



**FAU**  

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**UNDERGRADUATE  
RESEARCH AND INQUIRY**  
Florida Atlantic University

13TH ANNUAL  
UNDERGRADUATE  
RESEARCH SYMPOSIUM  
April 7, 2023

# Welcome

*Welcome to the 13th Annual Undergraduate Research Symposium*, which showcases undergraduate students at FAU who are engaged in research, scholarship, and creative activities. Students present their findings through poster or visual and oral or performing arts presentations, and represent all disciplines, all colleges, and all campuses of FAU.

Few activities are as rewarding intellectually as research and inquiry. In addition to the acquisition of invaluable research skills, students learn how knowledge is created and how that knowledge can be overturned with new evidence or new perspectives. Such scholarly activities engage students in working independently, overcoming obstacles, and learning the importance of ethics and personal conduct in the research process.

Again this year, we are pleased to offer cash awards for first-place oral winners in all categories, thanks to the generous donation of Dr. Eric H. Shaw, Emeritus Professor, College of Business. We are grateful to Dr. Shaw's support of the Undergraduate research initiative and our student scholars.

The Office of Undergraduate Research and Inquiry (OURI) serves as a centralized support office of faculty and students who are engaged in undergraduate research and inquiry across all colleges and campuses. We offer and support university-wide programs such as undergraduate research grants, annual undergraduate research symposia, undergraduate research journals, LEARN, prestigious fellowships and scholarships, and the undergraduate research certificate, to name a few.

For more information on how OURI can help you, please visit our website at [www.fau.edu/our](http://www.fau.edu/our)

## **Special Thanks To:**

Dr. Eric H. Shaw

College of Business

Council for Scholarship and Inquiry (CSI)

Division of Research

Faculty Judges

Faculty Mentors/Advisors

Graduate College

OURI Faculty Liaisons & Peer Mentors

Staff and Student Volunteers

Undergraduate Studies

University Libraries

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# Agenda

## 13<sup>th</sup> Annual Undergraduate Research Symposium

Friday April 7<sup>th</sup>, 2023

**#FAUOURILucky13**

Time	Event	Location
8:00 a.m. – 2:00 p.m.	On-Going Registration	Schmidt Family Complex Lobby
8:00 a.m. – 10:00 a.m.	Refreshments available (coffee)	Schmidt Family Complex Lobby
8:30 a.m. – 8:45 a.m.	Welcome Message: Interim President Volnick	SFC 107
8:45 a.m. – 10:00 a.m.	Poster Session I (morning)	Schmidt Family Complex Lobby/Hallway
10:15 a.m. – 11:30 a.m.	Oral Sessions	SFC 112, 114, 116, 118, 122
11:45 a.m. – 1:00 p.m.	Lunch and Panel Session: <i>Harnessing the power of ChatGPT ethically</i>	Owls Nest/Perch
1:00 p.m. – 1:30 p.m.	<i>Oral Presentation Winners announced:</i> Dr. Eric H. Shaw	Owls Nest/Perch
1:45 p.m. – 3:00 p.m.	Poster Session II (afternoon)	Schmidt Family Complex Lobby/Hallway

# Lunch Panel Session

## Harnessing the Power of ChatGPT

This panel discussion will focus on the ethical use of ChatGPT, a large language model trained by OpenAI, and its implications for undergraduate students. The panelists will explore the potential benefits of ChatGPT, but also raise concerns about the ethical challenges it poses. Undergraduate students may use ChatGPT for various purposes, such as improving their writing skills, generating ideas for research projects, or seeking answers to academic questions. However, the ethical use of ChatGPT is crucial in this context, as students need to ensure that the content generated by the model is original and does not violate academic integrity guidelines. The panelists will also discuss the limitations of the technology and the potential biases that may be present in the training data. This discussion will help undergraduate students approach the use of ChatGPT critically and with a sense of responsibility, while also recognizing its potential as a valuable tool for academic and professional development.

### Panel Moderator:

Carol Bishop Mills, Ph.D., Director, School of Communication and Multimedia Studies  
Dorothy F. Schmidt College of Arts and Letters, Florida Atlantic University

### Panelists:

- Jeffrey R. Galin, Ph.D., Professor, Department of English, Dorothy F. Schmidt College of Arts and Letters
- Xingquan Zhu, Ph.D., Professor, Electrical Engineering and Computer Science, College of Engineering and Computer Science
- Ella Bethke, Undergraduate Student/Researcher, College of Engineering and Computer Science/FAUHS
- Gina Ciprano, Graduate Student/Researcher, College of Education
- Katie Poquette, Undergraduate Student/Researcher, Harriet L. Wilkes Honors College/FAUHS
- Briana Thomas, Undergraduate Student/Researcher, College of Social Work and Criminal Justice

# Awardees

## 2022-23 Undergraduate Researchers of the Year

Each year the Office of Undergraduate Research and Inquiry (OURI) invites nominations for the Annual *Undergraduate Researcher of the Year* awards. One student from every college is selected for this award and is recognized at the annual Honors Convocation with "Undergraduate Research Scholar" stole to wear during their graduation ceremony. These selected students are in good academic standing, have participated in at least two semesters of documented faculty-mentored undergraduate research and inquiry at FAU, and often have presented at multiple conferences and symposia, engaged in additional research activities, and even published their research as an undergraduate!

### 2022-23 Awardees:

<b>Undergraduate Researcher of the Year</b>	<b>College</b>	<b>Faculty Mentor</b>
Ciara O'Neill	Dorothy F. Schmidt College of Arts & Letters	Justin White
Mya Barsoum	College of Business <i>Allen E. Smith Awardee</i>	Eric Levy
Daylenis Mendez	College of Education	Sharon Darling
Lusnel Ferdinand	College of Engineering & Computer Science	Daniel Meeroff
Esther Peramune	Harriet L. Wilkes Honors College	Jacqueline Fewkes
Steven Shatkhin	Charles E. Schmidt College of Medicine	Randy Blakely and Adele Stewart
Cecilia Malafia	Christine E. Lynn College of Nursing	Candy Wilson
Carolina Hernandez Burgos	Charles E. Schmidt College of Science	Xavier Comas
Briana Thomas	College of Social Work and Criminal Justice	Lincoln Sloas

## **2022-23 Distinguished Mentor of the Year (DMOY)**

Faculty who serve as model mentors to their undergraduate research students are eligible to receive the Distinguished Mentor of the Year: Excellence in Undergraduate Research and Inquiry award. Each year, one university-wide award will be given based on the undergraduate research engagement in the previous year. The Distinguished Mentor of the Year will be recognized with a \$2,500 award at the annual Honors Convocation.

### **2022-23 DMOY Awardee**

#### **Dr. Maré Cudic**

Associate Professor of Chemistry and Biochemistry  
Charles E. Schmidt College of Science

Dr. Cudic's research interests are in the area of glycosciences. She feels fortunate to share her passion and knowledge of this field with FAU's students through her teaching and research activities. Since joining FAU in 2014, Dr. Cudic mentored and trained thirty-three undergraduate students majoring in chemistry, biology, neuroscience, and exercise science through the Direct Independent Study/Research (DIS/DIR) program in Chemistry. She also mentored six undergraduate students enrolled in the Honors in Chemistry program. Her students present their research results at the local, regional, national, and international conferences and have received numerous awards and recognitions from the scientific community. Under her guidance, thirteen undergraduate students (some have been awarded more than once) received the Undergraduate Research Grant, and four undergraduates were awarded a Summer Undergraduate Research Fellowship (SURF). Most impressively, ten undergraduate students are first author or co-authors, and some of them on more than one paper, in high impact journals such as the *Proceeding of the National Academy of Sciences of the United States of America* (PNAS), *Biochemistry*, *ACS Chemical Neuroscience* (ACS Chem. Neurosci.), and *Journal of Organic Chemistry* (JOC). The advanced and well-designed training in her lab at the interface of chemistry and biology and co-authorship on publications resulted in prestigious internships (e.g., Scripps FL), graduate school admissions (e.g., MIT, University of Houston), medical (Rowan University School of Osteopathic Medicine) and nursing schools (Kaiser University, School of Nursing), jobs in government office (e.g., Palm Beach County - Office of Public Health Preparedness), and industry (GENEWIZ, A Brooks Life Sciences Company).

Dr. Cudic is very proud of all her students and their achievements, and she considers their success as one of her greatest accomplishments as a FAU professor.



## 2022-23 Prestigious Fellowship Awardees (Research)

<b>Goldwater Scholarship</b>		
Awardee	College	Research Mentor(s)
David Baldwin	Wilkes Honors College	Chris Moore, Iris Segura-Garcia
Michael Green	Science/FAUHS	Tricia Meredith

<b>NSF Graduate Research Fellowship</b>		
Awardee	College	Research Mentor
Casey Hudspeth	Science	Kate Detwiler
Kate Maier	Wilkes Honors College	Salil S. Bidaye
Ivan Riveros	Science	Ilyas Yildirim

We are proud to announce FAU's nationally competitive *research* awardees for this year. The **Barry Goldwater Scholarship** is the most prestigious research award for undergraduates. For the second year in a row, FAU has two undergraduate students who were selected as Goldwater Scholars from a pool of 1,267 students from 483 institutions nationwide. They join a network of over 10,000 awardees, many of whom have gone on to win other prestigious graduate awards like the National Science Foundation's Graduate Research Fellowship, Rhodes Scholarship, Churchill Scholarship, and the National Defense Science and Engineering Graduate Fellowship. FAU has three students who were selected for the **National Science Foundation's Graduate Research Fellowship (NSF GRFP)**, which is the oldest research fellowship for graduate study in STEM. Recipients of both awards can be found conducting research to help defend the nation, finding cures for catastrophic diseases, and teaching future generations of scientists, mathematicians, and engineers. If you are interested in applying for these or other prestigious fellowships, please visit our website at <https://www.fau.edu/fellowships/>.

## Cover Artist Statement

### *Watching the Sunset Together*

This photo was a perfect example of the stars aligning. I was working nights on campus, and I happened to drive by these owls that were outside of the preserve. By pure chance I had brought my camera and a 300mm lens with me to work to show my coworker. I returned to the office, grabbed the camera and as I returned the golden light of sunset hit just as both the owls came out of their burrow. I kept my distance then reported their location so they could be relocated to the correct preserve. This photo perfectly shows how blessed FAU is to have a mascot that we can observe in our local environment. Go Owls!

Jonathan Soberon, BBA in Business Management/Entrepreneurship  
College of Business

# Attention Students!

**Have you been involved in research or scholarly activities? Share your experience!**

## Submit your work to the **Undergraduate Research Journal!**

The Florida Atlantic Undergraduate Research Journal (**FAURJ**) is a peer-reviewed journal published online annually to:

- **Showcase** high quality undergraduate research
- **Teach** younger students of the standard of research
- **Promote** inquiry-based activities at FAU

Eligibility:

- research conducted by an undergraduate
- research mentored by FAU faculty member
- research compliant, if necessary

For complete information please visit the website:



**Application Deadline: May 26<sup>th</sup>**

Questions? Email: [ouri@fau.edu](mailto:ouri@fau.edu)

## **Become a Peer Mentor!**

### Applicant Eligibility

- Good Academic Standing at FAU
- at least one semester of documented research or scholarly experience

### What's in it for you? You will:

- earn funding to support your scholarly activity
- gain experience in leadership and teamwork
- guide, mentor, and inspire your peers
- expand awareness of undergraduate research at FAU
- plan and host workshops to expand the research culture
- have tons of fun!

For complete information and application process visit:



**Application Deadline: May 26<sup>th</sup>**

Questions? Email: [ouri@fau.edu](mailto:ouri@fau.edu)

# Oral Presentations

## Oral Session, 10:15 - 11:30am

Behavioral, Educational & Social Sciences

### **Should Drugs Be Legal?**

By: Kerri Cohn

Faculty Mentor(s): Monica Escaleras

Presenter(s): **Kerri Cohn**

According to the National Center of Drug Abuse Statistics, 22% of men and 17% of women have used illegal drugs within the past year. Illegal drugs are being used at a higher rate than they ever have before while simultaneously marijuana is being legalized. What do Americans really think about the legalization of marijuana? I hypothesized that party affiliation would influence opinions and there would be differences in the opinions between different political parties. To test my hypothesis, I conducted a 12-question survey in Survey Monkey and collected data using Amazon M-turk. I gathered data from 186 Americans aged 18+ with varying ages, gender, political affiliation, and education levels. The results show many Americans in opposition of the legalization of marijuana. I found a statistically significant difference between political parties and government rights. Legislators can use the results of this survey to understand who supports drug legalization and respond accordingly.

Behavioral, Educational & Social Sciences

### **Don't Say Gay? Public Opinion on Florida's Parental Rights in Education Bill**

By: Valerie Ong-Tua

Faculty Mentor(s): Monica Escaleras and Eric Levy

Presenter(s): **Valerie Ong-Tua**

Florida's Parental Rights in Education bill prohibits public school teachers from instructing students in grades K-3 about sexual orientation and gender identity. This bill has faced criticism from its opponents, who call it the "Don't Say Gay" bill. I hypothesized that there would be a difference in support of the bill among individuals with and without K-3 children. To test this hypothesis, I wrote a 14-question online survey using Survey Monkey and collected data from 196 American adults using Amazon MTurk. The results show a statistically significant difference in opinion about the bill among respondents with and without K-3 children. In addition, a statistically significant difference between individuals who believe the bill is beneficial and could also increase LGBTQ+ youth suicide rates was found. My results provide insight into the controversy of Florida's Parental Rights in Education bill and show that there may be widespread prejudice against LGBTQ+ individuals.

Behavioral, Educational & Social Sciences

**\$9.99 a Month - The Rise of Subscription Services**

By: Dylan Lewis

Faculty Mentor(s): Monica Escaleras and Eric Levy

Presenter(s): **Dylan Lewis**

In March 2020 the world changed forever. For the first time in many people lives the world seemed to have stopped. No one was going anywhere or doing anything. This in part pushed much of the world as we knew it online from work to school. This led to a drastic rise in internet usage overall and more specifically the way we used it. This has drastically impacted subscription streaming as a whole from the rise in new users to a rise in network problems to deal with those new users. This was reflected in the results of my 12-question survey which showed that women signed up for subscription services at a significantly higher rate at 39.8% compared to men at a 29.9% rate. This was also displayed in the fact that men would cancel their subscription service at a higher rate at 43.3% compared to women at 36.7%.

Basic Sciences

**MMP-13 and Rheumatoid Arthritis: A Story of Modified Collagen Degradation**

By: Julianna Gregory, Dorota Roszyk, Ania Knapinska, Rikard Holmdahl, and Gregg Fields

Faculty Mentor(s): Gregg Fields and Dorota Tokmina-Roszyk

Presenter(s): **Julianna Gregory**

Rheumatoid arthritis (RA) is a debilitating disease that culminates in articular cartilage degeneration where metalloproteinase 13 (MMP-13) is believed to be a major mediator of collagen turnover. One hallmark of RA is the production of abnormal antibodies years prior to degenerative effects on cartilage. To explore the effects of these antibodies on collagen digestion as well as the role generated fragments play in the progression of RA, antibody/collagen samples were treated with MMP-13. Digested samples were then separated using electrophoresis and unique fragments were analyzed and used to design a series of peptides. From five tested antibodies, four showed distinct cleavage patterns that differ from fragments generated by MMP-13 in the absence of antibodies. Furthermore, all collagen/antibody samples tested with MMP-13 resulted in generation of low molecular weight fragments not present in control samples. It can be concluded that in the presence of antibodies MMP-13 generates abnormal cleavage patterns.

Basic Sciences

**Encapsulation of Cromolyn Within Neuroprotective PEGylated Chitosan-Palmitic Acid Nanoparticles**

By: Seymour Haque, Majedul Islam, and Deguo Du

Faculty Mentor(s): Deguo Du

Presenter(s): **Seymour Haque**

Alzheimer's disease (AD) is a disease that lacks effective treatment options. Many hydrophilic drugs, such as cromolyn, can alleviate AD symptoms and induce cognitive benefits. However, cromolyn has poor bioavailability as it cannot cross the blood-brain barrier effectively. Using nanoparticles (NPs) as a drug delivery mechanism can address these issues. In this study, PEGylated cromolyn chitosan-palmitic acid nanoparticles will be formulated. A chitosan-palmitic acid copolymer will be synthesized. A mixture of cromolyn and this copolymer will be prepared and added to an organic surfactant solution containing sodium bis(2-ethylhexyl)sulfosuccinate (AOT), forming reverse micelles. Sodium tripolyphosphate will be added as a cross-linker and the nanoparticles will then be PEGylated via physical adsorption. The purified nanoparticles will then be characterized using AFM as well as DLS. The NPs' entrapment efficiency, drug release profile, and cytotoxicity will be evaluated. Characterization of the copolymer indicates that amide bonds were successfully formed between chitosan and palmitic acid.

Basic Sciences

### **Calcium Carbonate and Hydroxyapatite Biomineralization of Chitin Utilizing TEMPO Oxidation and Poly(acrylic acid) Modification**

By: Edward De La Uz, Jo Laura, and Vivian Merk

Faculty Mentor(s): Vivian Merk

Presenter(s): **Edward De La Uz**

The polysaccharide chitin is found in the natural world as a major component of biominerals, such as mollusk shells, providing mechanical properties such as impressive tensile strength. This research project sought to reinforce mushroom-derived chitin scaffolds with minerals using the introduction of polyanionic functional groups to enhance organic-inorganic mineralizations and achieve a more robust and homogenous mineralization. The minerals reviewed were calcium carbonate and hydroxyapatite, which are commonly found in osseous tissues of different organisms. Using a TEMPO oxidation procedure for calcium carbonate mineralization and poly(acrylic acid) for hydroxyapatite mineralization, more extensive and homogeneous mineral depositions were found in the chitin matrices when compared to non-functionalized controls. XRD, FT-IR, and Raman spectroscopy were used to study the mineral phases, while SEM and AFM microscopy of chitin scaffolds showed enhanced exterior and interior mineralization and a more homogeneous mineral deposition.

Music, Art, Literature, Theater, History & Philosophy

### **Passing as a Double-Edged Sword: Safety and Threat Through Loss of Community**

By: Elizabeth Searles

Faculty Mentor(s): Ashvin Kini

Presenter(s): **Elizabeth Searles**

Passing is the means by which someone will purposefully hide their identity in order to blend in with others, often acting as a source of protection from the threat of targeted violence or a way to gain necessary resources within society. However, while passing may provide this safety for some, it may also result in the loss of community that marginalized groups are able to uniquely find amongst themselves,

brought together by similar background and shared experience. In examining Nella Larsen's 'Passing' and Annie Proulx's "Brokeback Mountain," this paper will establish the ramifications of this loss—especially in consideration to racial identity, queer identity, and the intersection that exists between the two. In considering these nuances in passing, both explicitly and implicitly presented in the texts, I will be able to substantiate my claim of passing as a form of erasure.

Music, Art, Literature, Theater, History & Philosophy

**An Unfinished War - The Lost Cause in the American South**

By: Grant Kaminer

Faculty Mentor(s): Douglas McGetchin

Presenter(s): **Grant Kaminer**

The Civil War concluded in 1865 with Robert E. Lee's surrender to Ulysses S. Grant at Appomattox Court House. Schoolchildren are taught this information from a very young age, but what they are not necessarily taught about is the Lost Cause. The Lost Cause emerged in the former Confederacy after the conclusion of the Civil War, that attempted to rewrite the narrative and also explain why the South had lost the Civil War. The Lost Cause is an extremely distorted idea, and this presentation will offer insight into the Lost Cause, to show that specific setpoints regarding the Lost Cause are nothing by fantasy.

Music, Art, Literature, Theater, History & Philosophy

**A Historical Overview of Freedom Uprisings and Revolts: Who Was Shivaji of Maratha, Who Did He Rebel Against and What Did He Establish?**

By: Stefan Tsapenko

Faculty Mentor(s): Doug McGetchin

Presenter(s): **Stefan Tsapenko**

India, South Asia, has long been plagued with religious and cultural struggle, a struggle which breeds potent leaders who bring their people out of misery. One such leader for the Hindu people was Shivaji Bhonsale I, otherwise known as Chhatrapati Shivaji Maharaj. Shivaji lived, fought, and died for the betterment of his people, the Marathas. Shivaji's genius is not lost on modern historians, and he is considered one of the greatest Maratha leaders of all time. During his time, Shivaji was largely regarded by his enemies as a sort of "mountain bandit" who opposed their rule. In my research I argue that this understanding is wrong, and that instead Shivaji was a heroic figure. Shivaji's rebellious campaigns against the Bijapur Sultanate and Mughal Empire, coronation as the first Chhatrapati of Maratha, and construction of the Maratha fleet created the Maratha empire which outlasted its foes and defines India's classic history.

Music, Art, Literature, Theater, History & Philosophy

**The Queer Experience: A Critical Commentary on the Effects of the Heteropatriarchy on LGBTQ+ Main Characters in Coming of Age Novels**

By: Shiloh Romero  
Faculty Mentor(s): Ashvin Kini  
Presenter(s): **Shiloh Romero**

This thesis is a critique on the characterization of queer young adults as main characters in coming-of-age novels over the last forty years, and how the heteropatriarchal stereotypes have altered their portrayal, with an emphasis on erasure. The consumption of white heterosexual masculinity in literature is inevitable as these hegemonic norms dominate western culture; in tandem with such a parochial perception of representation, there has been an incredible erasure of intersectional identities, even within the genre of LGBTQ+ literature. This thesis demonstrates how it exacerbates the potentially devastating consequences of hegemonic fiction. To illustrate this, a close reading analysis on "Call Me by Your Name" by André Aciman and "Last Night at the Telegraph Club" by Malinda Lo will be presented to offer a critical commentary of the effects of these stereotypes in juxtaposition to how the novels interact with race, class, gender, and sexuality.

Music, Art, Literature, Theater, History & Philosophy

### **The Selective Enforcement of Criminal Laws on Dueling in Early Modern England**

By: Benjamin Cohen  
Faculty Mentor(s): Ben Lowe  
Presenter(s): **Benjamin Cohen**

The concept of "honor" was prevalent in early modern England, and a duel was often used to settle disputes or perceived slights to honor. With most historiography on dueling focused on its connection to reputation and honor, there has been little attention to legal issues surrounding the practice. This research aims to address this gap in the scholarship through an examination of criminal court records between 1660 and 1720. It will demonstrate that the criminal laws on dueling were selectively enforced, and when these laws were not enforced, it was often related to the participants' social class. The conclusion argues that in early modern England, members of the upper classes were subject to more stringent enforcement and penalties for dueling. In contrast, courts often acquitted members of the lower classes or gave different punishments than the law prescribed.

Business, Marketing, Finance & Public Administration

### **The Power of Party over Purchasing Plans**

By: David Hayes  
Faculty Mentor(s): Monica Escaleras  
Presenter(s): **David Hayes**

As home prices rise, Americans looking for a home are faced with a difficult question: as prices increase, is it better to buy or rent? According to my survey, Americans believe it's better to buy. With this in mind, I wanted to find out how political affiliation influences purchasing decisions. To find out, I wrote a survey using Survey Monkey and gathered 200 responses from Americans over 18 using



Amazon M-Turk. While the results showed that about 67% of all parties think it's better to buy than rent in the current market, their actual likelihood of buying tells a different story. Surprisingly, 50.8% of Republicans were very likely to buy a home this year compared to only 37.2% of Democrats, which is statistically significant at the 1% level. This stark difference between parties' short-run plans is surprising and can be used to garner support for housing-related policy in the future.

Business, Marketing, Finance & Public Administration

### **Tipping Culture in America**

By: Taylor Youngblood

Faculty Mentor(s): Eric Levy and Monica Escaleras

Presenter(s): **Taylor Youngblood**

In America, there is a striking escalation of tipping in coffee shops, restaurants, salons, and more. This common etiquette has strong controversy on its necessity and effect. The purpose of this study is to analyze people's views on tipping. I believed that there would be more agreement about tipping among the older generations. To test my hypothesis, I wrote a survey of 15 questions and collected the data through Survey Monkey and Amazon Mechanical Turk with the sample for the analysis consisting of 196 participants over 18 years of age. The results demonstrated a surprising and intriguing correlation among the participants' gender and age and how that affected their idea of the amount and necessity of tipping. This survey can help to understand consumers and the reasoning for the amount of gratuity they leave behind.

Business, Marketing, Finance & Public Administration

### **Is the Student Loan Forgiveness Plan Fair?**

By: Adam Trout

Faculty Mentor(s): Monica Escaleras

Presenter(s): **Adam Trout**

Recently, President Joe Biden signed an executive order forgiving student loan debt for eligible students. People are eligible for between \$10,000 and \$20,000 based on the types of federal loans. The goal was to discover the public's opinion of fairness on this executive order. My hypothesis was that Democrats would support the bill more than Republicans and Independents. To test my hypothesis, a survey was created with the data being collected through Amazon Mturk. The survey consisted of 197 participants from Americans aged 18 and older. For the question of fairness for students who have paid off their debt, Republicans and Independents disagree more with fairness than Democrats. Republicans disagreed 12.2% and Independents disagreed 24.2% compared to Democrats disagreeing with 0.9%. This is statistically significant at the one percent level. Americans are more likely to support this executive order and other similar orders.

Business, Marketing, Finance & Public Administration

### **How Social Media Has Impacted the Perception of Investing**

By: Ivan Yuk

Faculty Mentor(s): Monica Escaleras and Eric Levy

Presenter(s): **Ivan Yuk**

There has been a surge of interest in investing after the COVID-19 pandemic, which is attributed to the rise of trading platforms such as Robinhood. Social media platforms have significantly increased public interest in investing, such as the GameStop short squeeze. This propelled other social media platforms like Instagram and TikTok into the investing sphere. The purpose of this study is to analyze the impacts of social media on investing trends and investor sentiment. To do this, I conducted a 16-question survey through Amazon Mechanical Turk. Then, I ran statistical analysis and crosstabulation in order to identify if there was any statistically significant difference with gender and age. I found that younger individuals have a positive view on how social media impacts their financial literacy. I also see a statistically significant difference in the responses of males and females, with more males investing than females due to social media.

Business, Marketing, Finance & Public Administration

### **Americans' Opinions on Organized Labor**

By: Mikhail Perminov

Faculty Mentor(s): Monica Escaleras and Eric Levy

Presenter(s): **Mikhail Perminov**

There has been somewhat of a renewed interest in organized labor recently, which my survey analyzed. I hypothesized that opinions on organized labor would differ based on political party and occupation. Therefore, my hypothesis put forth that people who identified as Republican would be more averse to organized labor, and that employers would hold negative views on unions. To test this hypothesis, I wrote a fourteen-question survey using Survey Monkey and received data from people across the United States using Amazon Mechanical Turk. As expected, my results showed that there was a high correlation between peoples' opinions on organized labor and occupation. Political party was also important: Democrats and independents were more likely to say that unions should have more power. However, the occupation of a person was the most important factor when it came to their opinion on organized labor. As politics and economics change, so will this data.

Classroom Research Project/Assignment

### **Wall Street Journal Case Study: Targeting Generation Z**

By: Cameron Cisewski, Casey Morgan, Madyson Puchajda, Ashton Rodrick, Anna Simonson, and Caitlin Troxell

Faculty Mentor(s): Eileen Acello

Presenter(s): **Caitlin Troxell**, Casey Morgan, Ashton Rodrick, Anna Simonson, Cameron Cisewski, and Madyson Puchajda

Florida Atlantic University had the honor of participating in the American Marketing Association's case competition for the third year in a row. This year's sponsor was The Wall Street Journal (WSJ), a pioneer in the wildly competitive journalism industry. The WSJ gave us three objectives to increase brand awareness, generate higher conversion rates, and build retention. Before we created our plan, we conducted extensive primary research to identify perceptions of WSJ. We conducted social listening on various social media platforms, conducted two student focus groups, interviewed educators from multiple colleges and professionals from career services, and surveyed 380 students and 70 educators. With this research in mind, we curated a marketing plan for WSJ to help promote brand awareness, express benefits offered, drive subscription purchases, and improve the user experience. Via our IMC plan, WSJ will be able to improve its growth, engagement, and retention rates among college students.

Classroom Research Project/Assignment

**Assessing the Benefits of Two Problem-solving Courts for Clients Seeking to Make a Change: An Exploratory Study**

By: Briana Thomas and Lincoln B. Sloas

Faculty Mentor(s): Lincoln Sloas

Presenter(s): **Briana Thomas**

Problem-solving courts, such as drug courts, are presented as an alternative form of sanctioning for people with substance use issues. This type of approach is significant as it places emphasis on therapeutic jurisprudence, (i.e., using the law in a therapeutic way) for clients to rehabilitate themselves and become a productive member of society. The purpose of my research is to compare and contrast two types of problem-solving courts, one drug and one veteran, to assess how both courts utilize the therapeutic jurisprudence framework. This qualitative study includes court observations conducted at Palm Beach County, and interviews with drug and veteran court team members. The results from the study indicate that a non-adversarial approach, mentorship, motivation, and court members interaction with the participants led to a better experience for clients. Thus, increasing their ability to succeed in the program. Policy implications will be discussed.

Cross Disciplinary Projects

**Hoover Damage: Queer Erasure, the Federal Bureau of Investigation, and the Age of McCarthyism**

By: Connor J. Birkhimer

Faculty Mentor(s): Douglas McGetchin

Presenter(s): **Connor Birkhimer**

A discussion of the impact that J. Edgar Hoover, the first head of the FBI, had on gay, lesbian, bisexual, and transgender livelihoods in the early 1950s. The research will conclude that McCarthyism and the FBI's direct involvement in queer activism directly pushed the gay liberation movement back by decades. The research will further argue that starting in 1950, the Federal Bureau of Investigation used the guise of anti-Communism to eradicate queer visibility, inclusion, and acceptance in the United

States. The gay liberation movement of post-World War II was infiltrated, surveilled, and documented heavily under the premise of anti-Communism, and J. Edgar Hoover's motivations were based almost entirely on the social fears and stigma surrounding both Communists and queer Americans. Hoover's conflation of the two did severe damage to gay liberation and minimal damage to any alleged Communist activity happening in the United States.

Cross Disciplinary Projects

### **Purchasing Intent of Electric Vehicles**

By: Anthony Beltran

Faculty Mentor(s): Monica Escaleras

Presenter(s): **Anthony Beltran**

With electric vehicles projected to make up to 13% of all new car sales in 2022 according to the electric vehicle initiative outlook report of 2022, they are said to be a revolutionary step in transitioning to a greener planet with less dependence on fossil fuels. However, there has been heavy debate on electric vehicles and whether they benefit the environment and the overall vehicle market. How likely are people to buy an electric vehicle? In what way will the perspectives on predicted vehicle trends affect vehicle markets? After collecting data from 197 individuals, the results show that there is a statistically significant difference between age and the likelihood for purchasing an electric vehicle. In addition, there is a statistically significant difference between party affiliation and how likely they are to stop using gas powered vehicles if gas prices were to continue to rise.

Cross Disciplinary Projects

### **The Future of Assisted Suicide in the U.S**

By: Mya Barsoum

Faculty Mentor(s): Eric Levy and Monica Escaleras

Presenter(s): **Mya Barsoum**

In the United States, 10 states have legalized physician-assisted suicide for individuals diagnosed with terminal illnesses. This prolongs the debate among Americans on whether physician-assisted suicide should be a constitutional right or not which is a current controversy in the nation. The purpose of this study is to examine Americans' views on whether physician-assisted suicide should be legal or illegal. I hypothesized that there is a difference in opinions regarding who is more accepting of physician-assisted suicide than those who are against the process based on gender, age, and political party. To test this, I conducted a 15-question survey using Survey Monkey and Amazon MTurk. My sample consists of 193 respondents in the United States over the age of 18. I found a statistically significant difference regarding physician-assisted suicide on gender, party affiliation, and age. In conclusion, a vast majority of recipients support the idea of physician-assisted suicide.

Engineering

### **Picking Machine**

By: Trevor Nykanen, Gabriella Hebert, Michael Forrest, Dailianny Villanueva, Jovani Irizarry, Preston Sarlo, and Andrew Scabello

Faculty Mentor(s): Oscar Curet Erik Engeberg

Presenter(s): **Jovani Irizarry**, Michael Forrest, Gabriella Hebert, Trevor Nykanen, Dailianny Villanueva, Preston Sarlo, and Andrew Scabello

The primary purpose of this project is to develop an autonomous picking solution that increases the efficiency of the current manual picking processes. The design stems from two main systems. System one is the picking apparatus, and system two is the shelving unit. The overall design relies on the basis of automated functionality, with minimal human-aided input. Due to this, the picking apparatus will use a vacuum picking tool to select the items needed from the shelves. The program for this design is also directly tied to the picking apparatus. The program keeps track of current stock and confirms when an item has been successfully selected. Overall, each of these systems will work in unison to improve the efficiency of existing manual picking procedures.

Engineering

### **Natural Seawater for Carbon Capture and Storage with Waste Concrete Catalysts**

By: Sofia Wiskoff and Samantha Collie

Faculty Mentor(s): Myeongsub Kim

Presenter(s): **Sofia Wiskoff** and Samantha Collie

Carbon capture and storage (CCS) is vital for mitigating the pressing issue of global warming. Traditional CCS have drawbacks, including freshwater consumption, severe toxicity, and high operation costs. This research presents an environmentally-conscious CCS method using seawater and waste concrete, alleviating the dilemma of traditional CCS methods. Combined microfluidic spectroscopic techniques were utilized to evaluate waste concrete's catalytic effect of CO<sub>2</sub> dissolution in seawater. The pH change due to CO<sub>2</sub> dissolution in seawater was measured to estimate the CO<sub>2</sub> dissolution rate, which showed that adding concrete to seawater increased the CO<sub>2</sub> dissolution rate and dissolved more CO<sub>2</sub> compared to seawater alone. The dissolved CO<sub>2</sub> dissociates and bonds with calcium ions supplied from waste concrete, precipitating as CaCO<sub>3</sub>. The carbonate precipitate was found to have a beneficial structure for many aquatic processes.

Environmental, Ecological & Marine Sciences

### **Demographic Profile of the FAU Gopher Tortoise Preserve - 11 Years Later**

By: Rachel Starck

Faculty Mentor(s): Evelyn Frazier

Presenter(s): **Rachel Starck**

Gopher tortoises (*Gopherus Polyphemus*) are a keystone species that play a large role in their ecosystem. Florida Atlantic University Gopher tortoise population inhabits approximately 90 acres of grassy and disturbed scrub habitats. In 2011 the gopher tortoise population was assessed and

approximately 199 active burrows were measured. The habitat has undergone management by FAU that includes using chemical herbicides, bush hogging, and mowing to improve the habitat quality for the burrowing owls and gopher tortoises. This study consists of a reassessment of the gopher tortoise population 11 years later to evaluate whether the population has grown. Between the months of May and October 2022 we found 344 active burrows which is an increase of 145 burrows. Assessing whether the population is healthy and reproducing is important because gopher tortoises are ecosystem engineers and act as a framework for many commensal species that live in or around the burrows.

Environmental, Ecological & Marine Sciences

### **Exploring the Relationship Between the South Florida Burrowing Owl and Gopher Tortoises on the FAU Campus**

By: Martha Torres, Lauren Melanson, and Evelyn Frazier

Faculty Mentor(s): Evelyn Frazier

Presenter(s): **Martha Torres**

*Athene cunicularia floridana*, or the Florida burrowing owl, is an ecosystem engineer. The population has been declining due to urbanization in south Florida. Due to the scarcity of land available, they inhabit ruderal areas such as parks and airports. The gopher tortoise is a keystone species or a species that many other species depend upon. Previous literature shows cohabitation between gopher tortoises and other species, but little is known about the interactions, specifically with burrowing owls. Burrowing owls have been observed to take over gopher tortoise burrows after they are abandoned at the FAU Preserve. We placed cameras at 3 burrows where burrowing owl activity has been known to take place and found evidence of the two species co-occurring as well as using the burrows interchangeably. Our research will provide insight into understanding the relationships between the two species, and what impact this behavior has on each species.

# Poster Presentations

## Organized by Poster numbers:

- Odd numbers Poster Session I (morning)
- Even numbers Poster Session II (afternoon)

Poster - morning

Basic Sciences

### **1. Obtaining High Quality Western Blots in Minimal Time Through Optimized Western Work Flow**

By: Emilia Paleta-Palamarchuk and Elizabeth Yamin

Faculty Mentor(s): Shailaja Allani

Presenter(s): **Emilia Paleta-Palamarchuk** and Elizabeth Yamin

Western blotting is a molecular biology technique for studying protein expression. Our objective is to optimize the workflow using the newest machinery from Invitrogen and Licor for classroom laboratory use. The optimized workflow involves Invitrogen Mini gel tank to run SDS-PAGE gels; Power blotter XL to transfer proteins from gels to nitrocellulose membranes; iBind Flex for primary and secondary antibody incubation, and Licor Odyssey XF digital imager for imaging the chemiluminescent blot, which all aid in maximizing efficiency of the process. Our experiments showed that the power blotter could effectively transfer proteins in 7 minutes rather than 2 hours or overnight transfer, and the iBind could complete antibody binding and washing in under 3 hours. The Licor imager images and analyzes the blot in minutes with simple software. With this improved workflow we were able to cut the required time to produce western blots from 20 hours to 4 hours.

Poster - afternoon

Classroom Research Project/Assignment

### **2. There's No Place Like the Forgetful Home: The Erasure of Black Lesbian Feminists from Queer and Feminist "Safe Spaces"**

By: Taylor Pack

Faculty Mentor(s): Ashvin Kini

Presenter(s): **Taylor Pack**

My research seeks to explore the erasure of Black and Brown lesbianism from feminist and LGBTQ+ activism and spaces, especially as it pertains to the intersectionality of lesbians' identities such as gender, class, and race; as well as the harmfulness that occurs when lesbianism is understood as tantamount to male gayness, and the erasure of experiences and loss of agency that is a result of doing

so. My primary sources are Audre Lorde's biomythology, 'ZAMI', and her essay 'The Transformation of Silence into Language and Action'. These texts provide a crucial perspective for the analysis of black lesbian feminists' value to both feminism and queer culture and literature despite them being underrepresented and underappreciated in the institutions and communities of which they are members.

Poster - morning

Behavioral, Educational & Social Sciences

### **3. Implications of Breaks from Fostering on Foster Parent's Perceived Satisfaction, Challenges, and Intent to Continue Fostering**

By: Morgan Cooley and Grace Molinaro

Faculty Mentor(s): Morgan Cooley

Presenter(s): **Grace Molinaro**

Foster parents play an important role within the foster care system but also face multiple challenges or stressors due to the demands of providing care to children within the context of the foster care system. This quantitative research study investigated whether there was a significant difference between foster parents' perceived satisfaction with fostering, challenges with fostering, and intent to continue fostering among those who have taken a break from fostering and those who have never taken a break from fostering. Results of chi-square tests indicate that there were no significant differences noted. Implications for future research and practice will be presented. This research provides some context for supporting foster parents who may be at risk of burnout or quitting fostering.

Poster - afternoon

Health & Medical Sciences

### **4. Development of Wearable Biomedical Device for Detection of Wrist Dorsiflexion/Palmar Flexion Affecting Median Nerve and Transverse Carpal Ligament in Patients with Carpal Tunnel Syndrome**

By: Rachel Kavalakatt

Faculty Mentor(s): Monica Maldonado

Presenter(s): **Rachel Kavalakatt**

Carpal tunnel syndrome (CTS), a peripheral neuropathy affecting over 62% of pregnant women annually, is caused by compression of the median nerve and is characterized by pain and weakness in the wrist and hands. This inhibits the range of motion and prevents patients from performing daily repetitive tasks. Current solutions include wrist splinting, which is restrictive and bulky, steroid injections, or carpal tunnel release surgery, which are invasive and carry the risk of complications. I designed a wearable, cosmetically appealing biomedical device composed of a wristband and ring set that prompts users to maintain a neutral wrist position while allowing a comfortable range of motion.



The design collects inertial data and provides instantaneous biofeedback signals when excessive wrist dorsiflexion/palmar flexion is detected. This product will improve patient quality of life by allowing freedom of movement and comfort, accurate detection of harmful wrist movement, and real-time monitoring and management of CTS.

Poster - morning

Engineering

### **5. A Plant-Derived Polyphenolic Coating on Decellularized Porcine Bone Matrix to Promote Human Osteoblast Cell Proliferation**

By: Sabrina Scarpinato, Jordan Brennan, and Yunqing Kang

Faculty Mentor(s): Yunqing Kang

Presenter(s): **Sabrina Scarpinato**

Decellularized bone matrixes (DBM) have been widely used to support osteoblast cells to grow bone tissue. However, bone regeneration ability of DBM is still not satisfactory. To enhance its function, we loaded natural biopolymer, Tannic acid (TA), and inorganic magnesium ions ( $Mg^{2+}$ ) onto porcine derived DBMs. The DBM was prepared by a modified decellularization protocol. We then used a simple and versatile coating method to rapidly coat TA and  $Mg^{2+}$  on the DBM. We found that the decellularization protocol can effectively decellularize porcine bone to obtain DBM, and the coating method effectively coated TA and TA/ $Mg^{2+}$  on the DBM. In vitro cell study showed that DBM coated TA/ $Mg^{2+}$  significantly promoted cell growth of human osteoblast cells compared to non-coated DBM. This preliminary data showed that the DBM scaffolds with TA and TA/ $Mg^{2+}$  coating can have potential to promote the growth of bone cells, which brings promise for bone tissue regeneration.

Poster - afternoon

Behavioral, Educational & Social Sciences

### **6. How Integration of Past Relationship Affects Current Relationship**

By: Kaylah Scott, Morgan Cope, and Michael Maniaci

Faculty Mentor(s): Michael Maniaci

Presenter(s): **Kaylah Scott**

In romantic relationships, partners tend to include others in the self to form a sense of interpersonal interconnectedness (Aron, Aron, & Smollan, 1992). This happens to a greater extent for those who have an anxious attachment style (Slotter & Gardner, 2012). As a relationship dissolves partners lose their sense of themselves due to this merging of self identity being lost (Cope & Mattingly, 2020). Residual cognitive interdependence with previous partners might affect the satisfaction with a current partner. The current study investigates whether identity integration with a previous romantic partner affects current relationship outcomes (e.g., satisfaction with the current partner). Effects of residual

partner integration on individual difference measures such as self-concept clarity and attachment style will also be explored.

Poster - morning

Environmental, Ecological & Marine Sciences

### **7. Grow With the Flow: Variation in Shark Vertebral Morphology Across Body Regions and Ontogeny**

By: Monique Oliveira, Emma Pawlik, Sonoma Arnaldy, Jamie Knaub, and Marianne E. Porter

Faculty Mentor(s): Marianne Porter

Presenter(s): **Monique Oliveira**

To swim, sharks produce thrust via lateral oscillations of the main body axis, the vertebral column, which is comprised of mineralized cartilage. As sharks grow, more thrust is required to propel a larger mass through the water. The internal vertebral morphology may vary along the column to withstand increased loading forces as the shark grows. Here, we examined vertebral morphology across ontogeny and body regions in sharks from Order Carcharhiniformes. Using computed tomography imaging, we quantified 3D structure across vertebral regions (anterior, middle, and posterior) and three body sizes in four species of shark (*Carcharhinus brevipinna*, *Carcharhinus limbatus*, *Carcharhinus obscurus*, and *Prionace glauca*). We measured angles for dorsal, lateral, and ventral wedges of mineralized cartilage and found that middle and posterior vertebrae were more similar compared to anterior vertebral morphology. This study improves our understanding of the form-function relationship in mineralized cartilage during growth.

Poster - afternoon

Behavioral, Educational & Social Sciences

### **8. Examining Parental Divorce In Adult Relationship Processes: A Scoping Review**

By: Destiny Fava, Morgan Cope, and Michael Maniaci

Faculty Mentor(s): Michael Maniaci and Morgan Cope

Presenter(s): **Destiny Fava**

Emerging research has explored parental divorce's various effects on adult romantic relationships. This scoping review provides a thematic analysis of the current literature on the adult population, specifically focusing on adaptive cognitive behaviors in a romantic context. A systematic search was conducted across Google Scholar, Taylor & Francis Online, and ProQuest using a combination of keywords (e.g., parental divorce, adult children, etc.). The initial search was paired with a reference search and a cross-reference platform. The initial pool from the search resulted in 465 articles after accounting for replicated articles; initial screening left 86 articles. The remaining articles were rescreened as part of the protocol before content data extraction resulting in the articles reviewed

herein. Studies revealed various qualitative and quantitative methods to investigate parental divorces, such as commonly used scales and interview structures. Results identified the fields' trajectories and available literature gaps.

Poster - morning

Health & Medical Sciences

### **9. Neighborhood Greenspace and Neighborhood Income Associated with Brain Imaging Changes in Older Adults: The Cardiovascular Health Study**

By: Lilah Besser, Gina Lovasi, Joyce Jimenez Zombrano, Simone Camacho, Devi Dhanekula, and Yvonne Michael

Faculty Mentor(s): Tricia Meredith and Lilah Besser

Presenter(s): **Devi Dhanekula**

Living in neighborhoods with more greenspace (areas with natural vegetation) is associated with better cognition and slower cognitive decline in later life. We examined whether a combined measure of greenspace and neighborhood median household income was associated with changes in white matter hyperintensities (WMH) and ventricle size on serial magnetic resonance imaging (MRI).

Understanding this interaction is crucial to inform future greenspace interventions, particularly those targeting neighborhoods with greater levels of disadvantage. We used longitudinal, observational data on 1,260 cognitively normal  $\geq 65$ -year-old participants from the Cardiovascular Health Study who had 2 MRIs (~5 years apart) and greenspace data at the initial MRI. Multivariable logistic regression with generalized estimating equations tested associations between neighborhood greenspace and income variables and dichotomized MRI measures. The combination of less neighborhood greenspace and lower neighborhood socioeconomic status was associated in older adults with worsening white matter grade over time.

Poster - afternoon

Classroom Research Project/Assignment

### **10. A 3D-Based Framework Using Artificial intelligence for Biomechanical Analysis in Orthopedic Practice**

By: Arjun Doshi, Ayush V. Gowda, Harshal A. Sanghvi, and B. Sue Graves

Faculty Mentor(s): B. Sue Graves and Harshal Sanghvi

Presenter(s): **Arjun Doshi** and Ayush Gowda

This research aims to improve clinical performance monitoring in adhesive capsulitis patients using Artificial Intelligence to track and record their movements. The procedure will utilize motion capture systems and imaging to enhance recovery speed. By using a Machine Learning application, users see a live display of themselves, enabling the healthcare provider and recipient to improve physiotherapy programs. The application will be developed using videos of exercises and an AI component to map

movements. Previous experiments have shown the potential of IMU-based imaging to improve recovery speed for adhesive capsulitis injuries (an inertial measurement unit is an electronic device that measures and reports a body's specific force and angular rate), and MRI-compatible motion capture systems have been used for the patellofemoral joint. This research is important as it can potentially boost injury recovery times, provide a convenient method of improving physiotherapy programs, and enhance the overall quality of care for patients.

Poster - morning

Basic Sciences

### **11. Exploring the Potential Antibacterial Effects of Native Floridian Weeds**

By: Natasha Mayorga and Daniela Scheurle

Faculty Mentor(s): Daniela Scheurle

Presenter(s): **Natasha Mayorga**

The reproductive cycles of bacteria occur very rapidly compared to mammalian cells; thus, bacteria acquire mutations that increase survival ability in a given environment relatively quickly. This has led to the phenomenon of antibiotic resistance, which greatly impedes antibiotic development, as bacteria eventually adapt to survive in many previously effective antibacterial substances. In this search for new and efficient antibiotics, the abundant and diverse plant group commonly referred to as weeds is often overlooked. A preliminary examination of select Floridian weed extracts revealed significant bacteriostatic effects of methanolic *Callisia repens* extracts – a perennial plant that characteristically suffocates other plants due to rapid growth and high environmental tolerance. These promising results have now prompted a more thorough investigation of the presence, chemical nature, and biological activity of compounds in crude extracts. Cross referencing existing information regarding bactericidal phytochemicals with those extracted can then elucidate the mechanisms behind observed antibacterial effects.

Poster - afternoon

Environmental, Ecological & Marine Sciences

### **12. The Impact of Perigean Tides and Spring Tides on Beach Morphology in Boca Raton, FL**

By: Allyson Wleklinski, Leanne Hauptman, and Tiffany Roberts Briggs

Faculty Mentor(s): Tiffany Roberts Briggs and Leanne Hauptman

Presenter(s): **Allyson Wleklinski**

Perigean spring tides are associated with some of the highest tides of the year which can cause coastal flooding. This study examines the influence of perigean spring tides impact to beach morphology in Boca Raton, Florida. We anticipate perigean tides will have a stronger impact and push beach sediment further inland, thus flattening the coast due to the increased flooding. NOAA historic tidal datasets and Florida Atlantic University, Coastal Studies Laboratory beach profile data were analyzed to

evaluate morphological change by comparing water levels and cross-sectional beach profiles for both perigean spring tides and spring tides during 2022. Results from this study will aid in understanding the influence perigean spring tides has on local beach morphology which can assist in future prediction of rising sea levels and impacts to coastal communities.

Poster - morning

Basic Sciences

### **13. How Fast is Too Fast? — Studying B-Hairpin Peptide Degradation by Enzymatic Proteolysis**

By: Hamza Hanafi, Lien Leminh, Sarah Naylon, and Stephane Roche

Faculty Mentor(s): Stephane Roche

Presenter(s): **Hamza Hanafi** and Lien Leminh

B-hairpins have recently emerged as proteinomimetic scaffolds that hold much significance in drug discovery campaigns as novel and effective protein-protein interaction (PPI) inhibitors. These structures have been of particular interest for miniaturizing monoclonal antibody drugs into smaller hairpins that can inhibit the binding of lymphocyte programmed cell death-1 (PD-1) receptors to their cognate ligand (PD-L1). This has proven efficient to restore an immune response against a number of tumor types with promising biological activity (IC<sub>50</sub> of 50-300 nM). However, data about the susceptibility of PD-1/PD-L1 immune checkpoint inhibitor hairpins to proteolytic degradation is currently quite sparse despite it being a necessary obstacle to overcome when developing potential drugs. Here we report a method for quantitatively assessing the degradation of various synthetic B-hairpins peptides using protease assays monitored by reverse-phase high-performance liquid chromatography (RP-HPLC).

Poster - afternoon

Health & Medical Sciences

### **14. Developing an Image Processing Algorithm for Analyzing of FDG-PET in Patients with AD**

By: Mary Adam, Vishala Ramdin, Alexandra To, Giselle Shim, Rudolf Hall, Ahjanae Jones, Carol Aziz, Ibrahim M. Shokry, and Rui Tao

Faculty Mentor(s): Rui Tao

Presenter(s): **Mary Adam**

<sup>18</sup>F-fluorodeoxyglucose (FDG) is a radiotracer used in positron emission topography (PET) for estimating a degree of hypometabolism in the brain of patients with Alzheimer's disease (AD). Compared to healthy subjects, AD patients demonstrate ~20% of reduction in metabolic activity as revealed by a pharmacokinetic test; however, this is not applicable in clinical practice. Therefore, alternative testing methods are urgently needed. Recently, a standardized uptake value ratio (SUVr)

was proposed as an image processing algorithm to estimate changes in metabolism, however, SUVr cannot meet the level of hypometabolic criteria shown by the pharmacokinetic tests. In contrast, we created an algorithm that could consistently reveal ~20% of the reduction in metabolic activity in the AD brain. In conclusion, our algorithm likely paves a new way to substitute the pharmacokinetic analysis for estimating metabolic activity in the AD brain.

Poster - morning

Engineering

### **15. Optimization of Particle-Particle Interactions during Particle Settling for Shale Gas Operations**

By: Ella Bethke, Kostiantyn Ostapchuk, Mazen Hafez, and Myeongsub Kim

Faculty Mentor(s): Myeongsub Kim

Presenter(s): **Ella Bethke**

To execute the process of hydraulic fracturing, a slurry of fluid and proppant is injected into cracks to ensure they remain open for extraction. Observation of gravitational settling of particles provides a beneficial understanding of the efficacy of this process. This study aims to provide such insight and observes the settling of two particles in fluid as they are released from PMMA channels via DC motor movement. Particle paths through fluid are captured via high-speed camera as they are released into a PMMA Hele-Shaw cell. Various fluids are utilized, as well as a suspended mixture of silica nanoparticles. Observation of dual particle interaction while settling will be used to determine the most effective fluid to utilize for hydraulic fracturing. This project will build on a previous study in conjunction to further investigate particle settling in solutions of glycerol and water with various ratios of both components.

Poster - afternoon

Engineering

### **16. Development of 3D-Printed Structural with Heterogeneous Embedded Sensors**

By: Dana Smith

Faculty Mentor(s): Jinwoo Jang

Presenter(s): **Dana Smith**

On June 24, 2021, at approximately 1:25 A.M., the east wing of the Champlain South Tower, located at 8777 Collins Avenue, Surfside, Miami, partially collapsed. This collapse has triggered concerns within structural health monitoring (SHM). Engineers have considered implementing technology such as the Internet of Things (IoT) and Artificial Intelligence (AI) into structures to aid SHM. Implementing such technology would help engineers in observing the health of a building, quickly finding issues with structures, and finding solutions to problems as they arise. This project aims to 3D-printed replicas of actual structures, mimicking the building's physical properties. Each 3D-printed

structure will be tested using a vibrating table and distance sensors to test the dynamic properties of the replicated structures. This project intends to provide and further building-information data generated from the 3D-printed replicas.

Poster - morning

Environmental, Ecological & Marine Sciences

### **17. Analyzing the Effects of Stress on the Sexual Ornamentation, Gut Microbiome, and Cognition of Songbirds**

By: Joseph Swaress, Diego Avendano, Morgan Slevin, and Rindy Anderson

Faculty Mentor(s): Rindy Anderson

Presenter(s): **Joseph Swaress** and Diego Avendano

Our project addresses the question of how stress impacts the characteristics of the gut microbiome, which may consequently impact health and other traits important to survival and reproductive success in animals. Specifically, we will test the hypothesis that stress has negative effects on the gut microbiome, which in turn has negative effects on body mass, cognition, and sexual ornamentation in songbirds. Social isolation will be used as an experimental treatment to induce mild but chronic stress in captive zebra finches. Zebra finches are gregarious, and social isolation has been documented in this species as a moderately stressful stimulus. Social isolation is a biologically relevant treatment because it happens stochastically to individuals in populations of gregarious species and it mimics times when wild animals are admitted to wildlife hospitals or raised in captive breeding programs. We will be presenting preliminary results and discussion on the beak ornamentation and cognitive performance data.

Poster - afternoon

Engineering

### **18. Dielectrophoresis-Based Microfluidic Cell Sorter for Malaria Diagnostics**

By: Joshua Donjuan, Oladiran Oladokun, and Darryl Dieujuste

Faculty Mentor(s): Sarah Du and Darryl Dieujuste

Presenter(s): **Joshua Donjuan**

Malaria, a deadly disease caused by parasites invading and remodeling red blood cells. A majority of malaria deaths are found in children under the age of 5 years old and pregnant women in endemic areas. In 2020 there was an estimated 241 million cases worldwide. Accurate and early diagnosis of the disease can lower the risk of mortality and fight against the development of antimalarial drug resistance. To do this microfluidics and the phenomenon known as dielectrophoresis is used to sort red blood cells based on whether they are infected or not. A Multiphysics simulation of a 2D model is made in COMSOL to aid in designing the device and proper test conditions. A combination of laminar flow and dielectrophoresis force is demonstrated to enable a continuous sorting of infected

cells from other blood components. The goal of the research is to develop a point-of-care diagnosis from a finger prick.

Poster - morning

Environmental, Ecological & Marine Sciences

**19. Untangling the Mysteries of “Complex Song” in Bachman’s Sparrow (*Peucaea aestivalis*)**

By: Helen Rodriguez, Anjali Kannan, Anya Sabourova, Hans Gozembach Kayser, and Rindy Anderson

Faculty Mentor(s): Rindy Anderson

Presenter(s): **Helen Rodriguez**, Anjali Kannan, and Anya Sabourova

Songbirds produce different vocalizations to convey information to receivers. Primary songs function to attract females and defend territories. Complex song is a different song that has a different acoustic structure. The social function is unknown and few studies of its acoustic structure exist. It’s unknown if complex song is sung the same way each time or if it varies with each rendition. To answer this, we will create a note type library of complex songs using the web-based software “Koe.” Koe will allow us to examine the sequence of notes produced during each rendition, which will allow us to quantify within- and among-individual variation. We will determine which note types are most common and most rare in the complex songs in our population. Our results will build foundational knowledge about the acoustic structure of this song and will contribute to our understanding of the drivers that shape these songs.

Poster - afternoon

Environmental, Ecological & Marine Sciences

**20. Song Type Similarity as a Function of Distance in Male Bachman’s Sparrows**

By: Melanie Garmendia, John Whu, Rylei Harper, Heather Wolverson, and Rindy Anderson

Faculty Mentor(s): Rindy Anderson

Presenter(s): **Melanie Garmendia**, John Whu, and Rylei Harper

Vocal communication plays a significant role in the social behavior of songbirds. During song learning, some song types may be memorized incorrectly. This can cause slight differences in the vocal characteristics of song types across a population, especially at increased distances. In this project, we have examined songs among male Bachman’s Sparrows (*Peucaea aestivalis*) to determine if song similarity decreases as distance increases. We uploaded songs from previous field recordings onto an online bioacoustics program, Koe, and analyzed them at a syllable level for variance. Using an ordination technique, we ran a principal components analysis to evaluate similarity across individuals. Due to environmental factors and barriers, we hypothesized that neighboring birds will have higher song similarity than those farther apart. Ultimately, our findings could have important implications



for the conservation of bird species and their habitats, especially in regard to habitat fragmentation and population isolation.

Poster - morning

Classroom Research Project/Assignment

**21. Impact of Spiritual Practices on Reducing Depression and Post-Traumatic Symptoms in Parents Whose Infant/Child Died in the Neonatal/Pediatric Intensive Care Unit**

By: Julia Smith and Dawn Hawthorne

Faculty Mentor(s): Dawn Hawthorne

Presenter(s): **Julia Smith**

Bereaved parents have an increased risk of depression and PTSD after experiencing infant/child death. Spirituality has been identified as an effective way to minimize depression and PTSD. The purpose of this study was to examine if using spiritual practices reduces depression and PTSD symptoms in parents whose infant/child died in the NICU/PICU. A method of triangulation was used to compare spiritual practices identified in the qualitative interviews of 31 mothers and six fathers with their depression and PTSD scores six months post-death. The findings revealed that parents use similar spiritual coping practices to cope with the death of their child including praying, trusting God, questioning God, and serving others. The results showed that bereaved mothers using spiritual practices had lower depression and PTSD scores, however, there was no significant difference for fathers. This suggests that spiritual practices may be helpful in reducing depression and PTSD in bereaved mothers.

Poster - afternoon

Health & Medical Sciences

**22. Investigating the Influence of Case Management and Housing Stability on ART Medication Adherence for Black/African American Women**

By: Megan Thurlow

Faculty Mentor(s): Safiya George and Debarshi Datta

Presenter(s): **Megan Thurlow**

Black/African American women are at higher risk of testing positive for HIV of all women diagnosed. Studies show gaps in health care interventions and barriers to HIV care with this group of women. This study aims to determine the significance of support through case management and participants' housing instability on Antiretroviral therapy (ART) adherence for Black/African American Women with HIV. A quantitative secondary data analysis was conducted from a previous cross-sectional study to investigate HIV health impacts. Participants were interviewed to understand their housing stability, use of case management, and ART adherence. This analysis consisted of 50 Black/African American women from West Alabama. Results reflected participants' housing stability and receiving case

management were trending towards significance when compared to participants' ART adherence. In future studies, the next steps are working with Black/African American women with HIV to discover ways to strengthen supportive resources and enhance healthcare provider engagement.

Poster - morning

Basic Sciences

### **23. Serotonin Effects on MSR Deficient Flies and their Implication Towards Aging**

By: David Binninger, Luz Donna Rodriguez, Vitor Pinheiro Baruffi, and Victoria Robertson

Faculty Mentor(s): David Binninger

Presenter(s): **Luz Rodriguez**, Vitor Baruffi, and Victoria Robertson

In *Drosophila*, the effects of Methionine Sulfoxide Reductase (MSR) demonstrated impacts on the physiology of flies, but a definitive cause for the phenotype was unidentifiable. In contrast to the wild type, the AB46 double null mutant, has a shorter lifetime. To quantify the effects of serotonin on MSR activity, the genotype must be known. For this purpose, we employ the TRIzol procedure, which can isolate RNA, DNA, and proteins. For our purposes, we will separate DNA only and run a PCR analysis to confirm the genotype. We have anticipated that serotonin will have a significant impact on MSR activity, particularly during the third instar developmental stage. In addition, we hypothesize that serotonin is already high in flies which would partially explain the decreased lifetime from the larvae's gut analysis. However, this is not certain as final data has not yet been acquired on our ongoing research.

Poster - afternoon

Behavioral, Educational & Social Sciences

### **24. The role of Action Identification in Reactions to Romantic Partner Transgressions**

By: Laura Gust, Morgan Cope, and Michael Maniaci

Faculty Mentor(s): Michael Maniaci

Presenter(s): **Laura Gust**

According to Action Identification Theory, individuals tend to think about their actions in terms of low-level concrete detail or high-level abstract thought. Action Identification has been previously examined within the context of romantic relationships, specifically with acceptance of false feedback on the qualities of an individual's relationship (Cope, 2021). However, Action Identification has not been examined within relational transgressions, and individuals' reactions to the transgression may depend on how they are thinking about the issue - specifically if they are construing scenarios at high or low levels. The current study investigates how the situational level of action identification could impact psychological reactions to transgression scenarios with a romantic partner. Specifically, we will examine how priming different levels of action identification impact responses after a hypothetical romantic relationship transgression, including rumination, distress, blame, and forgiveness.

Poster - morning

Classroom Research Project/Assignment

### **25. Measuring Ad Length, Viewership, & Target Audience**

By: Takbir Sibia, Francisco Juarez, Juan Florez, Alexander Horan, and Jake Busekrus

Faculty Mentor(s): Amy Tift

Presenter(s): **Takbir Sibia** and Francisco Juarez

With the vast number of television viewers, television advertisements remain a critical and complex subject for broadcasting stations. While the advertisements constitute a main component of channel revenue, they may also irritate viewers if the advertisements are too long. Previous research has shown the most irritating factor for viewers is advertisement length rather than content or other factors (Raditya et al., 2020). In the present study, we analyzed five different channels (ABC, CBS, CNN, FOX, and NBC) to determine the relationship between television viewership, target audience, and the length of advertisements. Specifically, we recorded the advertisement length, target audience, and channel viewership in a morning interval (8 AM - 9 AM) and an afternoon interval (6 PM - 7PM). In our research, we find a clear negative correlation between viewership and advertisement length. By demonstrating a correlation between television viewership and advertisement length, any network can develop individualized approaches for advertising.

Poster - afternoon

Health & Medical Sciences

### **26. Determining the Effectiveness of Diet Coaching About Dietary Protein Intake in Females at the Age of 55+**

By: Elise Bushong and Sareen Gropper

Faculty Mentor(s): Sareen Gropper

Presenter(s): **Elise Bushong**

Many adults fail to consume the appropriate dietary protein amount which can result in a progressive loss of muscle, also known as sarcopenia. This study aimed to examine the effectiveness of nutrition education with or without diet coaching on protein intake. The pilot study included 20 female participants aged 55-82 recruited in Florida. The intervention group (n=12) received nutrition education and diet coaching. The control group (n=8) only received nutritional education about dietary protein. At baseline and eight weeks, anthropometric findings and protein intake were examined. Statistical analyses examined the differences between the groups. No significant differences in protein intake were found between the two groups at baseline. Protein intakes (g/day and g/kg body weight) were significantly greater ( $p=0.0091$  and  $p=0.0233$  respectively) among the participants in the

intervention versus control group at eight weeks. Diet coaching with nutritional education was more effective in improving protein intake versus nutrition education alone.

Poster - morning

Behavioral, Educational & Social Sciences

### **27. Capitol Insurrection Misinformation Through Tweets by Senators**

By: Asna Nayani and Kevin Wagner

Faculty Mentor(s): Kevin Wagner

Presenter(s): **Asna Nayani**

On January 6th, 2021, a violent mob attacked the US capitol in response to incitement by then President Donald Trump who claimed that his loss in the 2020 election had been fraudulent. Following this event, politicians on both isles presented their responses, partially on Twitter. The responses served to spread information and calm the public, but they may have also spread misinformation. This project analyzed all tweets related to the attack sent out by sitting senators over the two weeks following the attack to determine the amount of misinformation and how that related to party affiliation. The tweets were gathered through TweetDeck and analyzed within a true/false binary. Out of the 665 tweets collected, 8 were false, and nearly two-thirds of the Tweets were from Democrats. Neither side spread much misinformation, and Republicans spoke far less on the matter, possibly due to the Presidential affiliation with their party.

Poster - afternoon

Health & Medical Sciences

### **28. Effects of Sulforaphane on the Community Structure of the Gut Microbiome of Mice Exposed to Microcystin Toxicity**

By: Rised Philogene, Stephanie Toleno, Jean Bontemps, Krista McCoy, and Nwadiuto Esiobu

Faculty Mentor(s): Nwadiuto Esiobu

Presenter(s): **Rised Philogene** and Stephanie Toleno

Humans are constantly exposed to environmental toxins, such as the cyanotoxin microcystin (MCN). The role of the gut microbiome engineered with beneficial food supplements in building resilience to these toxins is only beginning to be understood. Our research aims to determine the effect of sulforaphane (SFN, a compound found in cruciferous vegetables) as a potential prebiotic molecule and define the gut microbiome dynamics associated with its beneficial roles. Previous research in this lab revealed that mice treated with MCN suffered a drastic decline in cultivable microbiota diversity, while mice that were treated with both MCN and SFN showed a 4-fold increase in morphotypes. In this study, remaining fecal materials from our previous study will be analyzed using 16S amplicon metagenomics to obtain a comprehensive response of non-cultivable and cultivable microbiota to SFN

treatment. This study underscores the need for integrating metagenomics with classic microbiology assays in evaluating gut microbiota function.

Poster - morning

Behavioral, Educational & Social Sciences

### **29. Language Frequency: Computer-Mediated Trials to Criteria of Spanish Syntax**

By: Ciara O'Neill

Faculty Mentor(s): Justin White

Presenter(s): **Ciara O'Neill**

Second language acquisition focuses on how language learners process, store, and access language. Previous research suggests that learners have default strategies to process syntax, which are sometimes non-optimal. Exposing learners to certain types of language input can push learners to alter these strategies and process language correctly. This research aims to investigate how much input is necessary for learners to consistently provide correct responses, indicating a change in their processing strategy. The study will focus on Spanish direct object pronouns and the First Noun Principle, which states that learners tend to process the first noun or pronoun in a sentence as the subject. It will also incorporate a custom web application to track the moment-to-moment behavior of participants as they are exposed to large amounts of input. Findings from this study will contribute to the design of language-learning activities and further the field's understanding of language acquisition's underlying processes.

Poster - afternoon

Engineering

### **30. Particle-Particle Interaction and Agglomeration Characteristics During Gravitational Settling**

By: Kostiantyn Ostapchuk, Ella Bethke, Mazen Hafez, and Myeongsub Kim

Faculty Mentor(s): Myeongsub Kim

Presenter(s): **Kostiantyn Ostapchuk** and Ella Bethke

Fracking is a leading natural gas extraction technology. Proppants entrained in fracturing fluid support the fracture and prevent premature closures. Thus, efficient proppant placement and settling impact reservoir permeability. Minimal attention has been given to understanding the complex proppant agglomeration mechanisms, a main cause of permeability impairment. While two-dimensional studies indicate a direct correlation between fluid viscosity and agglomeration, agglomerate-forming mechanisms in a settling slurry are still ambiguous. The present study utilizes a combination of high-speed imaging and particle image velocimetry to investigate fundamental proppant agglomeration. Multiple mesh-size proppants are released in a cell filled with viscous fluid. To further explore

agglomeration nature, this study identified an optimal proppant mesh size mixing ratio and fluid viscosity to facilitate hindered settling and lower slurry average settling velocity. The results show the close relationship between unique agglomeration patterns and the existence of an optimal viscosity for reduced settling velocity and minimal agglomeration.

Poster - morning

Classroom Research Project/Assignment

### **31. Who's Got the Power? Roles of Drug Court Officials**

By: Amanda Brown and Lincoln Sloas

Faculty Mentor(s): Lincoln Sloas

Presenter(s): **Amanda Brown**

Drug courts open the possibility for people with drug-related issues to take the route of rehabilitation as opposed to punitive approaches like incarceration. Studying drug courts helps the community and the offenders. It broadens the knowledge of those involved to better assist offenders with such crimes. This poster presentation reveals a qualitative study including court observations and interviews while focusing on the role, power, and ethical standards of drug court officials. I present my findings as it relates to age, language, and rewards/sanctions imposed by members of the drug court team along with educating people on the drug court process. These findings help to contribute to our understanding of the research question on the role, power, and ethical standards of drug court officials.

Poster - afternoon

Behavioral, Educational & Social Sciences

### **32. Recent Archaeological Analyses at Jupiter Inlet, Florida**

By: Christopher Rubido, Matthew Kurtz, and Victoria Piotrowski

Faculty Mentor(s): Katharine Napora

Presenter(s): **Christopher Rubido**, Matthew Kurtz, and Victoria Piotrowski

The Jupiter Inlet Lighthouse Outstanding Natural Area in northern Palm Beach County, Florida is an important multi-period coastal archaeological site with a history of human occupation spanning six millennia. Construction activity and erosion, however, threaten the continued stability of the site and its cultural resources that still lay beneath the surface. Here, we discuss the methodologies employed and the findings from the Spring 2023 Florida Public Archaeology Network (FPAN) Archaeological Field School. Our results so far have illuminated some of the erosional processes impacting Jupiter Inlet and revealed new facets of the 19th century and WWII-era components of the site.

Poster - morning

Health & Medical Sciences

### **33. Determining the Impact of Education Level in HeartMath Training on Anxiety & Coherence in Parents or Guardians of Preschoolers in Head Start**

By: Donielle Lowe

Faculty Mentor(s): Beth King

Presenter(s): **Donielle Lowe**

Individuals with lower socioeconomic status (SES) face negative outcomes associated with their SES, including less resources, poorer health outcomes, and psychological distress, demonstrating need for a self-regulation program, HeartMath. The purpose of this secondary data analysis was to examine the relationship between educational level of parents or guardians of preschoolers in a Head Start program and the impact of HeartMath training aimed to lower anxiety and increase coherence level of participants. Data from 26 participants who completed a six-week program of HeartMath self-regulation training, included educational level, and pre and post measurements of PROMIS anxiety short form tool, and heart rate variability measurement. The results indicated there were no significant differences of post-intervention anxiety and coherence scores by education levels. The findings of this study indicate educational level is not an influencing factor the evidence-based practice of HeartMath and decreasing anxiety and increasing coherence level.

Poster - afternoon

Health & Medical Sciences

### **34. The Antipsychotic Sulpiride Rescues only select Behavioral Phenotypes in DAT Val559 mice**

By: Steven Shatkhin, Adele Stewart, and Randy Blakely

Faculty Mentor(s): Randy Blakely and Adele Stewart

Presenter(s): **Steven Shatkhin**

Dopaminergic dysfunction has been implicated in multiple neuropsychiatric disorders. The dopamine transporter (DAT) is responsible for the reuptake of synaptic dopamine, and mutations in DAT have been identified in subjects with autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD). One such mutation, the DAT Val559 substitution, drives aberrant dopamine efflux and leads to sex-biased alterations in dopamine homeostasis and behavior in DAT Val559 mice. Among the behavioral phenotypes observed are an increase in wins in the tube test, a test of social dominance, and a reduction in sociability in DAT Val559 male mice as well as aversion to light exploration in DAT Val559 females. While prior work in the lab showed that targeting dopamine D2 receptors with the antipsychotic sulpiride reversed cognitive deficits in DAT Val559 mice, I have shown that sulpiride fails to impact social behaviors in DAT Val559 males and exacerbates anxiety in DAT Val559 females.

Poster - morning

Engineering

### **35. Surface Vessel for Water Sampling with Modular Water Sampling Payload**

By: Twain Glas, Louis DeVito, Alain Andre, Connor Hartmann, Nichole Vernon, Nicolas Davila Gomez, and Pierre-Philippe Beaujean

Faculty Mentor(s): Pierre-Philippe Beaujean

Presenter(s): **Twain Glas**, Louis DeVito, Alain Andre, Connor Hartmann, Nichole Vernon, and Nicolas Davila Gomez

In today's society, water sampling comes to the forefront as one of the key methods of investigation regarding water pollution and cleanliness. In order to test the micro plastic concentration in water, our team will be conducting a senior design project in which we will design an Autonomous Surface Vessel (ASV) capable of operating both independently and remotely in order to gather samples at specific depths, between surface level and 5 meter depths. This will allow for efficient and accurate data collection which can then be retrieved and tested in a laboratory environment to determine the exact concentration of microplastics at a given location and depth. In addition, part of the assigned mission involves long distance travel of the vessel (approximately 5 miles) in a race format, so it will be necessary to take into consideration energy efficiency as well as battery charge duration and speed.

Poster - afternoon

Engineering

### **36. Human Powered Exploration Rover**

By: Martin Thom, Henrique Almeida, Seth Baniqued, Antonio Cheraso, Gustavo Campuzano, Rishav Goolcharan, and Alexander Stewart

Faculty Mentor(s): Oscar Curet

Presenter(s): **Antonio Cheraso**, Martin Thom, Henrique Almeida, Seth Baniqued, Gustavo Campuzano, Rishav Goolcharan, and Alexander Stewart

In recent years, there has been a renewed interest in human space exploration. Due to this, a need for transportation on surfaces of planets and moons has become clear. Existing forms of transportation, requiring batteries, are heavy and take up space. A possible solution to these drawbacks is human power. This project dealt with designing and fabricating a human powered rover designed to carry two pilots which could traverse different landscapes. The rover is designed to be lightweight, robust, occupy a small amount of space, and able to collect liquid samples via a multi tool. It is designed to compete in the 2023 NASA Human Exploration Rover Challenge.

Poster - morning



Basic Sciences

### **37. Identification of Food Nutrients Controlling C. Elegans Larval Development**

By: Robert Van De Werken, Aleyna Chung, Sara Frazer, and Kailiang Jia

Faculty Mentor(s): Kailiang Jia

Presenter(s): **Robert Van De Werken**, Aleyna Chung, and Sara Frazer

Food nutrients are essential for the development of *Caenorhabditis elegans*. Under starvation, *C. elegans* enter an arrested developmental stage called dauer. Two signaling transduction pathways, DAF-2/IGF and DAF-7/TGF-B, respond to food nutrient levels. However, the specific nutrients that control dauer formation are undiscovered. *C. elegans* feed on *E. coli*. We hypothesize that mutations of *E. coli* genes that are involved in production of food nutrient signals should enhance dauer formation of *daf-2* and *daf-7* mutants. In this study, we examined the effect of eight deletion mutants of *E. coli* strain K12 on dauer formation, and found that the data support our hypothesis. *C. elegans* dauer is equivalent to the infective larvae of nematode parasites. Identification of the specific nutrients that determine dauer formation of *C. elegans* may allow for the design of drugs that disrupt the life cycle of nematode parasites and prevent parasitic infection in agricultural industries.

Poster - afternoon

Engineering

### **38. Position Prediction in a Simplified 2D Setting Using an Error State Kalman Filter**

By: Edgar An and Zade Micallef

Faculty Mentor(s): Edgar An

Presenter(s): **Zade Micallef**

For autonomous navigation underwater, ensuring that sensor error is either limited or adjusted for is crucial for mission success. In this project, the efficacy of a commonly used method to adjust for sensor error, Kalman filtering, was tested in a simplified two-dimensional navigation scenario. The efficacy of the Kalman filter was compared to dead reckoning in terms of error between the actual and predicted positions for a simulated autonomous underwater vehicle (AUV) over time. The data revealed that the extended Kalman filter is able to adjust for sensor error resulting in less error overall between the predicted and true AUV position when compared to dead reckoning, subject to sensor error. This study develops the basis for more complex and realistic navigation tests in the future with Kalman filtering to evaluate the efficacy of this filter in more complicated situations.

Poster - morning

Classroom Research Project/Assignment

### **39. Heterotopic Ossification of the Hip as a Result of Auto Accident: A Case Report**

By: Nicholas De Jesus, Christopher Sancillo, Mike Mastroianni, and Frank McCormick  
Faculty Mentor(s): Evonne Rezler and Frank McCormick  
Presenter(s): **Nicholas De Jesus**

A middle aged Male presented for a heterotopic ossification of the right hip. A heterotopic ossification is bone formation that can occur in soft tissues, especially sub musculature in the iliac region of the body. Symptoms associated with a heterotopic ossification: a lower extremity joint are pain, joint effusion, change in gait, and limited range-of-motion of the affected joint. A heterotopic ossification of the hip can be the result of trauma, joint arthroplasty, burns, and major orthopedic surgeries. In this case report, we have an otherwise healthy male who was indicated for a heterotopic ossification on the anterior proximal femur. This patient was involved in an auto collision in 2021. After the patient proceeded with the surgical procedure. An appointment was conducted after surgery the patient reported a 0 out of 10 pain score and was satisfied with the procedure proving the clinical impact of surgical excision targeting heterotopic ossification.

Poster - afternoon

Health & Medical Sciences

#### **40. Sequential Therapy for Endometriosis by Targeting Notch and Progesterone Receptors**

By: Holland Larsen, Gladel Saintilme, and Muhammad Ramay  
Faculty Mentor(s): James Hartmann  
Presenter(s): **Muhammad Ramay** and Gladel Saintilme

Endometriosis is an extremely prevalent estrogen-driven disease, affecting large portions of the female population. In endometriosis, a portion of the lining in the uterus, the endometrium, thrives outside the uterine cavity. It causes a variety of symptoms ranging from pain and discomfort to even infertility in some cases. The lesions formed by the disease are chiefly driven by a signaling pathway known as the Notch signaling pathway. Estrogen upregulates this pathway, driving the progress of the disease, and causing abnormal cell growth. However, the disease is inhibited by progesterone. Our aim is to down-regulate the Notch signaling pathway with inhibitors like curcumin and valproic acid. This would help make the cells more accepting of progestins, a type of progesterone, like dienogest. Through this Notch signaling pathway inhibition and increased progesterone receptivity, we aim to inhibit the estrogen-dependent lesions in the disease.

Poster - morning

Cross Disciplinary Projects

#### **41. The Role and Representation of Latin American Women in US Society**

By: Elizabeth Insuasti  
Faculty Mentor(s): Camila Llach

Presenter(s): **Elizabeth Insuasti**

Visibility, or lack thereof, in our public spheres and even our media has vital effects on Latino lives and the opportunities the Latino community is afforded. This is particularly true for Latin American women. The history of Latin American women's participation in the culture and political life of both Latin American countries and the US has often been overlooked. By emphasizing the past efforts of feminist Latina movements and activism, such as the Chicana movement, future social justice efforts can evolve. Furthermore, categorizing and analyzing the present-day role of women in Latin American societies and families can unveil the deeply ingrained patterns of gender inequity and patriarchal values within them. This can further be reflected in the representation of Latina women in films, literature, and leadership positions. In addition to exploring the harmful stereotypes against Latina women, this project also aims to highlight the strides made to fight Latina discrimination.

Poster - afternoon

Behavioral, Educational & Social Sciences

**42. How Conformity with Traditional Masculine Norms and Precarious Manhood Predict Support for Political Policies Limiting the Participation of Women in the Public Sphere, and Their Rights in the Domestic Sphere**

By: Jada Bowers, Molly McGonnell, Jordan Thompson, and Geoffrey Wetherell

Faculty Mentor(s): Geoffrey Wetherell

Presenter(s): **Jada Bowers** and Molly McGonnell

There are many U.S. policies that grant men power over women, and specific individual differences among men may predict support for such policies. Precarious manhood is the belief that manhood can be won and lost, and adherence to traditional masculine norms is an endorsement of male toughness and tradition. We predict that men high in precarious manhood and traditional masculine norms will be especially likely to endorse gendered hierarchies in the domestic and public spheres respectively when they think masculinity is under threat. We expect the effects of traditional masculinity to be explained by status threat and the effects of precarious manhood to be explained by gender role disparity threat. The data consist of 700 men who completed measures of support for gender hierarchy in the public and domestic sphere, support for traditional masculinity, precarious manhood, threat to masculine norms, status threat, and gender role disparity stress. Implications are discussed.

Poster - morning

Engineering

**43. Development of a Cerebrospinal Fluid (CSF) Shunt Device for the Treatment of Hydrocephalus in Point-of-Care (POC) Settings**

By: Maryam Imran, Muhammad Waleed Anjum, and Waseem Asghar

Faculty Mentor(s): Waseem Asghar

Presenter(s): **Maryam Imran**

Cerebrospinal fluid (CSF) is fluid in the brain ventricles responsible for maintaining the overall homeostasis of the brain. A buildup of CSF can result in the neurological condition of hydrocephalus. Shunt devices are used to treat hydrocephalus yet are costly and unavailable in point-of-care settings (POC). This project aimed to develop a functioning shunt device for POC settings by testing numerous designs and materials to prevent shunt malfunctions and create a cost-effective, and thus more widely-available option. Shunt designs were created using CAD and 3D printing and tested in a model setup of brain ventricles. A circular prototype has been developed with an electrically controlled, ball-in-cone feature. A flow sensor, connected to the prototype, provides flow rate. Preliminary data show that the prototype is able to yield experimental CSF flow rates that approach that of a healthy individual. More testing will help to further optimize it for eventual clinical application.

Poster - afternoon

Behavioral, Educational & Social Sciences

#### **44. The Formation of False Memories and Actor Changes**

By: Roselyn Diaz, Alan Kersten, and Julie Earles

Faculty Mentor(s): Julie Earles and Alan Kersten

Presenter(s): **Roselyn Diaz**

False memories form when individuals either alter specific details of an event or begin to believe that an entirely different event occurred. The main goal of this project was to determine how changes in actor gender, age, and/or both affect the establishment of false memories. The first session is characterized as encoding and the second is known as retrieval. For both sessions, each performed a week apart, participants viewed various events involving actors performing different actions. Computerized testing was performed after both sessions. Based on previous studies, we expected the likelihood of false recollection to increase among participants when the gender and age of the actor remained the same. This study is one of the few that has studied event memory in relation to changes in actor gender and/or age, which allows for new information regarding the effects of actor gender and age on memory to be known.

Poster - morning

Classroom Research Project/Assignment

#### **45. Value-Based Care in Arthroscopic Rotator Cuff Repair: A Lean Six Sigma Approach for Optimizing the Surgical Recovery Period**

By: Christopher Sancilio, Michael A. Mastroianni, Jeffrey Shi, Alegra Mendez, Marshal Armitage, and Frank McCormick

Faculty Mentor(s): Carl Hansen and Frank McCormick

Presenter(s): **Chris Sancilio**

There is a need to optimize the surgical recovery period after rotator cuff repair, and there is no lean six sigma protocol on how to effectively manage follow-up without increasing burden on patients or providers. The Kanban board outcome assessment tool was managed by athletic trainers and was used to organize the recovery period. Statistical analysis was done by two-tailed, two-sample t-test, and multiple linear regression. Fifty-seven patients with a survey compliance rate of 82.4% were compared to 4633 patients in a global registry with 58% compliance at 2 years. Pretreatment baseline scores were also significantly worse in our LSS cohort. Despite this, our analysis identified a statistically significant improvement in Visual Analog scales. Our LSS approach yielded clinically significant 38% less pain and 20% improved shoulder function compared to a global registry. Quality of life measures also improved by nearly 20% for both physical and mental health.

Poster - afternoon

Behavioral, Educational & Social Sciences

#### **46. Assessment of Psychosocial Indicators Linked to Canine Intervention Treatment Response in Veterans with Post-traumatic Stress Symptoms**

By: Abigail Kremer and Alyssa Cusumano

Faculty Mentor(s): Cheryl Krause-Parello and Beth Pratt

Presenter(s): **Abigail Kremer** and Alyssa Cusumano

Post-traumatic stress disorder significantly affects up to 30% of United States Veterans in spite of numerous pharmacologic and cognitive/behavioral therapeutic treatments. Non-pharmacological adjunctive therapies, such as animal-assisted interventions (AAI), have demonstrated improvement in veterans' physiologic and psychosocial health. This study aimed to measure the effects of engaging veterans suffering from post-traumatic stress (PTS) symptoms in an eight-week, hands-on shelter dog adoption and training program. This exploratory pilot study used a 2-arm randomized controlled trial (RCT) design with two-time points (T): T1=pre-intervention/control and T2=post-intervention/control. Participants (N=9) self-reported PTS and loneliness symptoms. Preliminary results from reliable and valid measures indicate that Veterans in the intervention group had a 15.6-point decrease from T1 to T2 in PTS symptom severity scores and a 0.2-point decrease in loneliness scores. These outcomes support further investigation on the efficacy of dog adoption and training programs as a treatment option for Veterans suffering with PTS symptoms.

Poster - morning

Environmental, Ecological & Marine Sciences

**47. Internal Anatomy of Fishes Using Diaphonization**

By: Joseph Alexander, Madeleine Hagood, and Marianne Porter

Faculty Mentor(s): Marianne Porter

Presenter(s): **Joseph Alexander**

Scientific outreach is a vital part of engaging and communicating research to the community. Diaphonization, the process of clearing and staining, is utilized to visualize internal anatomy. This technique is used in animals with tissues and structures too small or delicate to be dissected traditionally. In this process, we fix specimens in buffered formalin, incompletely macerate them, and clear the muscular tissue. Finally, we stain the cartilage with Alcian Blue and bony structures with Alizarin Red, and store specimens in glycerin. The results allow morphological variation such as skeletal composition, to be easily visualized, and this process can be used to identify anatomical anomalies. We have diaphonized representatives from five species (2 bony fish; 3 cartilaginous fishes). Due to the inherently visual nature of this work, diaphonization could be used in community education and outreach.

Poster - afternoon

Basic Sciences

**48. The Temperature-Sensitive Role of the TRPA1 Ion Channel on Longevity in *Drosophila Melanogaster***

By: Mariam Rizvi and William Ja

Faculty Mentor(s): Monica Maldonado and William Ja

Presenter(s): **Mariam Rizvi**

Temperature is one aspect of the environment that influences the aging process. Prior studies have established that cold temperatures can extend lifespan in many organisms, including nematodes, vertebrates, and flies. Recent findings show that lifespan extension is not simply a result of general thermodynamic changes but instead, changes in temperature regulate specific cellular pathways that alter physiology and metabolism. Transient receptor potential (TRP) channels play diverse roles in sensory systems, including thermosensation, and are evolutionarily conserved in *Drosophila melanogaster*, *C. elegans*, and mammals. While the TRPA1 channel has been found to regulate *C. elegans* lifespan in response to temperature, it is unknown whether TRP channels contribute to cold-mediated longevity in other organisms. The proposed study investigates whether the TRPA1 ion channel in *Drosophila melanogaster* contributes to temperature-sensitive longevity. Expanding knowledge on the factors regulating lifespan contributes to a better understanding of the underpinnings of aging and disease in mammals.

Poster - morning

Health & Medical Sciences

**49. Utilizing the Coming Out Experiences of Gender Minorities to Alleviate Health Disparities**

By: Nicole Neginsky and Narciso Quidley-Rodriguez

Faculty Mentor(s): Narciso Quidley-Rodriguez

Presenter(s): **Nicole Neginsky**

Gender minorities (GM) experience health disparities such as depression and suicide at higher rates than cisgender persons in part related to stressors surrounding disclosing gender identity. The purpose of this study is to explore the coming experience of gender minorities to learn ways to mitigate the stressors related to “coming out” and improve mental health. This study utilized a grounded theory approach with a sample of 5 participants. Participants were recruited through flyers and snowball sampling and interviewed through Webex. From data analysis, three major themes came to light: “Feeling of Otherness,” “Coming Out,” and “Wanting Acceptance.” with six sub-themes: Growing Up, Sexual Orientation vs. Gender Identity, Exploring Identity, Discovering the Community, Education, and Healthcare. The data shows that using correct pronouns and seeing identity creates an environment that encourages GM to return to their PCP. These findings can be applied to healthcare settings to improve care delivered to GM.

Poster - afternoon

Behavioral, Educational & Social Sciences

**50. Developing Applied Anthropological Outreach with the Smithsonian Learning Lab**

By: Micaela Candia

Faculty Mentor(s): Katharine Napora

Presenter(s): **Micaela Candia**

The Caribbean Indigenous Resistance ¡Taíno Live On! is a traveling exhibit created through collaborative work with the Smithsonian Institution Traveling Exhibition Service (SITES) and the National Museums of the American Indian and American Latino. Visitors will be educated on Caribbean Indigenous culture and survival during pre and post-contact periods. A vital component of this SITES is their learning lab, where educators can freely access learning materials that reflect the exhibition's contents. For this exhibit, I am creating activities for K-12th graders that reflect the Caribbean Indigenous Resistance ¡Taíno Live On! I aim to effectively translate unbiased and inclusive knowledge for children of all ages through an anthropological lens.

Poster - morning

Health & Medical Sciences

### **51. A Study to Elucidate Matrix Metalloproteinase 14 Expression in Pancreatic Cancer Cell Lines Under Both Normoxic and Hypoxic Conditions**

By: Kathryn Martin, Nihasika Gopi, Jessica Frank, Lillian Onwuha-Ekpete, and Gregg B. Fields

Faculty Mentor(s): Gregg B. Fields and Lillian Onwuha-Ekpete

Presenter(s): **Kathryn Martin**

Various key players have been implicated in the development of pancreatic cancer, among these is a member of the matrix metalloproteinase (MMP) family of proteolytic enzymes, MMP-14. This enzyme's proteolytic activities have been implicated in cancer proliferation, invasion, and metastasis; however, little is known about its non-proteolytic and/or intracellular roles. Furthermore, research to date has focused on in vitro cell culture conditions under normoxic conditions, yet cancer exists physiologically under hypoxic conditions. Under physiological hypoxic conditions members of the MMP family have been associated with altered cellular behavior. Thus, there is a need to elucidate MMP-14's roles under both normoxic and hypoxic conditions. This study seeks to: (1) characterize the expression of MMP-14 in representative pancreatic cancer cell lines in relation to other cancer associated MMPs; (2) elucidate the impact of hypoxic conditions on MMP-14 expression and/or functionality; (3) monitor the differences at both the gene and protein expression levels

Poster - afternoon

Engineering

### **52. The Use of Machine Learning Algorithms to Contribute in Social Good**

By: Danny Alice

Faculty Mentor(s): Dimitris Pados

Presenter(s): **Danny Alice**

Artificial intelligence and machine learning can be utilized in conjunction to solve problems in society. In today's world, the need for AI and ML can create a positive outcome for situations such as predicting wildfires and floods for people in your community, tracking endangered species, and detecting plant disease for farmers and creating solutions for future use if needed. AI and ML can assist with future problems such as poverty, climate change, crime, education, healthcare and much more. The call for AI and ML to take part in these challenges has risen and continues to be as time moves forward and issues in our society appear.

Poster - morning

Health & Medical Sciences

### **53. The Impact of Socialization on People with Alzheimer's Disease**



By: Lillian Wakeman and Christine Williams

Faculty Mentor(s): Christine Williams

Presenter(s): **Lillian Wakeman**

As the average lifespan continues to increase, so does the risk of Alzheimer's Disease. The treatment options for Alzheimer's Disease remain limited, but socialization has proven to slow progression. The purpose of this study is to observe videos of the therapeutic discussion between moderators and participants diagnosed with Alzheimer's and dementia at varied levels of progression and the effect on social engagement. An observational qualitative study was conducted using 9 participants from the Louis and Anne Green Memory and Wellness Center via pre-recorded Webex meetings. Results revealed that there were nonverbal and verbal communication techniques that resulted in either further interaction or no further interaction by either moderator or participants. The findings suggest there are therapeutic communication techniques that promote interaction, but further research is required using a larger sample. The moderated group approaches with therapeutic communication techniques can improve the quality of care for people with cognitive decline.

Poster - afternoon

Business, Marketing, Finance & Public Administration

#### **54. Reliability of ESG Designation in ESG Private Equity Funds**

By: Daniel Hric and Sofia Johan

Faculty Mentor(s): Sofia Johan

Presenter(s): **Daniel Hric**

Our research is focusing on analyzing Private Equity funds that have been designated as ESG. ESG is a rating that companies are able to acquire if they are making a positive impact in the Environmental, Social, or Governance fields. Private Equity funds that have acquired the ESG designation claim to invest solely in ESG companies. Portfolio companies of PE funds are not required to file public filings, so investors are unable to reliably check the activity of the portfolio companies that the ESG funds have invested in. As a result, research is needed to evaluate if the PE funds that claim to be ESG, do in fact invest in ESG companies.

Poster - morning

Behavioral, Educational & Social Sciences

#### **55. Mind-Body Intervention as Pain Management for Military Veterans with Chronic Low Back Pain**

By: Roshan Rejit, Juyoung Park, Cheryl Krause- Parello, David Newman, Felicia Jereda, and Michele Williams

Faculty Mentor(s): Juyoung Park

Presenter(s): **Roshan Rejit**

The pilot study assessed the feasibility of a group-based Qigong intervention (mind-body intervention) for military veterans with chronic low back pain (CLBP) in terms of retention, safety, treatment fidelity, and collection of biological and psychosocial data. We also examined the effects of Qigong on pain intensity, pain interference, back pain-related disability, physical function, and psychosocial outcomes (sleep disturbance, post-traumatic stress disorder [PTSD], anxiety, depression, affect, and social activity). A total of 31 participants were randomly assigned to either Qigong group or wait-list control group and attended twice weekly 45-minute sessions for 8 weeks (16 sessions). The results indicated that Qigong intervention is a feasible approach for managing chronic pain and psychosocial symptoms, based on retention (83%) for the Qigong group, with no injury or other adverse events. The study results can inform future research and practice in the implementation of Qigong for promoting chronic pain therapy in Veterans with CLBP.

Poster - afternoon

Environmental, Ecological & Marine Sciences

### **56. Surveying Antibiotic Resistance in Florida Sea Turtles**

By: Sarah Milton, Christina Cortes, Nada Maher, Isabella Donadio Pizzolato, and Selah Brammer

Faculty Mentor(s): Sarah Milton

Presenter(s): **Nada Maher**, Isabella Donadio Pizzolato, and Selah Brammer

Antibiotic resistance is a growing concern due to the improper use of antibiotics and has an effect on marine wildlife, including both turtles in rehabilitation facilities and wild populations. This project examined the prevalence of antibiotic-resistant bacteria in the gut microbiome of green and loggerhead sea turtles. Using cloacal swabs, wild-caught turtles were sampled from the St. Lucie Nuclear Power Plant and rehabilitation turtles were sampled from Gumbo Limbo Nature Center. These swabs will be plated and incubated using MacConkey agar to select gram-negative bacteria. Then, the samples will be transferred into Mueller Hinton agar plates to test resistance against six frequently administered antibiotics in rehabilitation settings. Using the Kirby Bauer disc diffusion test, we found 74% of the samples resistant or intermediately resistant to two or more antibiotics and that 40% of our samples showed resistance or intermediate resistance to three or more of the antibiotics tested.

Poster - morning

Health & Medical Sciences

### **57. The Synthesis of Oxazolidinone Protected Sialic Acid Donor Analogs**

By: Evelyn Yancey, Andrew Whyte Jr, Ivet Boneva, and Mare Cudic

Faculty Mentor(s): Mare Cudic

Presenter(s): **Evelyn Yancey**

The presence of truncated glycan structures, commonly known as tumor-associated carbohydrate antigens (TACAs) play a key role in tumor initiation, progression, and metastasis. The sialyl-Tn antigen (sTn), a TACA that is overexpressed in a variety of carcinomas, is comprised of a truncated O-glycan containing a sialic acid  $\alpha$ -2,6 linked to GalNAc  $\alpha$ -O-Ser/Thr. Our objective in this project was to synthesize a protected sialic acid donor analog using an oxazolidinone protecting group, which would allow for improved reaction yields and anomeric selectivity during the synthesis of the sTn-derived glycosyl amino acids. With this objective in mind, we first deprotected acetyl groups from the phenyl-2-thioglycoside of N-acetylneuraminic acid, followed by the formation of the 5-N,4-O-oxazolidinone. The third step involved an acetylation reaction that resulted in the final product, N-acetyl-5-N,4-O-carbonyl protected thiosialoside donor. The product was further characterized by <sup>1</sup>H NMR and <sup>13</sup>C NMR.

Poster - afternoon

Health & Medical Sciences

### **58. Long-term Neurobiological Consequences of Amphetamine use During Adolescence in Mice**

By: Mia Vila, Surya Pandey, and Courtney Miller

Faculty Mentor(s): Tricia Meredith and Courtney Miller

Presenter(s): **Mia Vila**

Amphetamine is a prescription psychostimulant used in the treatment of attention deficit hyperactivity disorder (ADHD). There is a wide prevalence of misuse of this drug, particularly among adolescents, to enhance focus and attention. Evidence indicates that the non-prescription use of amphetamine during adolescence can result in long term neurological and behavioral problems. The purpose of this project is to study these behavioral impairments and their underlying neurobiology, using a mouse model. Female and male mice treated with either 0.9% saline or 3 mg/kg amphetamine during adolescence will be examined for their social and emotional behaviors during adulthood. We expect amphetamine exposed mice to exhibit reduced social behaviors and, increased anxiety and impulsive-like behaviors. Postmortem analysis is expected to reveal concomitant decrease in spine density and dendritic arborization in select brain regions. These findings would warrant further research on preventative and therapeutic measures to manage adolescent-amphetamine abuse-related harm.

Poster - morning

Environmental, Ecological & Marine Sciences

### **59. Using an Underwater Remotely Operated Vehicle (ROV) to Monitor and Observe Corals in the Ocean Through Artificial Intelligence**

By: Patrick O'Leary, Mark Zagha, and Allan Phipps  
Faculty Mentor(s): Allan Phipps  
Presenter(s): **Patrick O'Leary** and Mark Zagha

There is an ongoing issue of a loss of healthy coral reef habitats due to changes in climate, water chemistry, and coastal development at unsustainable levels. Monitoring corals for early signs of deterioration will allow for early intervention and support, which corals need to continue staying alive and healthy. Monitoring coral reefs is vital to marine ecosystems because corals serve as a home and shelter to millions of underwater species. Coral survivorship can be improved with proper monitoring and observation, which can be advanced by the use of marine robotics and artificial intelligence (AI). This project involves using an underwater remotely operated vehicle (ROV) paired with AI to monitor coral reefs and detect the health status of coral reefs. Distinguishing healthy and unhealthy corals will allow individuals to determine specific intervention plans for coral preservation efforts.

Poster - afternoon

Environmental, Ecological & Marine Sciences

### **60. Analysis of Shark Denticles' Tensile Properties in Relation to Gender and Environment**

By: Marianne Porter, Madeleine Hagood, Jamie Knaub, and Kyle Sagon

Faculty Mentor(s): Marianne Porter and Madeleine Hagood

Presenter(s): **Kyle Sagon**

Sharks are fascinating creatures that captivate the ability of evolution. Shark denticles are stiff, tough, and scale-like. Research into the evolutionary benefits of shark denticles is ongoing, and the current study seeks to establish a greater connection between a shark's tensile properties and their gender as well as environmental protection against objects such as coral. The Scanning Electron Microscope denticle analysis helps to establish an idea of how skin morphology variation may help sharks as protection within their environment or against other sharks. We hypothesize that if the shark's environment consists of physical, abrasive obstacles like coral and rock, they will have tougher, thicker denticles. The purpose of this research is to provide a better understanding of shark skin and morphology and develop fact-based theories that may potentially provide a new view or even establish old views on these apex predators.

Poster - morning

Environmental, Ecological & Marine Sciences

### **61. Species Shakedown: A Phylogenetic Analysis of Carcharhiniform Shark Vertebral Morphology**

By: Emma Pawlik, Monique Oliveira, Sonoma Arnaldy, Jamie Knaub, and Marianne E. Porter

Faculty Mentor(s): Marianne Porter

Presenter(s): **Emma Pawlik**

Sharks are a group of cartilaginous fish (subclass Elasmobranchii) that use lateral oscillations of their mineralized vertebral column to swim. The largest order of sharks, Carcharhiniformes, occupy diverse habitats, and are known to exhibit various hunting styles. Previous research found that the vertebral morphology in carcharhiniform sharks varies across species, however, it is unknown if these changes reflect the different hunting styles and habitat preferences. Here, we examined variation in vertebral morphology in a phylogenetic context. We used computed tomography imaging to quantify the 3D internal morphology of vertebrae across 13 species from 5 genera of carcharhiniform sharks. We measured mineralized wedges (dorsal, ventral, and lateral) within vertebrae and found that dorsal and lateral wedges were similar in more closely related genera. A broader understanding of vertebral morphology in a phylogenetic context can shed light on the adaptation of mineralized cartilage in carcharhiniform sharks.

Poster - afternoon

Health & Medical Sciences

### **62. Exploration of Amyloid Beta Build-up in MSR Deficient Drosophila**

By: Itzel Cabrera, Kirsten Hobson, and David Binninger

Faculty Mentor(s): David Binninger

Presenter(s): **Itzel Cabrera** and Kirsten Hobson

Amyloid Beta ( $A\beta$ ) is a peptide that aggregates in the brain and has been associated with age-related neurodegenerative diseases, such as Alzheimer's disease. Methionine sulfoxide reductase (MSR) is an enzyme that functions to reduce oxidative damage to proteins by restoring methionine sulfoxide (oxidized methionine) to functional methionine. Previous studies in mice have shown that MSR protects against the formation of amyloid beta protein. We will use an enzyme-linked immunosorbent assay (ELISA) to measure the amount of beta-amyloid in both young adult flies and animals approaching senescence. Our working hypothesis is that the accumulation of amyloid beta protein will increase with age and will be more severe in MSR-deficient *Drosophila melanogaster* (fruit fly).

Poster - morning

Health & Medical Sciences

### **63. Local Field Potentials as a Predictor for Optimal DBS Contact for Essential Tremor and Tremor-Dominant Parkinson's Disease**

By: Shelby Sabourin, Maria Merlano Gomez, Ilknur Telkes, and Julie G. Pilitsis

Faculty Mentor(s): Julie Pilitsis

Presenter(s): **Maria Merlano Gomez**

Deep brain stimulation (DBS) leads with segmented electrodes have been shown beneficial in the subthalamic nucleus (STN) in Parkinson's disease (PD) and the ventral-intermediate nucleus of the thalamus (VIM) in essential tremor (ET). Phase-amplitude coupling (PAC) is one of the most well-studied interactions between oscillations at different frequency bands, limited research has explored the use of directional Local field potentials (LFPs) using PAC. PAC can identify sub-territories of the basal ganglia structures and guide the selection of stimulation direction to assist device programming. PAC for nonlinear interactions between the phase of beta and amplitude of high-frequency oscillations (HFOs) was investigated using a Modulation Index (MI) approach. We found that phase of the VIM-LFP might be the main modulating factor in ET while it might be the amplitude of the STN-LFP in PD. These suggest that beta-HFO PAC could be used to guide optimal contact selection when directional leads are used.

Poster - afternoon

Behavioral, Educational & Social Sciences

#### **64. Americans Knowledge of International Affairs**

By: Kyle Webb

Faculty Mentor(s): Monica Escaleras

Presenter(s): **Kyle Webb**

A global pandemic, a war in Europe, and a global climate crisis mark the beginning of this new decade, where international events are of great consequence to the everyday lives of Americans. This study seeks to understand how much attention Americans pay to international affairs. This study hypothesizes that there is an age gap in who pays the closest attention to international affairs. To test this hypothesis, a 13-question survey was created using Survey Monkey and distributed using Amazon MTurk. A total of 197 responses were collected from Americans over the age of 18 for the analysis. The results show a statistically significant difference in the correct answers to questions about current events based on age. These findings help to identify gaps in education and public information for public and private entities concerned with knowledge of foreign affairs.

Poster - morning

Health & Medical Sciences

#### **65. Exploring the Impact of an Eight-Week Online Chair Yoga Program on the Heart Rate Variability of Older Adults with Dementia**

By: Barbara DiFruscio, Maria Ortega Hernandez, and JuYoung Park

Faculty Mentor(s): Maria Ortega Hernandez and JuYoung Park

Presenter(s): **Barbara DiFruscio**

Though dementia is known for its cognitive effects, there are also physiological consequences including autonomic dysfunction. Chair yoga (CY) is a feasible activity for older adults with dementia (OAwd), and may affect heart rate variability (HRV) which quantifies autonomic control. The purpose of this one group pre-test post-test quasi-experimental study is to examine whether participation in an eight-week online CY program impacts HRV in OAwd. 11 OAwd were recruited, with four participants submitting complete HRV data. Data was collected at baseline, mid-intervention, and post-intervention using the iom2 biofeedback device. Heart rate and respiratory sinus arrhythmia were obtained in three poses at each timepoint then evaluated via repeated measures ANOVA. Ultimately there were no statistically significant findings related to HRV and the use of CY, with a notable influence being the small sample size. Additional emotional, social, and physical benefits of CY warrant further exploration into promoting this exercise for OAwd.

Poster - afternoon

Basic Sciences

### **66. Creation of a Microbial Resource Collection for the Formulation of Soil Amendment Products**

By: McKhaila McKenzie and Nwadiuto Esiobu

Faculty Mentor(s): Nwadiuto Esiobu

Presenter(s): **McKhaila McKenzie**

The increasing use of inorganic fertilizers in agriculture to meet the demand for food and plant products is unsustainable, causing nitrogen pollution in waterways and remarkably damaging the environment. Also, pathogens have impacted plant yield with Citrus production declining in recent years because of citrus greening disease. In this study, plant growth-promoting microbes will be isolated and screened from a variety of plant rhizosphere and roots to create a Microbe library to serve as eco-friendly alternatives to fertilizers. Using differential selective media, all purpose, enriched culture protocols and 16S/18S rRNA sequencing, the microbes will be identified and characterized into four categories: hormone-producing, nitrogen-fixing, phosphate solubilizing, and biocontrol agents. The isolates will be stored in Cryopreservation beads and listed on a searchable database to enable customized bioinoculant formulations for specific plants. Microbe libraries are a valuable and underutilized climate-smart tool that is sustainable and eco-friendly while boosting plant health and resilience.

Poster - morning

Classroom Research Project/Assignment

### **67. Exploring the Factors That Impact the Sexual Decision Making Process of Hispanic Gay and Bisexual Men**

By: Allyson Kifer

Faculty Mentor(s): Narciso Quidley-Rodriguez

Presenter(s): **Allyson Kifer**

HIV has impacted millions of people around the world and continues to remain a public health problem. The CDC reported that HIV infections among Hispanic/Latino men who have sex with men (HMSM) have increased over the past five years, despite having stabilized for MSM overall. Understanding the sexual decision process that HMSM undergo is important to reducing the transmission and spread of HIV in the United States. The purpose of this study is to determine factors that may influence sexual decisions made by HMSM. The researchers utilized a qualitative descriptive design with semi-structured interviews. Five participant interviews were analyzed using qualitative content analysis. Findings show that factors like aesthetics, cultural factors, and perceived risks influence the sexual decision making process. This study suggests that inclusive sex education as well as proper sexual negotiation can help HMSM decrease the spread and transmission of HIV through safer sexual practices.

Poster - afternoon

Behavioral, Educational & Social Sciences

### **68. Zooarchaeological Material Digitization and AI Recognition**

By: Victoria Piotrowski and Dustin Sherwood

Faculty Mentor(s): Katharine Napora

Presenter(s): **Victoria Piotrowski** and Dustin Sherwood

The FAU Zooarchaeology Laboratory contains skeletal elements from a broad array of specimens. This exploratory project uses 3D scanning, photogrammetry, and photographs to determine best practices for digitization of these elements for broader accessibility in a database. This project is also utilizing these photographs to train an AI on image recognition of the differences between mammals, fish, reptiles, birds, and amphibians based on the unique features on their bones. The results illuminate the challenges and outcomes of this project, as well as the importance of making this information available to a broader range of scholars with the use of modern technology.

Poster - morning

Engineering

### **69. Modular Containerized Deployment System (MCDS)**

By: Antonio Rosales, Eric Schaefer, Will Smith, Vincent Mots-Edwards, and Joaquin Amad

Faculty Mentor(s): Pierre-Philippe Beaujean

Presenter(s): **Antonio Rosales**, Joaquin Amad, Will Smith, and Eric Schaefer



Shipboard cranes, davits, and other lifting devices are commonplace in the offshore and shipping industries. They are often used to transfer daughter crafts, such as lifeboats, into and out of the water. However, for military or sensitive research applications, there exists the need to accomplish this task in an inconspicuous, clandestine manner. The goal is to design a modular, fully automated system that launches and retrieves a small craft, e.g., a rigid-hulled inflatable boat (RHIB) or autonomous underwater vehicle (AUV), from an otherwise normal-looking shipping container positioned onboard a larger vessel, such as a cargo ship. The entire system, i.e., the davit mechanism, is to be fully housed inside the container between deployment and retrieval operations. The davit mechanism for this design integrates into a frame that provides the structure of the container, while also providing modularity.

Poster - afternoon

Engineering

### **70. Fire-Fighting Reconnaissance Robot**

By: Marc Zum Tobel, Bradley Narcisse, Amanda Suppe, Angelica Gonzalez, Ricardo Packer, and William Zophres

Faculty Mentor(s): Tsung-Chow Su

Presenter(s): **Marc Zum Tobel**, Parker Engh, Amanda Suppe, Ricardo Packer, William Zophres, Bradley Narcisse, and Angelica Gonzalez

This fire fighting robot prototype will aid firefighters in extinguishing fires through a high rpm flywheel system capable of launching extinguisher balls. Through a 6x6 wheeled drivetrain the robot will be able to traverse uneven terrain. Live video and sensors will relay information back to the operator and the robot will be remotely operated from a safe distance. The robot aims to provide a cheaper alternative to current robotic firefighting solutions as well as not using water to put out fires. Although exposure to fire and heat is a real issue the robot will face in action, the project aims to represent extinguisher ball launching and terrain traversing in a prototype to prove effectiveness of operation before investing in heat shielding methods.

Poster - morning

Engineering

### **71. Failure Mechanics Comparison for Carbon Fiber Composites**

By: Polina Sabitova and Ayush Gowda

Faculty Mentor(s): Allan Phipps

Presenter(s): **Polina Sabitova** and Ayush Gowda

The AEV team at FAU aims to create a solar powered racing vehicle that is optimized in weight and performance, including an ideal car body. Our team determined that carbon fiber sandwich

composites, materials made of layered carbon fiber and foam that combine the strength of carbon fiber and the lightweight of foam, are the ideal material for our car body. Previous testing focused on three-point bending testing factory-ordered foam and aluminum honeycomb to decide on our core material. This project aims to test composites that were self-created in the Stem Lab using wet-vacuum bagging, which is a more accurate representation of the composites that will be used for the body.

Poster - afternoon

Engineering

### **72. Autonomous Surf-Zone Inspection Vehicle (A.S.I.V)**

By: Matthew Turk, Michael Govea, Santiago Zapata, Garrett Flitton, and Giampiero Granado Guadagno

Faculty Mentor(s): Pierre-Philippe Beaujean

Presenter(s): **Matthew Turk**, Michael Govea, Santiago Zapata, Garrett Flitton, and Giampiero Granado Guadagno

An A.S.I.V. is an underwater vehicle that travels along the seafloor and follows a pre-programmed route to complete various surveys and inspections. It's able to relay live video of the seafloor and vehicle diagnostics, as it's equipped with communication devices, a camera, and various sensors. The main focus of developing the A.S.I.V. is to emphasize stability, surveying ability, hydrodynamics, and environmental resistance due to the harsh operating conditions. In order to tackle these requirements, our group utilized a tracked vehicle design paired with the highly hydrodynamic design of the modern day horseshoe crab. To ensure proper communications with the base computer on shore, a hybrid system using a mast and retractable buoy was created to take advantage of the shallow water operating conditions while satisfying the depth requirements for the project. This presentation highlights the development of an A.S.I.V and the challenges our group overcame for a successful project.

Poster - morning

Health & Medical Sciences

### **73. Expression of Aldh1 in Major Excretory Glands and Secondary Lymphoid Organs**

By: Numana Luqman and Daniel Nemeth

Faculty Mentor(s): Ning Quan and Daniel Nemeth

Presenter(s): **Numana Luqman**

By crossing the Aldh111-cre/ERT2 mouse with tdTomato reporter mouse line, ROSA26:CAG-LSL-TdTomato, we were able to generate a fluorescent reporter for Aldh1-Cre/ERT2 activity. Our results indicate Cre expression is present within major excretory glands: the pancreas and salivary gland and in secondary lymphoid organs like the spleen. More specifically we found tdTomato fluorescence in acinar cells of the parotid, submandibular, and sublingual glands along with the cells within the

submandibular lymph nodes. Histological analysis reveals strong tdTomato expression within these regions. Since tdTomato is a reporter gene for ALDH-1 in its subsequently crossed lines, this implies off-target expression of the ALDH-1 promoter within this transgenic model. Furthermore, this data indicates unaccounted ALDH-1 expression in exocrine cells could influence biological and behavioral data. Especially data studying astrocytic expression within the periphery. Furthermore, our research shows ALDH111 promoter is utilized by a multitude of cell types outside of the intended astrocyte population.

Poster - afternoon

Behavioral, Educational & Social Sciences

#### **74. Ongoing Public Archaeology at Jupiter Inlet, Florida**

By: Lorenza Viruet and Micaela Candia

Faculty Mentor(s): Katharine Napora

Presenter(s): **Lorenza Viruet** and Micaela Candia

The Bureau of Land Management (BLM) and the Florida Public Archaeology Network (FPAN) run a variety of public outreach programs at the Jupiter Inlet Lighthouse Outstanding Natural Area in northern Palm Beach County, Florida. Programs aim to educate visitors via interactive, engaging activities that provide hands-on experiences with the unique history and ecology of Jupiter Inlet. As part of our FPAN-directed archaeological field school at the site, we collaboratively developed outreach activities for diverse audiences, including people of various ages and with varying levels of archaeological knowledge. Here, we discuss applied archaeological pedagogy and insights into developing engaged, public-facing opportunities in field-based educational environments.

Poster - morning

Health & Medical Sciences

#### **75. Assessing Humoral and Cellular Immune Memory Generated in Response to COVID-19 Immunization**

By: Mia Johnson, Czdari Lee, Imtisal Imran, Sara Thomas, and Mahyar Nouri-Shirazi

Faculty Mentor(s): Mahyar Nouri-Shirazi

Presenter(s): **Mia Johnson**

Effective vaccines provide long-lasting immunity by protecting the vaccinated individuals and preventing the spread of disease. During the COVID-19 pandemic, new mRNA vaccines were developed to protect vaccinated individuals and prevent viral transmission. Although this vaccine and its boosters reduce the risk of serious outcomes such as hospitalization and death, it does not fully protect vaccinated individuals against breakthrough infection. In this pilot study, we correlated vaccine effectiveness by measuring the frequency of COVID-19-specific immune memory cells in the

peripheral blood of vaccinated compared to unvaccinated and unexposed individuals. We show that blood samples from vaccinated individuals had a significant increase in antibody-secreting plasma cells, but not in IFN-g-producing effector CD4 and CD8 T cells in response to recall vaccine antigen. Our preliminary data suggests the breakthrough infection rate observed in vaccinated individuals could be due to insufficient generation of memory T cells needed to sustain long-lasting memory B cells.

Poster - afternoon

Classroom Research Project/Assignment

### **76. The Flipped Classroom Model Impacting Students with ADHD**

By: Daylenis Mendez

Faculty Mentor(s): Sharon Darling

Presenter(s): **Daylenis Mendez**

The Flipped Classroom Model (FCM) is a pedagogical approach that has emerged from re-imagining classrooms and learning spaces. As Rebecca Smith (2020) stated, the FCM is an innovative and inclusive pedagogical method for students in higher education with ADHD. It promotes self-regulation and motivation to come to class but, most importantly, gives students with disabilities and other disorders access to higher education (Rooney, 2017). With various digital platforms, it offers flexibility and relief for students who face significant challenges staying focused and attentive in a traditional lecture. This preliminary research aimed to examine the effectiveness of the FCM and analyze articles about the use, growth, and efficacy of the FCM in higher education dating back to 2012. Moreover, future research will interview higher education faculty about their implementation of this model in the present to support learning and the effectiveness of this pedagogical approach.

Poster - morning

Engineering

### **77. Dual-Tracer Laser-Induced Fluorescence Thermometry for Understanding Bubble Growth during Nucleate Boiling**

By: Abel Abraham, Cristian Pena, Mahyar Ghazivini, and Myeongsub Kim

Faculty Mentor(s): Myeongsub Kim

Presenter(s): **Abel Abraham** and Cristian Pena

Nucleate boiling associated with bubble growth has been commonly used as a remarkable thermal management strategy due to its large latent heat during phase change. This research aims to better explain heat transfer to bubble growth by accurately measuring three-dimensional, space- and time-resolved, local liquid temperature distributions surrounding a growing bubble using dual-tracer laser-induced fluorescence (LIF) thermometry technique combined with high-speed imaging to accurately measure the two-dimensional bulk fluid temperature fields within 0.3 °C at a 30µm resolution near the

growing bubble. Fluorescence and Sulforhodamine B are utilized as temperature indicators to improve the LIF measurement accuracy. Results showed a temperature gradient created from the heated surface toward the bubble top, indicating the effective heat transfer rate from the superheated liquid to the growing bubble. Further observations showed a heated liquid blob present on the top of the growing bubble, showing an isolated hot spot region.

Poster - afternoon

Basic Sciences

### **78. Evaluating the Effects of Mycorrhiza and Bacteria Bio-Inoculants on Citrus and Tomatoes in Mesocosms**

By: Sarah Anselme, Mckhaila McKenzie, Ojdre Sutherland, and Nwadiuto Esiobu

Faculty Mentor(s): Nwadiuto Esiobu

Presenter(s): **Sarah Anselme**

Microbiomes of plants play a key role in nutrient uptake, plant immunity and resilience to stress. Florida citrus production has declined by more than 50% because of Citrus Greening disease. The purpose of this research was to test the hypothesis that young seedlings of citrus (*Citrus sinensis*) and tomatoes (*Solanum lycopersicum*) inoculated with mycorrhiza and plant growth promoting microbes (PGPM) will outperform controls and NPK plants in controlled growth conditions. Using randomized complete block design set up, plants were grown for about sixty days, while measuring seed germination rate, root length, shoot length, plant biomass and vigor periodically. Surprisingly, there was no significant difference between the plant growth indices of treatments and controls. Indigenous microbiomes, soil properties and poorly defined plant factors affect the outcome of bio-inoculation. This study underscores the need for a curated library of indigenous and efficient PGPM for us in sustainable agricultures

Poster - morning

Engineering

### **79. Water Skimmer**

By: Noah Andronescu, Victor Zauder, Marvin Medina, Joshua Donjuan, Daniel Vongunten, Zaki Ramnarine, and Sheena Williams

Faculty Mentor(s): Tsung-Chow Su and Oscar Curet

Presenter(s): **Victor Zauder**, Noah Andronescu, Joshua Donjuan, Marvin Medina, Daniel Vongunten, Zaki Ramnarine, and Sheena Williams

Stretching over 156 miles along the central Atlantic coast of Florida the Indian River Lagoon is one of the most biodiverse ecosystems in the northern hemisphere, home to more than 4,300 native flora and fauna. Threatened by non centralized pollution and diminishing water quality the lagoon has been

suffering from large algae blooms that destabilize the natural ecology, endangering all life equally. Due to the decentralized nature of the pollutants, our group has worked to design a mobile water quality monitoring craft that proceeds current stationary probe systems and aid researchers in observing more regions of the lagoon. Equipped with turbidity, temperature, ultrasonic and anemometer sensors the water skimmer works to gather data over extended mission periods for creating analytical trends and applied to possible future solutions.

Poster - afternoon

Engineering

### **80. The Design and Fabrication of a Biomimetic Unmanned Underwater Vehicle**

By: Carmen Riggs, Alex Gulea, Sabrina Jackson, Sean Brady, and Iyaan Tahir Barry

Faculty Mentor(s): Pierre-Philippe Beaujean

Presenter(s): **Carmen Riggs**, Alex Gulea, Sean Brady, Iyaan Barry, and Sabrina Jackson

Underwater vehicles are critical technology for multiple applications, such as military, commercial use, or scientific research. Specifically, biomimetic technology is useful for quiet, non-intrusive research or missions as enables non-intrusive propulsion compared to currently used technology. This project focused around the design and fabrication of a biomimetic unmanned underwater vehicle that utilizes undulating fin propulsion to achieve 4 degrees of freedom (DOF). The specified project requirements are that the vehicle shall be able to achieve four DOF of motion, travel at half a body length per second, and be able to pitch  $\pm 90^\circ$ . The system was designed to satisfy all project requirements as well as prioritize simplicity, cost efficiency, and vehicle performance.

Poster - morning

Health & Medical Sciences

### **81. Menstrual Health: An International Public Health Crisis**

By: Brittany L. Berlin

Faculty Mentor(s): Tricia Meredith and Robert Sarro

Presenter(s): **Brittany Berlin**

Menstrual health is a significant public health issue affecting millions of women in underdeveloped nations. By contributing to absenteeism in school as well as furthering gender and economic inequality in rural and underdeveloped countries throughout the world, the issue of menstrual health is essential to address. A literature review was conducted to identify the causes of poor menstrual health and solutions initiated in many countries. The importance of waste management techniques, dispelling common cultural taboos, access to appropriate menstrual products, and clean water are common contributing factors. Many nations have found success with educational campaigns, offering free, high-quality period products, and initiating infrastructure products to promote effective menstrual

waste management techniques. Through a detailed understanding of the issue's complexity, a multifaceted solution can be crafted for policymakers to consider in addressing this burgeoning public health crisis.

Poster - afternoon

Engineering

### **82. NASA Human Exploration Rover Challenge - Team 1**

By: Dany Salazar Masache, Ian Potamos, Tyler Denny, Deanna Jean-Baptiste, Ruben Kurdelchuk, Alejandro Lopez and Kevin Markevitch

Faculty Mentor(s): Oscar Curet

Presenter(s): **Dany Salazar Masache**, Ian Potamos, Tyler Denny, Deanna Jean-Baptiste, Ruben Kurdelchuk, Alejandro Lopez, and Kevin Markevitch

The NASA Human Exploration Rover Challenge (HERC) is a rigorous and continuously evolving activity that engages students in hands-on engineering design related to NASA's missions. HERC aims to meet established educational objectives and provide continuous program improvement that satisfies the needs of its participants. The primary purpose of HERC is for teams of students to design, develop, build, and test human-powered rovers capable of traversing challenging terrain and a task tool for the completion of various mission tasks. The competition course requires two students, at least one female, to use the student-designed vehicle to traverse a designated route of approximately half-mile, including a simulated field of asteroid debris, boulders, erosion ruts, crevasses, and an ancient streambed.

Poster - morning

Health & Medical Sciences

### **83. Efficacy of a Tailored Exercise Program for Osteoarthritis Pain Management in Older Adults**

By: Sarah Lowe and Lenny Chiang-Hanisko

Faculty Mentor(s): Lenny Chiang-Hanisko

Presenter(s): **Sarah Lowe**

Osteoarthritis (OA), a degenerative joint disease with no cure, is the leading cause of disability that affects over 32.5 million adults in the United States. The purpose of this study was to determine if a tailored exercise program (TEP) that includes balance exercises, resistance exercises with or without free weights, and cool-down stretching can decrease OA pain in older adults aged 55 years and older. This experimental, randomized, pre and post-test study consisted of 14 older adults. The control group (CO) consisted of six participants, and the intervention group (INT) consisted of 8 participants. The results indicated that pain levels decreased for INT and CO, but INT had a greater

decrease. For pain interference, both the INT and CO group increased. Therefore, a TEP has the potential to provide a positive impact on OA pain for older adults, but additional interventions are needed to improve pain interference.

Poster - afternoon

Basic Sciences

#### **84. Comparative Mechanical Properties of Mineralized Shark Vertebrae**

By: Maria Uribe Mejia, Joshua St Juste-Ellis, Delaney Frazier, Aubrey Clark, and Marianne Porter

Faculty Mentor(s): Marianne Porter

Presenter(s): **Maria Uribe Mejia** and Joshua St Juste-Ellis

Sharks (subclass: Elasmobranchii) have vertebral columns composed of mineralized cartilage. Stiff sharks have reduced undulatory waves along the body, which produce fast swimming. Our goal was to quantify, in a comparative context, the mechanical properties of shark vertebral cartilage. We hypothesized that faster swimming species will have stiffer (ability to withstand compression) and tougher (ability to absorb energy) vertebrae compared to species with slower swimming speeds. We assessed mechanical properties among orders Carcharhiniformes, Lamniformes, and Orectolobiformes, which represent 60 species to date. Using an Instron materials testing system, we tested each vertebra in compression at biologically relevant strain rates (0.1, 1, and 10%) to determine trends in stiffness and toughness. Contrary to our hypothesis, we found that the vertebrae of the fast swimming sharks were less stiff and tough compared to slower species. Understanding vertebral column properties gives insights into the mechanical underpinnings of fast versus slow swimming.

Poster - morning

Health & Medical Sciences

#### **85. Investigating the Mechanism Behind RORa's Repression of IFN- $\gamma$**

By: Avanthi Puvvala, Jonathan Chuck, and Laura A. Solt

Faculty Mentor(s): Monica Maldonado and Laura Solt

Presenter(s): **Avanthi Puvvala**

Interferon-gamma (IFN- $\gamma$ ) is a cytokine essential in the regulation of both innate and adaptive immunity. Upon activation CD8+ T cells produce and secrete IFN- $\gamma$  as part of the adaptive immune response. Previous studies into the role of the nuclear receptor Retinoic acid-receptor related orphan receptor alpha (RORa) in the immune system found IFN- $\gamma$  production in CD8+ T cells to be enhanced in RORa deficient mice. However, the exact mechanism governing this phenotype remains elusive. We have previously found that overexpression of RORa in CD8+ T cells represses IFN- $\gamma$  production as such we hypothesize that RORa may transcriptionally regulate IFN- $\gamma$ . To identify this mechanism, we will create various truncated RORa constructs to assess its activity in regulating IFN- $\gamma$



through biochemical and molecular immunological techniques, including Luciferase assays and phenotypic analysis via Flow Cytometry. Through these studies, we aim to better understand the mechanism behind the ROR $\alpha$ -dependent repression of IFN- $\gamma$ .

Poster - afternoon

Environmental, Ecological & Marine Sciences

**86. Temperature Effects Early Embryonic Growth in Loggerhead Sea Turtles (*Caretta Caretta*)**

By: Hannah Mauer, Emily Turla, Jeanette Wyneken, and Sean Williamson

Faculty Mentor(s): Jeanette Wyneken and Emily Turla

Presenter(s): **Hannah Mauer**

Temperature affects the rate of embryonic development of sea turtles including changing the growth rate. Embryos cannot be directly observed because of the eggshell, however, as embryonic development proceeds the eggshell changes from cream-colored to chalky white (white spot formation). This change indicates that the embryo and its membranes are forming. Different temperature conditions may affect the white spot growth, which can be used as a proxy for early embryonic growth. In this case, Loggerhead sea turtle eggs were incubated in 28°, 30°, or 32°C with a moisture level of 6% in sterilized sand and were photographed once or twice a day for the first 7 days of incubation (162 images) to record changes in the white spot development. Using Image J, measurements of the diameter of each white spot will be used to compare developmental progress. The anticipated outcomes are that higher temperatures will cause a faster growth rate.

Poster - morning

Health & Medical Sciences

**87. Prevalence of Legionella Species in Potable Water Systems in a University Campus Using the CDC Elite Protocol and Molecular Identification**

By: Ednie Saint Eloi, Lauren Sankar, Arthi Khan, Deena Davis, and Nwadiuto Esiobu

Faculty Mentor(s): Nwadiuto Esiobu

Presenter(s): **Ednie Saint Eloi**

The focus of this research is to compare the reliability, and accuracy of the current CDC standardized test for Legionella in potable water systems and molecular detection protocols. A secondary aim was to address the prevalence of Legionella in Florida Atlantic University water systems, identify the genomic diversities, and recommend an improved protocol for Legionella detection. Ten water samples from the gym and residential hostels were collected and tested for the presence of Legionella species using the CDC Elite culture methods and serology tests. Molecular assays employed Sanger sequencing of

16S rRNA for isolates to identify groups indistinguishable by the CDC methods. Combining the CDC Elite with molecular confirmatory tests presents the most sensitive and rapid testing methods.

Poster - afternoon

Music, Art, Literature, Theater, History & Philosophy

**88. Daughters of Hidden Waters: Exploring the Practice of Sincretismo de Protección in Morisca Ablution Rituals**

By: Florinda Cano

Faculty Mentor(s): Yolanda Gamboa

Presenter(s): **Florinda Cano**

In 1492 the Spanish city of Granada fell to Catholic control, simultaneously ending the Ibero-Muslim empire of Al-Ándalus and acting as the final victory of the Reconquista. As Ibero-Muslims were forced to convert or face expulsion or death, moriscas (Iberian crypto-Muslim women of the early modern period) continued practicing crypto-Islam. The moriscas constructed a mechanism I call sincretismo de protección to sustain their religious and cultural rituals, including the Islamic ablution rituals of wudu and ghusl. I propose that the term sincretismo de protección refers to consciously enacted outward modification of orthodox religious ritual performed by religious crypto-practitioners under intense religious persecution and duress. Moriscas used this mechanism to continue their ablution rituals, which resulted in the creation of crypto-Islamic morisca ablutions; meaning that the moriscas' particular enactment of these ablutions under their clandestine circumstances resulted in physical modifications of these rituals, while their core internal ritual intentionality remained intact.

Poster - morning

Health & Medical Sciences

**89. Conformational and Proteolytic Analysis of APP Model Glycopeptides**

By: Gustavo Mundim, Maria Eduarda Vezzi, Nancy Vela, Ramya Ayyalasomayajula, Ivet Boneva, Valentina Sopo, Dmitriy Minond, and Mare Cudic

Faculty Mentor(s): Mare Cudic

Presenter(s): **Gustavo Mundim** and Maria Eduarda Vezzi

Alzheimer's disease (AD) is one of the most common neurodegenerative disorders linked to aging. Evidence continues to emerge supporting the idea that deficiencies in amyloid- $\beta$  precursor protein (APP) trafficking and clearance of A $\beta$  peptides are the initiating events of AD pathogenic processes. Efforts to understand the role of APP proteolytic cleavage by  $\alpha$ -,  $\beta$ -, and  $\gamma$ -secretases into the toxic amyloidogenic pathway have sparked interest in the role of MUC-type O-glycosylation in the production and clearance of A $\beta$  peptides. With this goal in mind, we have synthesized native and Swedish-mutated (Lys670Asn/Met671Leu) (glyco)peptides with O-GalNAc moiety on Thr663 or

Ser667 to explore the role of glycosylation on conformation and secretase activity. The sequences incorporate the  $\beta$ -secretase (BACE-1) (M671~D672 or L671~D672) and  $\alpha$ -secretase (ADAM-10) (K687~L688) cleavage sites, located near and within the A $\beta$ 40 domain, respectively. CD analysis was conducted in four solvent systems to evaluate the peptide environment and O-glycosylation-induced conformational changes.

Poster - afternoon

Cross Disciplinary Projects

### **90. Intrinsic Drunkenness in Auto-Brewery Syndrome – A Systematic Review**

By: Lea Goldenberg and Lincoln Sloas

Faculty Mentor(s): Lincoln Sloas

Presenter(s): **Lea Goldenberg**

Auto Brewery Syndrome (ABS), also referred to as Gut Fermentation Syndrome and Endogenous Ethanol Fermentation, is shown to be rare and highly under-diagnosed within the medical community. This study explores ABS through the medical lens, utilizing a sample of 20 scholarly, peer-reviewed articles sourced from PubMed, a medical research journal. Additionally, a criminal justice and criminology perspective is further analyzed through three prominent cases in which individuals claimed ABS as a defense for alcohol related charges. Using Leximancer software, a full literature analysis is provided on the medical knowledge and suggests possible further application, while stressing the necessity of further research on this largely unexplored phenomenon.