Theoretical, Experimental, and Analytical Approach to Bglb Y188F Mutant Enzyme and its Functions

Presented By: Alejandra Nevarez, Will Lee, Madeline Nelis

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

Our semester-long primary research involved generating the Y118F mutant enzyme via theoretical means and characterizing its biochemical functions experimentally and analytically. We first used Foldit standalone to model the mutant enzyme. Then, we utilized various laboratory means to produce and purify the protein. Finally, we analyzed the thermostability and kinetic functions of the protein. Mutant design of Y118F is a part of a larger research project aimed at generating a dataset for the Seigel lab's artificial intelligence learning. The goal is to provide AI with data to predict protein functions based on amino acid sequence and/or protein structure.

◆ Poster 88 ◆

Flute Acoustics

Presented By: Amanda Newton,

Supported By: Dr. Gordon P Ramsey, Physics

Acoustics is a branch of physics that entails how the physical properties of an object or space impact the properties of sound waves. This is particularly important for musical instruments, where the way the musicians produce sound waves, in combination with physical design of the instrument, impacts the tone quality and timbre of the sound. Flutes are an understudied instrument in acoustics, so studying the way sound is produced through various instruments in the flute family can inform the construction and playing of flutes.

◆ **Poster 89** ◆

Cotton as a Model Substrate for the Analysis of Microbes in Streams

Presented By: Cynthia Nguyen; Mulcahy Scholars Program

Supported By: Dr. John Kelly, Biology

Streams and vital ecosystems globally face severe contamination from human activities such as agriculture and urbanization. Research, predominately from North America and Europe, highlights these impacts, particularly in the Global South biomes. Microorganisms who are pivotal in stream food webs are adversely affected by these stressors. The issue is, the universality of microbial responses to land-use changes remains unstudied. The Kelly Lab at Loyola University Chicago collaborated to develop and standardized cotton strip-based method for analyzing stream microbial communities. To validate, we compare microbial growth on cotton strips and leaves from various tree species using DNA sequencing.

◆ **Poster 90** ◆

The Recreational Value of Birding and Sandhill Crane Abundance

Presented By: Alexander Nielsen

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

Our research identifies the link between values and species richness and abundance of sandhill cranes, which migrates each year through our birding area. Sandhill crane stopovers at state and federal wildlife areas attract large numbers of birders. Although spending associated with birding and sandhill crane viewing can provide some indication of economic importance, viewing areas provide a non-market value over and above birding expenditures. We estimate this nonmarket value using the zonal travel cost method and data from the eBird project on wildlife areas in Indiana. We find, on average, birders are willing to pay \$52 per trip to sites in the study area, about \$1 per trip to see an additional species, and 0.26 cents per trip for 10% more cranes.

◆ **Poster 91** ◆

Graphic Images on Social Media: Heartwrenching or Horrifying

Presented By: Marisa Panella

Supported By: Dr. Pamela Morris, Communication

This study is intended to explore the effects of graphic image use within the sphere of social media advocacy. It is significant due to its relevancy surrounding current events and it's interaction with the surplus of social media users. Social media advocacy is consistently being utilized beyond this current conflict and this study aims to discover if the intent behind these social media posts is being matched by its impacts.

◆ **Poster 92** ◆

How Gesture Learning is Impacted by Individual Differences in Adults

Presented By: Aashi Patel

Supported By: Dr. Elizabeth Wakefield, Psychology

Gestures are classified as the hand movements made alongside speech. Previous research has confirmed that incorporating gesture can benefit learning for both children and adults. However, these studies revealed that not all individuals benefit in the same way. In this study, we are investigating how individual differences affect one's likelihood to benefit from gesture. The individual differences we are focusing on include visuospatial working memory, verbal working memory, and spontaneous gesture rate. In particular, we want to see how these variations relate to one's ability to learn mathematical equivalence through gesture learning.

◆ Poster 93 ◆

The Effects of oxaliplatin, cisplatin, capecitabine, 5-fluorouracil, and cyclophosphamide on the Human Gut Microbiome

Presented By: Kush Patel

Supported By: Dr. Michael Burns, Biology

The goal of this study is to observe the effects of five chemotherapy drugs—namely oxaliplatin, cisplatin, capecitabine, 5-fluorouracil, and cyclophosphamide—on samples of the human gut microbiota to determine their effects.

◆ Poster 94 ◆

Ethics of Preemptive Reproductive Technologies

Presented By: Cameron Pham, Malik Khan, Annie Lim, Jose Perez

"When will this level of selection be considered eugenics?" It's the big question nowadays, as gamete donation or pre-implantation genetic testing are becoming more popular in usage for parents looking to potentially select genotypes for their child. Technology like these can help parents to select for and against certain genotypes, from avoiding diseases and illnesses to the race of their child (in the case of gamete donation). However, as these advancements occur, the line between what should be ethically allowed to be selected for becomes increasingly blurred. Looks, the difference between life-threatening v. non-life threatening conditions, and IQ--these are aspects of individuals that can now be selected for. Our group will dive deeper into preemptive reproductive technologies and the discussion of eugenics surrounding the topic.

◆ Poster 95 ◆

Confronting Cruelty: Ethical Insights into the Treatment of Model Organisms in Contemporary Research

Presented By: Marcus Piattoni, Isabella Gates. Alexis Rossi; John Grant Fellowship for Research in Bioethics

Supported By: Dr. Jennifer Parks, Philosophy

This research seeks to investigate the ethical treatment of model organisms within recent scientific studies, focusing on Zebra Finches, Cotton Rats, Zebra Fish, African Clawed Frogs, and Rhesus Monkeys. Using the "Web of Science" database, articles concerning each model organism were reviewed to assess the quality of treatment afforded to each species. Special attention was given to inter-species differences, evaluating how the discussions on research subject treatment differed between species. Ensuring ethical treatment of all animal subjects in medical research is critical for maintaining the integrity and efficacy of scientific research.

◆ Poster 96 ◆

Development of tissue specific reporter transposons in Zebrafish

Presented By: Fred Pickett, Pedro Henrique Assenza Tavares Coroa, Lex Busch, Kevin Mendoza, Liam More O'Ferrall, Josh Henley, Tony Uriostegui, Laura Aleksonis, Sophia Saylor,

Ani Smart, Greta Acas, Taylor Stenzel, Paula Martin, F. Bryan, Pickett; Mulcahy Scholars Program

Supported By: Dr. Paula R. Martin; Dr. F. Bryan Pickett, Biology

The origin of cells and tissues in the fish fin in the early zebrafish embryo is unknown. Mini-genes are being constructed to help us tag the mother cells in the early embryo whose daughter cells will become the bone, nerve and vascular tissue in the mature fish tail. We are characterizing gene regulatory regions that will activate fluorescent protein synthesis in diverse tissues, and will assemble mini-genes using the Gateway cloning system (Thermo Fisher Scientific). This poster will outline our design and engineering of these constructs.

◆ **Poster 97** ◆

Circadian Clock Control of Drosophila Feeding and Activity Rhythms is Downstream of the Central Circadian Clock Network

Presented By: Liliya-Mariya Pireva, Rabab Mirza; Biology Summer Research Fellowship; Mulcahy Scholars Program

Supported By: Dr. Daniel Cavanaugh, Biology

The existence of the circadian system allows for certain human and animal behaviors to exhibit ~24 hour oscillating rhythms. These rhythms are supported by a molecular circadian clock inside brain clock neurons. We aim to determine where the molecular pathways underlying feeding:fasting and rest:activity rhythms diverge within the Drosophila brain. We find that mutations in the Dh44-R1 receptor decrease activity rhythms but leave feeding rhythms intact, proposing that these two behaviors diverge downstream of the clock network.

◆ **Poster 98** ◆

Synthesis of Ubiquinone Analogs to Inhibit Na⁺-NQR for Antibiotic Treatment

Presented By: Sophia Pittman; Mulcahy Scholars Program

Supported By: Dr. Daniel Becker, Chemistry and Biochemistry; Zachary Liveris, Chemistry and Biochemistry

The emergence of bacterial strains with drug-resistance to current antibiotics hinders medical treatment of bacterial infections. Sodium-Dependent NADH: Ubiquinone Oxidoreductase (Na⁺-NQR) functions as an ion transporter, provides energy, and is involved in homeostasis maintenance for numerous pathogenic bacteria including *Vibrio cholerae*. Due to Na⁺-NQR's vital role in bacterial cell functions and absence in human cells, Na⁺-NQR is an ideal target for novel antibiotics. Ubiquinone Analogs (UQA) have been shown to inhibit Na⁺-NQR in *V. cholerae* and other bacteria. UQA are synthesized and characterized to identify and optimize drugs targeting Na⁺-NQR with minimal toxicity to humans and maximum bacterial inhibition efficacy.

◆ **Poster 99** ◆

Airbus Stock Pitch - Patrick Provost

Presented By: Patrick Provost

Supported By: Dr. Steven Todd, Business

Investment research report on Airbus.

◆ **Poster 100** ◆

Top-Down or Bottom-Up: An Analysis of Policies Affecting Homelessness in Buenos Aires

Presented By: Jacob Pursell; Provost Fellowship

Supported By: Dr. Patrick Cunha Silva, Political Science

Since the 1994 Argentine constitution, policy measures – whether addressing homelessness or not – have affected the street population of Buenos Aires. This paper distinguishes these policies as top-down (created and implemented by high levels of government) or bottom-up (created and implemented by communities). After consulting the literature’s preference for bottom-up homelessness policies, I analyze both policy strategies in Buenos Aires. When asking why policies adopt a strategy, I consider the policy’s intended implementation speed, distributive nature, and primary focus. I determine that the negative effects of top-down homelessness policies in Buenos Aires imply that policymakers should primarily adopt bottom-up homelessness policies.

◆ **Poster 101** ◆

Visiting a Buddhist Temple

Presented By: Isela Quinones, Safa Khatoon, Kate Humphreys

Supported By: Dr. Yarina Liston, Theology

This presentation will follow our experience of visiting one of the oldest Buddhist Temples here in Chicago. Through research, an in person visit, as well as interviews with visitors and leaders, we were able to broaden our knowledge and understanding of not only Buddhism as a tradition, but also a deeper appreciation of other cultures. Throughout our theology course, we learned much about the historical and doctrinal aspects of this tradition, but we were able to see a living, breathing reality through this visit.

◆ **Poster 102** ◆

Honda Motor Company Investment Analysis

Presented By: Raymond Gerard Raad Armendariz

Supported By: Dr. Steven Todd, Business

This presentation will describe and explain many features of one of the largest automotive companies in the world. Including a description of the business, financial analysis, industry analysis, valuation models, investment risks and an investment thesis that will argue why investors should buy Honda shares. In other words, this is an investment pitch trade idea. Taking this course has been important for my career because I have learned a lot about investment banking and asset management.

◆ **Poster 103** ◆

Patterns of Context-dependent Global Change in Agroecology and Marine Neritic and Benthic Ecosystems - A Systematic Review

Presented By: Jasmine Ramiscal, Sophia Martin; School of Environmental Sustainability (SES) Undergraduate Research Fellowship

Supported By: Dr. Marlene Brito-Millán, School of Environmental Sustainability

Global change impacts diverse ecosystems in ways that can be context-dependent, where ecological relationships depend on context. Despite independent studies capturing context-dependent impacts, a global understanding of patterns of context-dependence is lacking. As part of a wider effort by the Women of Color in Ecology and Evolutionary Biology (WOCinEEB) Global-Change subgroup, we report on an ongoing systematic literature review that examines context-dependent effects of global change, such as climate-change and biodiversity loss, within marine (66 articles) and agroecological ecosystems (71 articles). We aim to systematize data to

uncover geographic patterns, stressor-specific impacts, and degree of context dependence across different ecosystems.

◆ **Poster 104** ◆

Characterization of Enzyme Function After Proline to Leucine Amino Acid Mutation at Location 41 in β -Glucosidase Enzyme

Presented By: Gabriella Rant, Skyler Yates-Johnson

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

We hypothesized that our mutant enzyme BglB(P41L) will demonstrate slightly decreased catalytic efficiency and decreased thermal stability in comparison to the wild type protein. Using Foldit to score the protein suggests an acceptable likelihood of expression, with an increased total energy of 2.921 units. This energy increase also suggests that the protein will be slightly less stable and therefore slightly less active. In order to test our hypothesis, kinetic and thermostability assays were run to determine the function of the enzyme post-mutation. This characterization will allow for further overall understanding of the enzyme BglB.

◆ **Poster 105** ◆

Understanding the Practice of Buddhism in the Chicagoland Area

Presented By: John Ratz, Kayla Quigley

Supported By: Dr. Yarina Liston, Theology Department

This presentation reflects on our experiences visiting Buddhist sites in Chicago to understand better how Buddhism is practiced. Throughout our semester in Theo 299 Religions of Asia, we have been learning about the beliefs of different religions originating in Asia including Buddhism. The purpose of this project is to have first-hand experiences observing these beliefs through practice and rituals. The sites observed were the Buddhist Temple of Chicago and Chicago Karma Thegsum Chöling. Through this experience, we developed a deeper understanding of the importance of religious practice in Chicago.

◆ **Poster 106** ◆

Family Matters: How Self-compassion and Shame Influence Family Stigma & Blame in Families of Substance Users

Presented By: Kaia Reynolds, Clara Tebbe; Provost Fellowship

Supported By: Dr. Tracey DeHart, Psychology; Kennedy Hoying, Psychology

Family stigma can hurt the recovery of those struggling with substance use disorders. However, we expect that relatives who have high self-compassion will have a weaker relationship between family stigma and blame attributions towards their family member than that of individuals who are low in self-compassion. We also expect that relatives of substance users high in perceived shame will report more blame attributions towards their family member than those low in perceived shame. Two hundred and twenty five family members of chronic substance users were recruited through a Reddit support group and asked to report experiences concerning these variables.

◆ **Poster 107** ◆

Evaluating the impacts of invasive cattail and European frog-bit on northern wild rice (*Zizania palustris*) growth and germination

Presented By: Alexandra Risdal

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

Zizania palustris, northern wild rice, is an important plant for the ecology of Great Lakes coastal wetlands (GLCWs) and the culture of Anishinaabe tribes. Wetland dredging and human development severely limited its native range, however, and the ongoing invasion of *Typha × glauca* (hybrid cattail) and *Hydrocharis morsus-ranae* (European frog-bit) may further threaten surviving populations. Few studies exist to verify effects of these invasives on *Z. palustris*, although some mechanisms have been proposed: namely, the litter accumulation of *Typha* and the shading effect of floating *Hydrocharis* mats. This study addresses this through a fully factorial experiment mimicking the effects of litter and shade on the germination and development of *Z. palustris* seedlings. Results will determine the impact of light cover and/or litter accumulation on *Z. palustris* germination and growth, which will inform land management strategies for protecting and growing native populations.

◆ **Poster 108** ◆

The Strongly Interacting Massive Particle Paradigm

Presented By: Andrew Rogers; Mulcahy Scholars Program

Supported By: Dr. Walter Tangarife, Physics

One hypothesis for dark matter's identity is that it is a cold thermal relic from the early universe. Strongly Interacting Massive Particles are follow a model that fits this hypothesis through strong self interactions, and weak interactions with standard model particles. The model is based on various interaction and annihilation processes, but this project focuses specifically on the 3-to-2 annihilation process. This process involves the transformation of 2 dark matter particles and a standard model particle into a dark matter particle and a standard model particle and is essential for the freeze out process.

◆ **Poster 109** ◆

The Relationship Between Intelligence and Creativity: Is Open Mindedness the Missing Link?

Presented By: Emily Rokos; Mulcahy Scholars Program; Provost Fellowship

Supported By: Dr. Robert Morrison, Psychology

Creativity allows people to produce new and unique ideas in a variety of different fields (Runco, 2012). Previous studies indicate a positive relationship between creativity and intelligence because they use common cognitive functions. One important difference is that creativity likely utilizes open-mindedness, while intelligence does not (Silvia et al., 2009). In the present study, we will further investigate how open-mindedness may mediate the relationship between creativity and intelligence by incorporating additional theoretically motivated measures of these variables. Understanding the nature of this relationship will aid in designing ways to enhance creativity.

◆ **Poster 110** ◆

Inscribing Identity: The Development of the Latin Script in Ancient Rome and Early Modern Vietnam

Presented By: Campbell Rosener; RICCI Scholars Program

Supported By: Dr. Laura Gawlinski, Classical Studies; Dr. Mine E. Cinar, Business; Dr. Anne Wingenter, History (John Felice Rome Center); Dr. Ngyuen Luu Bao Doan, Univeristy of Economics - Ho Chi Minh City

My case studies derive from two places of cultural contact—Rome and Vietnam—when writing practices interact with the identities of individual writers. Four case studies of inscribed objects

from 7th-4th centuries BCE (the Marsiliana tablet, a lenticular aryballos, a bucchero amphora, and the Lapis Niger cippus) trace the development of the Latin script in Italy, and two manuscripts from 17th century CE Vietnam (a meeting log, and a personal letter from a Vietnamese convert) show how chữ Quốc ngữ—the Latin script that Jesuit colonizers adapted for the Vietnamese language—was negotiated by foreign missionaries and Vietnamese converts. I consider identity a phenomenon which is personal, social, and cultural (Astoreca 2021b); I use a cultural approach to studying writing, where writing is defined as “an element of social practice within a given cultural environment” (Boyes et al. 2021). Writing, as a performative act (Ragazzoli et al. 2018), must be approached on its own terms. Across these wide-ranging texts, I identified three common strands: use of writing as a response to historical context, use of writing to evoke orality, and use of writing for commemoration. For example, both the letter and the amphora contain first-person signatures which would be read aloud, necessarily animating them. The poster illustrates these findings by centering pictures of the six objects, highlighting graphically the relevant details of writing relevant to the three strands. There is an introductory abstract, then an overview of the aforementioned cultural approach. Next are boxes discussing the strands, followed by concluding observations and further reading.

◆ **Poster 111** ◆

The Role of PhLP3 in Drosophila Spermiogenesis and its Cytoskeletal Implications

Presented By: Anthony Roukoz; Mulcahy Scholars Program

Supported By: Dr. Jennifer Mierisch, Biology

Phosducin-like protein 3 (PhLP3) may function as part of a co-chaperone in the folding of cytoskeletal proteins in the chaperone containing tailless (CTT) complex. Previous studies have demonstrated that DmPhLP3 plays a role in the process of spermiogenesis in drosophila. Additionally, mutant flies exhibited decreased levels of DmPhLP3 mRNA, a failure to elongate the nucleus during spermiogenesis, and infertility. Recently, we have shown that overexpression of PhLP3 in drosophila has no effect on male fertility. Via generation of CRISPR constructs, TEM imaging, and subsequent immunostaining— we seek to address the root mechanisms of PhLP3 in the process of drosophila spermiogenesis.

◆ **Poster 112** ◆

Investigating the Ethical Concerns of Brain-Machine Interface for Human Enhancement

Presented By: Priscilla Ruiz

Supported By: Dr. Jennifer Parks, Philosophy; Dr. Joe Vukov, Philosophy

Brain-machine interface (BMI) holds great promise for enhancing human capabilities, but raises important ethical considerations that need to be addressed. BMI is a neuroprosthetic used to augment the patient’s own nervous system. For example, BMI allows patients with movement disorders to train an intelligent controller like a robotic hand. This research investigates the ethical concerns surrounding the use of BMI for human enhancement. I intend to explore issues such as privacy and fairness in the implementation of BMI technology. Understanding and addressing the ethical concerns of BMI is crucial for ensuring that this technology is developed and used responsibly.

◆ **Poster 113** ◆

Blue water Portfolio Management

Presented By: Graham Ryer, Jack Gainer, Ryan Nematollahi

Supported By: Dr. Steven Todd, Business

The BlueWater mutual fund consists of: Portfolio Manager: Graham Ryer
Lead Strategist: Jack Gainer
Lead Analyst: Ryan Nematollahi
Head Trader: Zach Mulhearn

This fund began the semester mirroring the technology sector fund XLK as a benchmark. We have since researched related tech sector stocks and made strategic investments to diverge from the benchmark. Our goal as a fund is to outperform the XLK fund by following stock valuation techniques we learned in our portfolio management class. Our presentation will cover the methods we took to invest and the result of our investments.

◆ **Poster 114** ◆

Latinx Youth and Navigating Belonging In White Neighborhoods

Presented By: Jetzemany Sanchez

Supported By: Dr. Guadalupe Lopez Hernández, Psychology; Danieli Mercado Ramos, Psychology

The demographics of the white Midwest suburbs have shifted, with more Latinx families moving to the suburbs. This study used semi-structured interviews to explore how Latina youth (N=7) describe their experiences in these neighborhoods, as they are still the minority. Additionally, we explored their thoughts about living in these neighborhoods in the long term. Through thematic analysis, we found that participants highlighted positive attributes of their neighborhoods, even after reporting exclusive experiences and not feeling supported by other members of the community. Results will report their mixed responses and how they make sense of their belonging in suburban communities.

◆ **Poster 115** ◆

Using growth curves to estimate fitness of bacteria evolved under nutrient limitation in the presence of ampicillin.

Presented By: Alexa Schnell; Mulcahy Scholars Program

Supported By: Dr. Caroline Turner, Biology

As bacteria become increasingly resistant to antibiotics, the efficacy of established treatments suffers, posing a global health threat. We are interested in environmental effects on the evolution of resistance. We conducted a 16-day experiment which propagated E. coli populations in carbon- or nitrogen-limited media treated with ampicillin. The resulting evolved populations were so much more fit than their ancestors that traditional methods of evaluating fitness were incompatible. Thus, I analyzed growth curves of the ancestral and evolved populations to estimate fitness differences. As a result of my work, it is evident ampicillin resistance evolves differently in carbon- and nitrogen-limited media.

◆ **Poster 116** ◆

The Concentration of Heavy Metals Within Bird Feathers of Neotropical Migrants Found on Loyola's Lakeshore Campus

Presented By: Rowan Schul; School of Environmental Sustainability (SES) Undergraduate Research Fellowship

Supported By: Dr. Gordon Getzinger, School of Environmental Sustainability ; Rev. Stephen Mitten, S.J., School of Environmental Sustainability; Dr. Federico Sinche, School of Environmental Sustainability

Bioindicators are used to track the health of ecosystems. Biomonitoring is used to create baseline data and identify anomalies so solutions can be implemented in a timely manner. This research focuses on the use of migratory birds as bioindicators of ecosystem health and furthers our understanding of the bioaccumulation effects on birds exposed to pollutants. The project focuses on heavy metals as they are known to cause acute and chronic effects on wildlife. Statistical analysis of the heavy metal concentrations found in bird feathers was used to establish correlations between seasons, species, feeding guilds and pollutants.

◆ Poster 117 ◆

India and the United States: The Constitutional Protection of Religious Minorities

Presented By: Durshun Shah; RUDIS Fellowship Program

Supported By: Dr. Chris Hasselmann, Political Science

Following the partition of Colonial India in 1947, horrific religious violence accompanied mass migration into two new dominions, begging questions of protecting religious minorities and secular government in the drafting of India's Constitution. Similarly, questions of religious freedom in the United States created a precedent for its protection in the constitution. Both countries' status as the world's two largest democracies and emphasis on secularism warrant comparison and analysis, specifically the constitutional protection of religious minorities, historical and political precedents for their inclusion in both constitutions, their subsequent enforcement, and progress in securing these rights for religious minorities in both countries.

◆ Poster 118 ◆

Tissue Specific Reporter Lines Demonstrate the Dependence of Peripheral Circadian Clock Function on an Intact Central Brain Clock

Presented By: Natalie Shamon; Provost Fellowship; Other

Supported By: Dr. Daniel Cavanaugh, Biology

Circadian rhythms are roughly 24-hr cycles that provide advantages for organisms to adapt behavior to environmental changes. Since fruit flies (*Drosophila*) share many functional aspects of circadian regulation with humans, they are an important model organism for circadian research. Our lab developed two luciferase reporter lines for *Drosophila*, enabling real-time monitoring of circadian gene expression by emitting light in response to clock gene activity in the fly fat body. We used these lines to eliminate central clock function, and observed the impact on the peripheral clock, allowing insight into the relationship between circadian clocks in different regions of the body.

◆ Poster 119 ◆

Multi-Omics Investigation of Anxiety Phenotypes in Diverse Ancestral Populations

Presented By: Maya Sharma; Mulcahy Scholars Program

Supported By: Dr. Heather Wheeler, Biology

The first GWAS were performed using individuals of mostly European ancestry, and researchers have found that the findings from these studies do not replicate well in diverse populations. The Pan-UK Biobank (Pan-UKB) and the All of Us (AoU) database are actively working towards correcting this issue by collecting data from individuals of diverse ancestries. By analyzing phenotypic and genotypic data in the Pan-UKB and AoU databases, this project seeks to identify potentially causal genetic variants that lead to anxiety in individuals of European, Central and South Asian, and African ancestries.

◆ Poster 120 ◆

Deciphering Parallel Evolution: The Impact of Sequencing Methods on Evolutionary Insights

Presented By: Umar Siddiqui

Supported By: Dr. Caroline Turner, Biology

Understanding parallel evolution is pivotal in evolutionary biology, offering insights into how similar traits evolve across different species. This study examines two genetic research methodologies, individual clone analysis and mixed sequencing, to determine their impact on the

detection and analysis of parallel evolution. By contrasting these approaches through the lens of the Long-Term Evolution Experiment and additional case studies, we aim to highlight how methodological choices influence our perception and understanding of parallel evolutionary processes. Our findings seek to contribute to the broader understanding of evolutionary dynamics, emphasizing the significance of selecting appropriate sequencing methods for studying parallel evolution.

◆ **Poster 121** ◆

Truth in the modern world, What is real?

Presented By: Emmanuel Sisay

Supported By: Dr. Hans Svebakken, Theology

The idea of finding the truth or even just that one statement that seems to be the most accurate is very satisfactory. The truth is said to refer to the accuracy of a statement and the authenticity of a statement or topic. The truth in many recent years has come in many different forms as some include the influence of confirmation bias and fake news. Forms like these are shaping new relationships between the individuals and what they believe. Many seek the truth in their own understandings or what they may think is right, which sometimes results in approaching misinformation. The search for the Truth is becoming increasingly harder in the newer day, which some question what is right? With the use of finding real evidence, critical thinking and logical reasoning, we're able find the correct information and be able to distinguish different truths and how facts and biased opinion play roles in forming truth.

◆ **Poster 122** ◆

Analyzing The Flood And Stormwater Management Of Rome And Ho Chi Minh City And The Potential For Green Infrastructure

Presented By: Megan Smith

Supported By: Dr. Mine E. Cinar, Business; Dr. Anne Wingenter, History (John Felice Rome Center); Dr. Ngyuen Luu Bao Doan, University of Economics - Ho Chi Minh City

This presentation will compare the flood and stormwater management of Rome, Italy, and Ho Chi Minh City, Vietnam, and will analyze their potential for green infrastructure. During the 2022 - 2023 academic year, I studied abroad in Rome and traveled to Ho Chi Minh City to gain a deeper understanding of the infrastructure of the John Felice Rome Center and the University of Economics- Nguyen Van Linh campus. Coupled with an extensive literary analysis, for each campus I identified areas of potential concern for both current and future climactic conditions and provided green infrastructure suggestions. Through this experience, I was able to better understand the rising concerns of flood and stormwater management and connect two case studies through cross-cultural comparison.

◆ **Poster 123** ◆

Infusion Pump Mobile Application Engineering Capstone Design Project

Presented By: Leah Smith, Dhruv Patel, Esther Wayntraub, Lauren David, Zhiyin Wu

Supported By: Dr. Gail Baura, Engineering; Dr. Thomas Johnson, Engineering; Matthew Bivans, Baxter Healthcare

This project, sponsored by Baxter, focused on developing a user-friendly mobile application for the management of infusion pumps. Aimed at improving patient safety, minimizing manual data entry, and enhancing the overall convenience for healthcare providers, the application features key functionalities such as patient verification, barcode integration, and delivery confirmation. The system facilitates remote monitoring and management of infusion pumps, offering a seamless integration with existing healthcare protocols and systems, thereby improving the efficacy and safety of medication delivery in clinical settings.

◆ Poster 124 ◆

Analyzing Population Genetics Between Astragalus lentiginosus and Its Fungal Endophyte

Presented By: Zoe Smutko

Supported By: Dr. Michael Grillo, Biology

Astragalus lentiginosus is the most species-rich genus in the world with over 3,000 varieties. Swainsonine, an alkaloid toxin, is produced as a secondary metabolite synthesized by *Astragalus*'s mutualistic fungal endophytes. Natural swainsonine levels are variable both across and within *Astragalus* species, which raises questions regarding why only some varieties exhibit this fungal-plant mutualism. Through a variety of sequencing methods, the genetic sequence of the fungal endophyte will be collected and compared to the previously constructed *Astragalus* sequence. This information will provide valuable insight into the coevolutionary dynamics in this mutualism and what causes the natural variation in swainsonine levels.

◆ Poster 125 ◆

Regulation of PSD-95 Ubiquitination by Pin1 and GSK3beta

Presented By: Hannah Srinivasan, Hannah Srinivasan, Abby Thielbar, Sai Kanuru, Adalia von Rommel, Het Gor, Bri Galvin, Taran Singh

Supported By: Dr. Jary Delgado, Biology; Meera Patel, Biology

Dysregulated synaptic plasticity is a hallmark of neurological and psychiatric disorders. Often, this leads to the excessive loss of excitatory synapses and associated behavioral impairments. PSD-95 is a pivotal postsynaptic scaffolding protein that regulates synaptic maturation, receptor localization, and signaling proteins, including mediating NMDA receptor clustering and function in synaptic plasticity¹. NMDA Receptor-dependent long-term depression (NMDAR-LTD), a key contributor to excitatory synapse depletion, is regulated by the phosphorylation of threonine-19 (T19) on the synaptic scaffold protein PSD-95. NMDAR-LTD is dependent on multiple post-translational modifications. One of these modifications, the phosphorylation of PSD-95, destabilizes the protein which prompting the exit of associated AMPARs from postsynaptic spines². Our investigations highlight a potential factor in PSD-95 destabilization during NMDAR-LTD – the isomerization of phospho-T19 by Pin1. This isomerization, influencing the interaction between Pin1 and phosphorylated T19, may facilitate additional posttranslational modifications crucial for AMPAR endocytosis, namely ubiquitination. We hypothesize that the Pin1 mediated phosphorylation state of PSD-95 may either protect or target PSD-95 for ubiquitination, playing a critical role in NMDAR-LTD.³ Simultaneously, our research explores the impact of GSK3 β , an enzyme implicated in PSD-95 phosphorylation at T19 which may play a complimentary role to Pin1. This phosphorylation may play a role in the modified levels of PSD-95 ubiquitination. We set out to better understand this process through examining the relative levels of ubiquitinated PSD-95 in the process of Pin1 or GSK3 β . Our findings suggest a strong correlation between elevated levels of GSK3 β , or Pin1, and decreased levels of ubiquitinated PSD-95.⁴

◆ Poster 126 ◆

Exploring the Relationship Between Microplastics and Neurotoxicity

Presented By: John Stathopoulos

Supported By: Dr. Justin Harbison, Health Sciences and Public Health; Dr. Jennifer Parks, Philosophy

This presentation will look at the relationship between microplastics and neurotoxicity, focusing on the limits of our current knowledge. Despite being an especially relevant topic of conversation in the realms of environmental and public health, little is known about the effects that microplastics have on the brain. As a neuroscience student with interests in medicine, neurodegeneration, and public health, I found the lack of research shocking. Throughout this semester, I looked at primary research and news articles to explore the extent of our knowledge and limits of current microplastic research, as well as their potential neurotoxic effects and future steps.

◆ Poster 127 ◆

Investigating the Interactions Between Two Microtubule Associated Proteins of the Malaria Parasite Plasmodium

Presented By: Tanya Stoeva; Mulcahy Scholars Program

Supported By: Dr. Stefan Kanzok, Biology

The protozoan malaria parasite Plasmodium maintains its cellular shape with a network of cytoskeletal structures under its plasma membrane known as the subpellicular complex. Microtubules play a key part in this stabilizing complex. The novel microtubule associated proteins SAXO and TrxL-1 are hypothesized to form stabilization complexes inside the microtubules for regulation and structural reinforcement. My project investigates the relationship between SAXO, TrxL-1 and microtubules by utilizing a human cell line as a model system. The results of my research will give us new insights into the adaptive mechanisms of the malaria parasite.

◆ Poster 128 ◆

Emotion's Effect on Perceived Cultural Distance as a Moderator of Human Rights Engagement

Presented By: Elizabeth Stotz

Supported By: Dr. Dinko Bačić, Business

This research study investigates the potential effects of emotional video campaigns on human rights engagement with perceived cultural distance as a moderator. Emotional valence and intensity's roles in encouraging engagement are also explored. During the 2024 Spring semester, I designed and conducted the experiment, analyzed results, and formally wrote up the study as a part of BHNR343 under Dr. Bačić's supervision. The study is aimed at helping human rights organizations implement more effective campaigns. Through this experience, I was able to fully understand the robust process of academic research and further educate myself and others on barriers to prosocial action.

◆ Poster 129 ◆

The Prevalence of Child Play Near Natural Waterways and How it Relates to Health

Presented By: Sylvia Stypinski

Supported By: Dr. Colleen Kordish, Nursing; Dr. Barbara Velsor-Friedrich, Nursing

Significance: One area of environmental concern is contamination in natural waterways. Contamination can be related to toxins such heavy metals, pesticides, man-made organic chemicals, or bacteria. Such contaminants are known to have lasting effects on human health. Children are at elevated risk for exposure to environmental contaminants due to their smaller body habitus, developmental stage, requisite for active play, social environment, and eating habits. Nursing actions can address health concerns for families whose children play in these environments as their children have limited self-care capabilities. The prevalence of children playing around natural waterways is unexplored in the literature. The purpose of this study is to determine the prevalence of children playing near natural waterways and the contaminants they may be exposed to by their requisite need for play.

Theoretical framework: This study is guided by Orem's self-care deficit theory.

Methods: This study will use a cross-sectional descriptive survey design. A retrospective convenience sample of 150 young adults between the ages of 18 to 30 years will be anonymously surveyed via social media regarding their childhood memories of playing around natural waterways alone and with others. Demographics will be queried. SPSS data analysis will consist of correlational and regression analysis.

Conclusion: Assessing outdoor water play as an environmental concern is not part of pediatric nursing guidelines. With known situations of environmental contaminants, and their effect on children, establishing the prevalence of children playing near natural waterways could lead to the addition of environmental assessment questions for pediatric nursing.

◆ Poster 130 ◆

Evolution of Dental Complexity in Mammals

Presented By: Pranati Sukh

Supported By: Dr. Megan Whitney, Biology

The evolutionary transition from reptiles to mammals has been an area of interest due to the rich fossil record present. Characterized by transitional morphology, non-mammalian synapsids offer a connection in understanding the origins of different mammalian traits. Variations in dental characteristics and analyzing the rate and mode of evolution associated with dentition will offer insights into the pattern of dental trait evolution across synapsid history. This project aims to investigate the evolutionary history of mammalian dentition by examining dental traits exclusive to mammals and is significant because it will allow the comprehension of mammalian evolutionary adaptations.

◆ Poster 31 ◆

Gene annotation of Pi3K92E in Drosophila rhopaloa and Drosophila obscura

Presented By: Caroline Suscha

Supported By: Dr. Jennifer Mierisch, Biology

My annotation project goal was to analyze how genes in the insulin pathway have diverged across species, using *D. melanogaster* as a reference species. I annotated the Pi3K92E gene, which functions relatively early in the insulin signaling pathway. While generally, genes and their neighborhoods become more dissimilar as species become more diverged, my findings suggested the opposite. I found the *D. rhopaloa* gene for Pi3K92E was more dissimilar from the *D. melanogaster* Pi3K92E than the more diverged *D. obscura*. It is important to compare these genes across species to better understand how the insulin pathway can change over time.

◆ Poster 132 ◆

Characterizing the Enzymatic Efficiency and Thermal Stability of Beta-Glucosidase B (BglB) Mutant N404M

Presented By: Amanda Swedrowski, Lucia Burciaga

Supported By: Dr. Emma Feeney, Biology; Ashley Vater, National Science Foundation, Justin Siegal Lab at UC-Davis

We hypothesize that the Beta-glucosidase (BglB) mutant N404M will demonstrate an increase in catalytic efficiency and thermal stability in comparison to the wild type because the mutant's overall Foldit score difference of ~3 suggests an increase in the enzyme's overall stability. Intermolecular modeling analysis points to decreased local hydrogen bonding but an overall increase for transient protein-protein interactions with methionine since methionine can form additional bonds with neighboring aromatic amino acids which can increase stability. Furthermore, previously published data on similar mutations, N404A and N404C, support this hypothesis since both mutations display expression, increased thermal stability, and increased catalytic efficiency.

◆ Poster 133 ◆

Does Personality Affect Password Strength?

Presented By: Arrianna Szymczak; Provost Fellowship

Supported By: Dr. Eric Chan-Tin, Computer Science; Dr. Sheila Kennison, Oklahoma State University

Everyone has important data stored online in 2024. Hacking is one of the greatest threats to your data. It is a constant battle to teach proper cyber security habits to keep up with the growing threat of having data stolen by hackers. What if there was a way to tailor training to better fit you and your personality? This study determines if password strength can be affected by tailored training.

◆ **Poster 134** ◆

Molecular Dynamics Simulations of the Dissolution of Acetaminophen Co-Crystals

Presented By: Lauren Thompson; Provost Fellowship

Supported By: Dr. Ken Olsen, 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 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 a crystal in water, as well as how they dissolve when placed in a simulated water box. We will use this data to predict the interactions and relative dissolution rates of these molecules.

◆ **Poster 135** ◆

The Industrial Revolution of ARTs: The current applications and ethics of the Assisted Reproductive Technology Industry

Presented By: Joseph Tocco, Tera Joseph, Michael Quiroz, Arely Tellez

Supported By: Dr. Dawn Franks, Biology; Dr. Jennifer Parks, Philosophy

Assisted Reproductive Technologies (ARTs) are technologies and procedures such as IVF and Embryo Vitrification. In the past, ARTs were used out of necessity by couples experiencing infertility, however modern applications have inspired a growing population to utilize these emerging technologies. Currently a multi-billion dollar industry, several ethical concerns have arisen from a profit driven clinic model such as the prioritization of profits over results and the increased physical and psychological toll on ART patients. Through this project, our group will review the current and future technology of ARTs and analyze the ethical concerns of an industrialized ART market.

◆ **Poster 136** ◆

Freeze-in and Freeze-out of Dark Matter from the Boltzmann Equation

Presented By: Themistoklis Tzellos; Mulcahy Scholars Program

Supported By: Dr. Walter Tangarife, Physics

Dark matter, its origins and how its density has evolved during the universe's expansion is one of the most pressing questions in physics. It seems to account for about 27 percent of the universe, and yet we don't yet know either what it is made of or how it interacts with the matter we know. This project studies the mechanisms that Dark Matter gets produced in. Specifically, I examined the FIMP paradigm, a model of dark matter that interacts feebly with ordinary matter.

◆ **Poster 137** ◆

Evaluating Soil Quality and Biodiversity at Columbus Park to Inform the Design and Planning of Community Stewardship Workdays

Presented By: Marinda Vacanti; School of Environmental Sustainability (SES) Undergraduate Research Fellowship

Supported By: Dr. Laura Brentner, School of Environmental Sustainability

This project evaluates how soil quality and biodiversity vary through Columbus Park in the southwest neighborhood of Austin. Since 2012, restoration work has been taking place through the Chicago Park District's Community Stewardship Program. The goal of this project was to examine the success of previous restoration work. Fieldwork was conducted at three types of sites: historically restored, newly restored, and unmanaged but protected. Soil quality was determined by testing macronutrient and heavy metal levels. Plant biodiversity surveying helped determine species richness and abundance. The results will help advise planning of community restoration workdays to target areas of most concern.

◆ **Poster 138** ◆

Using Molecular Dynamics Simulations to Study the Effect of Convergent Somatic Hypermutations on Antibody Structure and Dynamics

Presented By: Isabella Vari; Provost Fellowship

Supported By: Dr. Joerg Zimmermann, Chemistry and Biochemistry

Understanding the selection pressures and underlying mechanisms during an adaptive immune response has been a longstanding goal of immunological research, since it determines antibody functionality. I want to use Molecular Dynamics (MD) simulations to better understand the functional consequences of convergent somatic hypermutations (SHMs), which are mutations that occur in antibody genes during the adaptive immune response and have been observed in more than one antibody and therefore may be mutations that act in an antigen-independent manner. The goal of the work is to identify convergent SHMs for which changes in the average structure or the dynamics of the antibody binding site upon introduction of the convergent SHMs, are observed. For such convergent SHMs, I will then use MD simulations to identify the molecular mechanisms that cause the observed changes. This work will also identify candidates for experimental characterization. The proposed work may add a new and important facet to the many mechanisms at play in the immune system. Identification of antigen-independent SHMs may also have implications for the development of vaccines and antibody-based therapeutics. For vaccines, identifying immunogens that preferentially trigger such SHMs with known effects on the outcome of the immune response may help improve vaccine efficacy. For antibody-based therapeutics, introducing (or reversing) such SHMs may help improve or broaden the therapeutic effect of the drug.

◆ **Poster 139** ◆

How symptoms of ADHD and CDS in Black and/or Latiné youth affect Anxiety and Depression symptoms

Presented By: Madeline Warrick

Supported By: Dr. Zoe Smith, Psychology

This study will describe the effects of ADHD and cognitive disengagement syndrome (CDS) symptoms on anxiety and depression symptoms in Black and/or Latiné youth. In previous research, the comorbidity between ADHD and anxiety and depression has been studied. However, there is little research on CDS and its effects on anxiety and depression symptoms. We expect to find that higher levels of CDS and ADHD symptoms lead to a greater number of both anxiety and depression symptoms.

◆ **Poster 140** ◆

Understanding Mesoamerican Life Cycles and Rituals Through Figurines

Presented By: Laney Waters

Supported By: Dr. Christopher Hernandez, Anthropology

Children of ancient times are frequently overlooked within the archaeological record. For this presentation, I examined different aspects of Mesoamerican culture in order to identify two figurines discovered at the Postclassic site of Tzunun, Mexico. One, a ritualistic rattle, was likely used in birthing ceremonies. The other, a miniature, is likely some form of children's toy. These figurines shine light onto ritualistic objects and ceremonies regarding childbirth as well as aiding to clarify the roles and expectations of Mesoamerican children. They allow us to look into the past to reconstruct Maya life cycles and how children progressed in Maya society.

◆ **Poster 141** ◆

Investigating the Impact of XPB1S Transgenic Activation in Oligodendrocytes on Multiple Sclerosis Mouse Model

Presented By: Samantha Wills, Ian Steckler

Supported By: Dr. Yanan Chen, Biology

Inflammation-triggered stress initiates the unfolded protein response (UPR) in both Multiple Sclerosis (MS), an autoimmune demyelinating disease, and its mouse model, experimental autoimmune encephalitis (EAE). We hypothesized that forcefully inducing the IRE1 UPR pathway through XBP1s activation could protect oligodendrocytes, offering therapeutic promise for MS. Using EAE in oligodendrocyte-specific knock-in Xbp1s mice, we observed reduced disease progression. EM analysis showed increased myelinated axons and histology analysis showed fewer CD3+ T cells and increased TPPP+ oligodendrocytes for end of disease spinal cords in Cre+ compared to Cre- mice, demonstrating protection to EAE mice through safeguarding oligodendrocytes, preserving myelin, and mitigating inflammation.

◆ **Poster 142** ◆

ML-Based Models for Predicting Unregulated Disinfectant Byproducts

Presented By: Katrina Ziemniak

Supported By: Dr. Maryam Amouamouha, Engineering

Machine learning (ML) techniques can make the monitoring of unregulated disinfectant byproducts (UR-DBPs) more feasible to small water distribution networks (SWDNs) that are limited by the cost and staff for regular sampling. Methods and results for using ML-based models to predict UR-DBP concentrations were compared across three different papers using coefficient of determination values. The best performing models included GRNN, RF, SVR, and GPR for predicting either DCAN, TCP, or CPK concentrations. Comparing prediction accuracy for the same model types built on different datasets will help SWDNs best choose which models to focus their energy on developing.

◆ **Poster 143** ◆

Financial Issues Surrounding Assisted Reproductive Technology (ART)

Presented By: Molly Zink, Elle Laurencelle, Grace Shallal, Solea Smith

Supported By: Dr. Dawn Franks, Biology; Dr. Jennifer Parks, Philosophy

This presentation will describe the impacts of socioeconomic status on the utilization and outcomes of assisted reproductive technology (ART). ART involves treatments that handle embryos and oocytes, excluding sperm-only procedures. We examine how having access to ART procedures impacts different socioeconomic groups, thus creating various disparities in reproductive opportunities. These financial barriers may inadvertently perpetuate a form of modern eugenics, where only certain groups can afford to reproduce, leading to a homogenization of genetic diversity. We demonstrate how the current ART landscape creates inaccessible fertility solutions for women of color, leads to poorer outcomes for minority women, and thus drives the reproductive disparities we see currently.

◆ Poster 144 ◆

Loyola's Urban Agriculture Program and Herbicide Pollution Research

Presented By: Connor Olds; Baum Graduate Research Fund

Supported By: Kevin Erickson, Urban Agriculture; Dr. Gregory Palmer, School of Environmental Sustainability

Since its introduction in 1958, atrazine has become one of the most widely used herbicides in the U.S. However, Atrazine threatens ecosystem health when it infiltrates soil and water systems. Recently, microbial bioremediation has become an effective method of combating herbicide pollution. To build a solid foundation of agricultural knowledge before conducting research within the field, I interned for Loyola's Urban Agriculture Program. This included working in multiple departments, giving me a variety of perspectives on the industry. After building this base, I began working on a research project aimed at cultivating and identifying microorganisms capable of degrading atrazine.

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.

FACULTY CERTIFICATE IN EXPERIENTIAL LEARNING

The Center for Engaged Teaching, Learning, and Scholarship offers a faculty certificate program for Loyola's faculty to build strategies in teaching experiential learning courses. Faculty are

encouraged to engage in five workshops and as a culminating project, faculty then share a course syllabus including the experiential learning course elements. Upon completion of the series, faculty participants earn a faculty development certificate in experiential learning, are named a Community-Engaged Experiential Learning Scholar, and have priority access to Engaged Teaching and Learning Faculty Funding.

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.

LEARNING PORTFOLIO 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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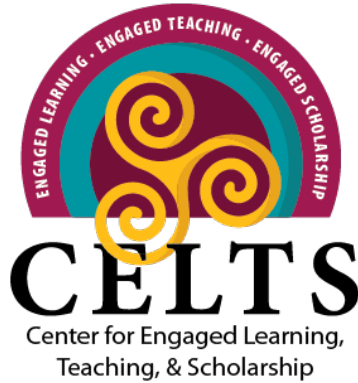
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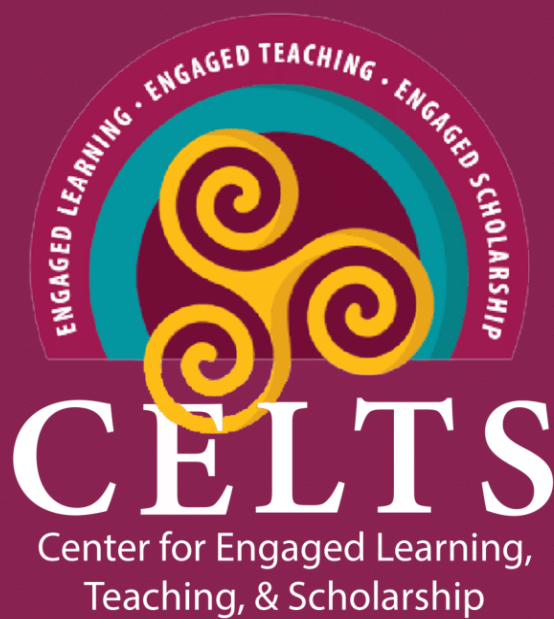
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