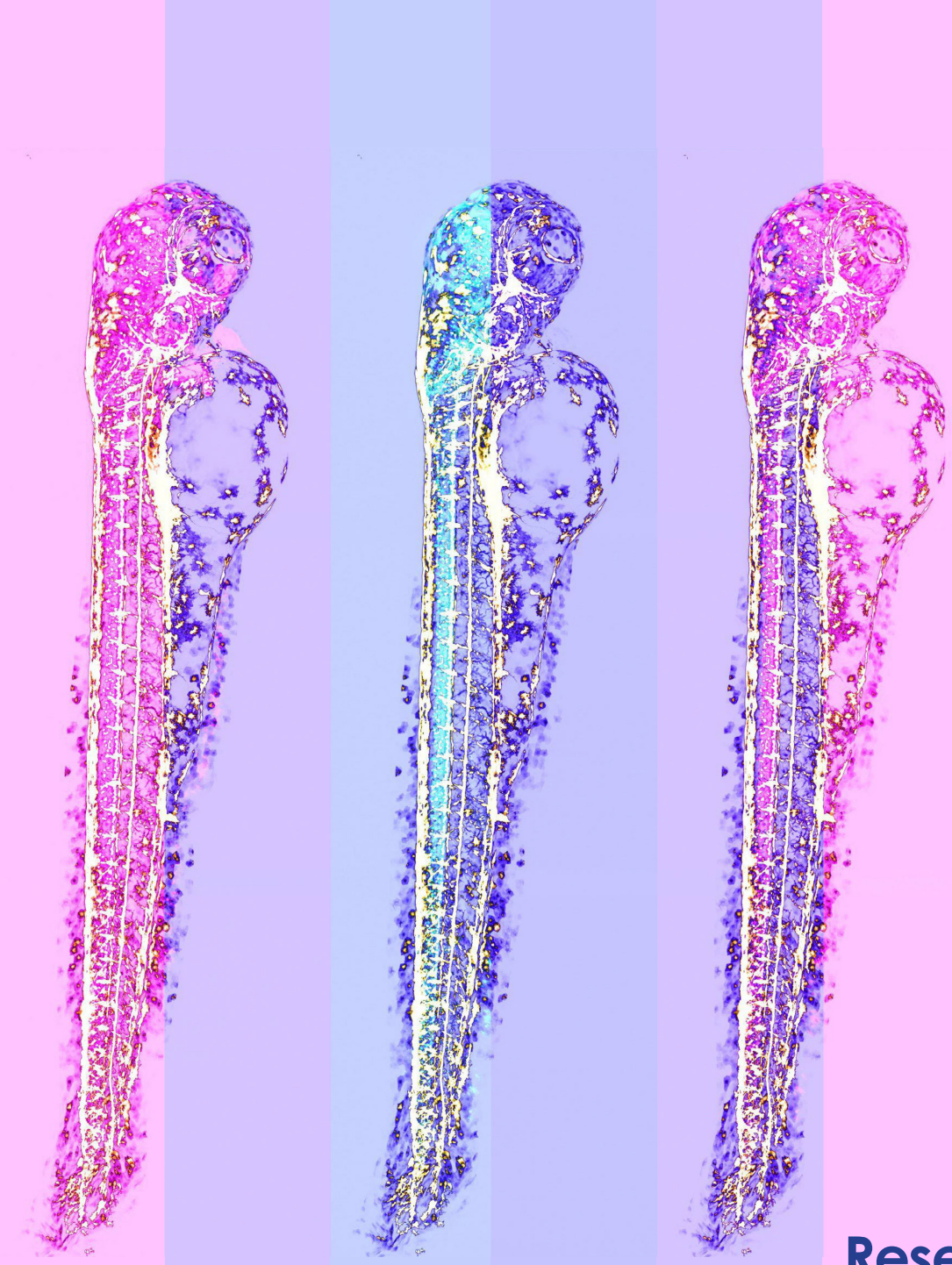


FLORIDA ATLANTIC UNIVERSITY

Undergraduate
Research and Inquiry

15th Annual Undergraduate Research Symposium

April 4, 2025

WELCOME

Welcome to the 15th Annual Undergraduate Research Symposium, which showcases undergraduate students at Florida Atlantic who are engaged in research, scholarship and creative activities. Students present their findings through poster or visual arts, and oral or performing arts presentations; and represent all disciplines, all colleges, and all campuses of FAU.

Few activities are as intellectually rewarding 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.

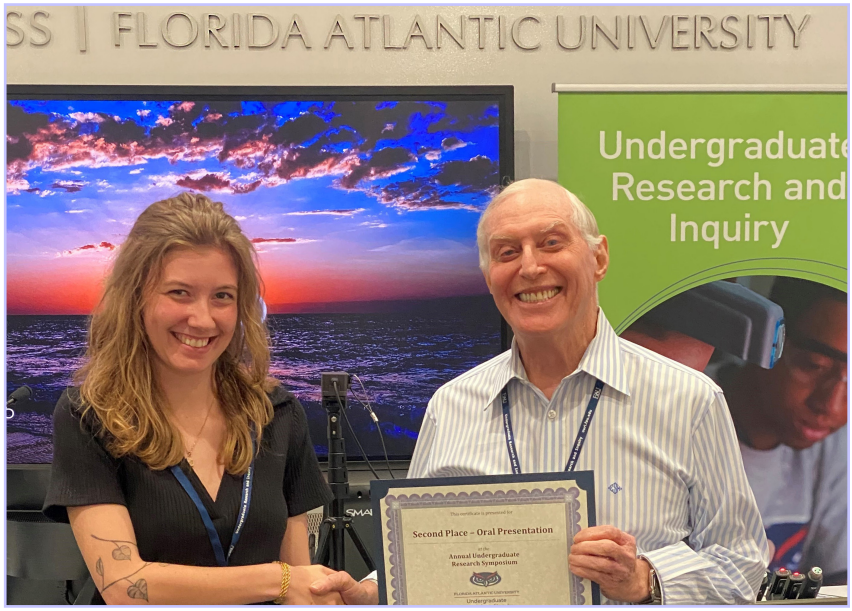
Again, we are pleased to offer cash awards for first-place oral winners in all categories, thanks to the generous donation of Dr. Eric H. Shaw, Emeritus Professor, College of Business. We are grateful to Dr. Shaw's support of the Undergraduate Research initiative and our student scholars.

The Office of Undergraduate Research and Inquiry (OURI) serves as a centralized support office for 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, the Learning Environment and Academic Research Network Program (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/ouri.

SPECIAL THANKS TO...

Council for Scholarship and Inquiry (CSI)
Division of Research
Division of Student Affairs
Faculty Judges
Faculty Mentors & Advisors
Graduate and Professional Student Association (GPSA)
The Graduate College
OURI Faculty Liaisons & Peer Mentors
Staff & Student Volunteers
Undergraduate Studies
University Communications – Marketing and Creative Services
University Libraries



We are extremely grateful for the generosity of
Dr. Eric H. Shaw, Emeritus Professor, College of Business,
in his continued support of Undergraduate Research at FAU.

(Pictured above with 2024 Second Place winner in Cross Disciplinary Projects, August Stone)

TABLE OF CONTENTS

AGENDA

UNDERGRADUATE RESEARCH SYMPOSIUM
FRIDAY APRIL 4TH, 2025

FLORIDA ATLANTIC UNIVERSITY
Undergraduate
Research and Inquiry

8:00 am to 4:00 pm	ON-GOING REGISTRATION	Schmidt Family Complex Lobby
8:00 am to 10:00 am	REFRESHMENTS (COFFEE)	Schmidt Family Complex Hallway
8:30 am to 8:50 am	WELCOME MESSAGE FROM PRESIDENT HASNER	SFC 107
9:00 am to 10:00 am	POSTER SESSION I (MORNING)	Schmidt Family Complex Lobby/Hallway
10:15 am to 11:45 am	ORAL SESSIONS	SFC 109, 112, 114, 116, 118, 122, 127
11:45 am to 12:15 pm	LUNCH	Schmidt Family Complex Lobby
12:30 pm to 1:30 pm	*KEYNOTE PANEL: "SHOOT HAPPENS"*, WITH TED deCHATELET AND STUDENT CAST & CREW	SFC 107
1:30 pm to 1:50 pm	*DR. ERIC H. SHAW ORAL PRESENTATION AWARD WINNERS ANNOUNCED*	SFC 107
2:00 pm to 3:00 pm	POSTER SESSION II (AFTERNOON)	Schmidt Family Complex Lobby/Hallway
3:15 pm to 4:15 pm	POSTER SESSION III (LATE AFTERNOON)	Schmidt Family Complex Lobby/Hallway

DIRECTIONS

KEYNOTE PANEL

THE MAKING OF THE FIRST FAU FILM PROJECT – "SHOOT HAPPENS"

This panel discussion will focus on the process of writing/filming/editing the first-ever FAU Film Project – "Shoot Happens".

"Shoot Happens" is a roughly 50-minute original film produced by the Department of Theatre and Dance. Over the past few years, the Department has developed numerous classes in camera acting (and a new minor in Acting for Camera). Theatre and Dance primarily teaches acting classes for the stage and we produce six plays each year so students can put into practice what they are learning in class. We realized that the students needed a similar experience for camera. So, we developed the "Film Project".

We spent all year working on it. In the Fall, we established a "writers' room" with four students, and two faculty. Together, we wrote an original screenplay about a group of college students in a film club. We cast the piece in November and shot it during January and February. All told, over 40 students contributed to the film. They served as writers, actors, crew, costume, makeup, script supervisor, gaffer, camera operator, 1st Assistant Director, sound, editors, music supervisor, and production assistants. We are currently in post-production (editing) and hope to have a premiere before the end of the term.

It's been a tremendously rewarding challenge and we are so excited to share the work with the FAU community. We plan to submit the film to festivals all around the country beginning in the Fall of 2025.

PANEL MODERATOR:
Ted deChatelet, MFA, (Director, Writer, Producer)
Assistant Professor of Acting (Camera/Shakespeare)
Dorothy F. Schmidt College of Arts and Letters, Florida Atlantic University

PANELISTS:
Erik Lucatero, Filmmaker (Director of Photography, Editor, Mentor)
Toni Toriano, Student (Writer, Actor)
Aurora Colamonici, Graduate Student (1st Assistant Director, Producer)
Emilia Borean, Student (2nd Assistant Director, Production Assistant)
Angelo Azar, Student (Writer, Camera Operator, Editor)
Erin Mcqueeney, Student (Actor)
Eliana Alzate, Student (Actor)

2024–25 AWARDEE

DISTINGUISHED MENTOR OF THE YEAR

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.

Dr. Catherine Trivigno
Instructor of Biology
Harriet L. Wilkes Honors College

Dr. Trivigno is a proud alumna of Florida Atlantic University. After graduating from FAU in 2010 with a PhD in Integrative Biology, she pursued additional training in cancer biology and regulation of gene expression at the University of Miami Miller School of Medicine and the Scripps Research Institute.

Since joining the Honors College as a faculty member in 2018, Dr. Trivigno has had the privilege of serving as honors thesis advisor to 31 undergraduate students as well as serving as a second reader on thesis committees for 24 students. She is also especially proud of her mentorship of a total of 64 undergraduate researchers in the Nambu Summer Research Experience Program and the Morton Research Fellows Program. In addition to her work with her research students, Dr. Trivigno has enjoyed serving as faculty advisor for multiple student organizations, including the Research Endeavors Society, the Honors Pre–Medical Society, the American Cancer Society on Campus Club, and the Pokémon Go Club.

Dr. Trivigno hopes that by engaging and supporting her students, she can help them develop the skills they need to succeed in the classroom, in their research endeavors, and beyond. It's been a privilege for her to watch these students rise to the challenges they face as they develop as researchers, to see the pride they take in their accomplishments, to celebrate with them when they graduate, and to hear from them when they reach out to share their achievements in their graduate or professional programs. To play a part in their journeys is a great honor, and Dr. Trivigno wishes to express her sincere gratitude to OURI, the Honors College, and the FAU community for the incredible opportunities and unwavering support they have provided to her and her students.

2024–25 AWARDEES

UNDERGRADUATE RESEARCHER 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 an "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!

Ty Craaybeek
Dorothy F. Schmidt College of Arts and Letters
Faculty Mentor: Michael Hamilton

Alexander Aranda
College of Business, *Allen E. Smith Awardee*
Faculty Mentor: Eric Levy

Vritti Sodha
College of Education
Faculty Mentor: María Vásquez

Zade Micallef
College of Engineering and Computer Science
Faculty Mentor: Pak-Cheung E. An

Vincent Stafford
Harriet L. Wilkes Honors College
Faculty Mentor: Terje Hill

Gabriella Maxey
Charles E. Schmidt College of Medicine
Faculty Mentor: Ning Quan

Helen Grammen
Christine E. Lynn College of Nursing
Faculty Mentor: Candy Wilson

Hannah Epstein
Charles E. Schmidt College of Science
Faculty Mentor: Marianne Porter

2024–25 NOMINEES

PRESTIGIOUS FELLOWSHIPS

Florida Atlantic University supports students and recent alumni in pursuing prestigious fellowships, which are nationally competitive, merit-based awards. Prestigious fellowships offer many opportunities to develop and connect your academic and personal interests. They provide funding to help you conduct research, study abroad, pursue public service and social justice work, attend graduate school, and much more. Florida Atlantic's fellowship advisors work with undergraduates, graduates, and recent alumni. We help you determine which opportunities align with your goals and assess your eligibility, and once you identify the right fellowship, we support you through the application process. We are proud to celebrate the following students for being nominated this year.

FULBRIGHT U.S. STUDENT SCHOLARSHIP

David Baldwin
Semi-finalist*

Caitlan Corish
Nominee

Autumn King
Nominee

Charlie Landstrom
Semi-finalist*

GOLDWATER SCHOLARSHIP

Hannah Epstein
Nominee

Aiden Geleta
Awardee

Vincent Stafford
Awardee

*Pending national award decision

For more information, please visit fau.edu/fellowships:

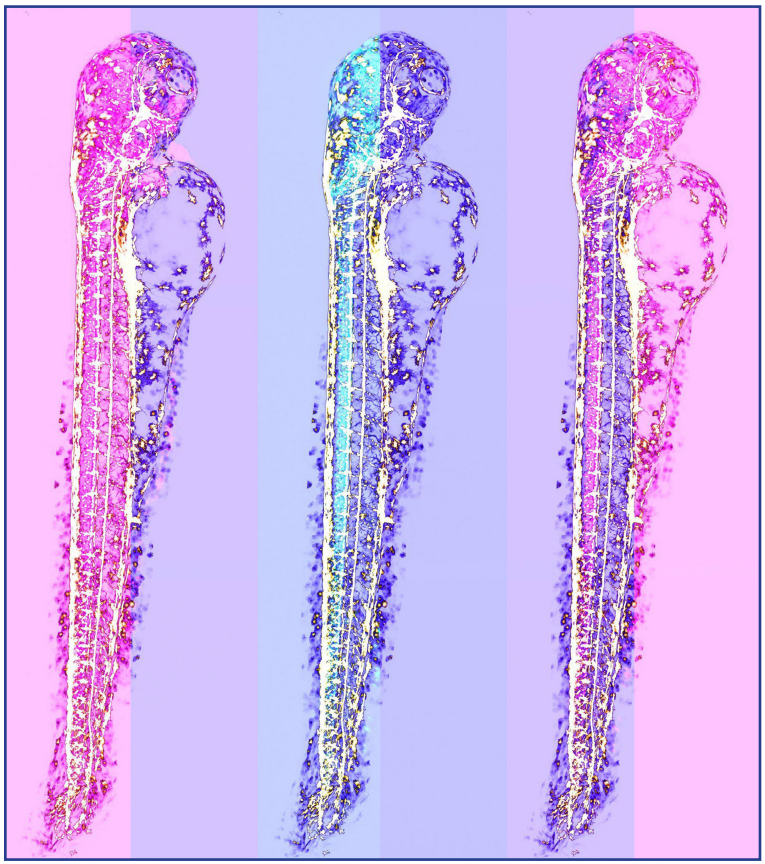
For questions, please contact:

Jessica Cornely, *Associate Director for Prestigious Fellowships*
Email: jcornely@fau.edu
Phone: 561-297-4161
Location: GS-2, Suite 209 F

COVER ART STATEMENT

"THE ART OF TRANSGENESIS"

This is an image of three transgenic zebrafish embryos at 72 hours post fertilization. The zebrafish embryos were imaged using a confocal microscope (10X objective). The Fiji and Imaris software were then used to process and edit the images into this colorful montage, which works to bring attention to the beauty and power of transgenic lines. Transgenesis involves artificially introducing a modified gene into an organism. The transgenic zebrafish imaged for this project express fluorescent markers that allow for cells expressing select genes to fluoresce. The resulting colors are invaluable for studying various cell types, protein expression, biological processes, etc. and provide an astonishing artistic masterpiece filled with color.



Addison Manofsky
Undergraduate student,
Harriet L. Wilkes Honors College &
FAU High School

FLORIDA ATLANTIC UNIVERSITY

Undergraduate
Research and Inquiry

ATTENTION STUDENTS!

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

Submit to the UNDERGRADUATE RESEARCH JOURNAL

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

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

ELIGIBILITY:

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

For more information please visit fau.edu/ouri/ug-research-journal/:

BECOME A PEER MENTOR

WHAT'S IN IT FOR YOU?:

- earn monetary stipend
- gain experience in leadership & teamwork
- guide, mentor, & inspire your peers
- expand awareness of undergraduate research at FAU
- plan & host workshops to expand research culture
- have tons of fun!

ELIGIBILITY:

- good academic standing at FAU
- at least one semester of documented research or scholarly experience

For more information & the application, visit fau.edu/ouri/peer-mentor-program/:

APPLICATION DEADLINE FOR BOTH: MAY 30TH

QUESTIONS? EMAIL: ouri@fau.edu

SF 122 ORAL PRESENTATIONS 10:15 am to 11:45 am

In the Eyes of the Consumer: Food Labels and Safety in America

By: Taylor Smith
Faculty Mentor: Eric Levy
Presenter: Taylor Smith

The American food industry plays a key role in the economy, but concerns have grown about the safety of packaged foods due to harmful additives and preservatives. While some view it as a major health issue, others remain unaware. To explore this, I conducted a survey assessing public knowledge of the U.S. food system, focusing on gender differences in food label–checking habits and perceptions of food safety. The survey, with 152 responses via Amazon MTurk, revealed significant gender differences. 88.3% of females check ingredient lists often, compared to 69.9% of males. Additionally, 7.7% of females find packaged food somewhat unsafe, compared to only 1.4% of males. These differences highlight that females are more attentive to food safety, suggesting important implications for future awareness of this issue.

Monetary Incentives In Public Health

By: Andreas Uudmae
Faculty Mentors: Eric Levy and Monica Escaleras
Presenter: Andreas Uudmae

We are facing an obesity crisis and struggling to deal with it. Economics could show us how to deal with this issue effectively. Monetary incentives could promote healthier behaviors in people and bring down the obesity rate. The purpose of my research is to investigate public opinion on offering monetary incentives to improve public health. I wrote a 20–question survey, distributed it through Amazon MTurk, and received 164 completed surveys. I'm testing to see if there is a statistically significant difference in opinions of men and women on these incentives being offered. Most notably, there was a statistically significant gender difference in opinions of the government providing positive monetary benefits for participating in fitness challenges. These results were statistically significant at the 1% level of significance. By incorporating gender differences into policies, there may be new approaches to improve public health, especially when utilizing monetary incentives to create change.

A Pharmacists' Role in Antibiotic Overprescription: A Qualitative Analysis of Patient–Pharmacist Interactions and Implications for Antimicrobial Resistance

By: Kezia Abraham and Katharina Rynkiewich
Faculty Mentor: Katharina Rynkiewich
Presenter: Kezia Abraham

Leading to antimicrobial resistance and the development of superbugs, the incentives of antibiotic overprescription can be analyzed from the perspectives of pharmacists. Grounded in long–term, in–depth observation (N = 104 hours) of patient–pharmacist behavior at three private pharmacies in Palm Beach County, the researcher took handwritten notes on patient–pharmacist behavior and detailed timestamps for each patient, also recording patient demographics and details surrounding antibiotic prescription, pain medications, medical procedures, and medication dispensing. Supported by the Ethnography Lab at Florida Atlantic, the researcher qualitatively coded the documents using Dedoose qualitative analysis software, ultimately describing scenarios like patient education and multiple prescriptions. Patients were observed disclosing important information to their pharmacist, and pharmacists were observed relating to the patient to create a well–rounded prescription and dosing regimen. Discerning socio–professional interactions in healthcare settings is pertinent to understanding processes and behaviors surrounding medication prescribing that could impact global health issues like antimicrobial resistance.

SF 122 BASIC SCIENCES

10:15 am to 11:45 am

Designing Small-Peptide Inhibitors Targeting the N-Terminus and Central Hydrophobic Core of Aβ40

By: Tatiana McFarlane, Seymour Haque, and Deguo Du
Faculty Mentor: Deguo Du
Presenter: Tatiana McFarlane

Alzheimer's disease (AD), the leading cause of age-related dementia, affects 50 million people worldwide. The amyloid cascade hypothesis identifies amyloid-β (Aβ) accumulation as a key driver of AD pathology through various mechanisms: impairing synaptic function, triggering neuroinflammation, and inducing neuronal damage. While aggregation is largely mediated by Aβ's hydrophobic core and C-terminal through inducing β-sheet formation, the N-terminal region also plays a crucial role in aggregation propensity. Therefore, we designed small-peptide inhibitors targeting the N-terminus and hydrophobic core of Aβ40. Using PEP-FOLD4, we generated 20 de novo peptides and screened them with HPEPDOCK docking software, selecting the top five candidates. Multi-copy molecular dynamics (MD) simulations (10 copies, 25 ns each) were conducted to assess binding stability through hydrogen bond and salt bridge analysis. Our findings suggest that promising peptide candidates play a key role in disrupting intramolecular interactions that can drive amyloidogenesis, providing potential therapeutic agents for AD treatment.

Determining RNA-Huntingtin Interactions by APEX2-Sequencing

By: Donata Amineva and Jianning Wei
Faculty Mentor: Jianning Wei
Presenter: Donata Amineva

Huntington's Disease (HD) is a fatal neurodegenerative disorder caused by a mutated huntingtin (Htt) protein. While wild-type Htt is necessary for neural survival, the production of mutated huntingtin from a mutated HTT gene underlies the pathogenesis of HD. Htt is a scaffold protein associated with multiple cellular pathways, including trafficking, transcription and stress response. While recent findings suggest that Htt interacts with RNA, the identities of these RNAs are largely unknown. Therefore, the aim of this study was to identify the RNAs interacting with Htt protein using APEX2 proximity labeling. The results from the RNA sequencing present a distinctive role of Htt in interacting with RNAs, providing critical insights into its subcellular function; the alteration of these interactions in HD presents a plausible pathway for understanding neural degeneration. These preliminary findings are significant in clarifying the mechanisms of HD pathology, leading to the discovery of potential treatments in the future.

Microstructural Characterization of Curved Strontium Sulfate Crystals

By: Celina Detwiler Gray, Alejandra Coronel-Zegarra, Andrienne Martin, Eshita Samajpati, Alberto Perez-Huerta, Jessica Walker, and Vivian Merk
Faculty Mentor: Vivian Merk
Presenter: Celina Detwiler Gray

Biomineralization creates biologically important support structures, including shells, exoskeletons, and bones. Some biomineralization processes involve transient amorphous precursor phases, characterized by structural disorder and curved interfaces. Identification of amorphous precursors is crucial to understand crystallization pathways, yet there is a gap of knowledge surrounding earth alkaline sulfate crystallization. This study investigates biomimetic strontium sulfate ($SrSO_4$) crystallization in the presence of poly(glutamic acid) using multiscale microscopy and vibrational spectroscopy. We hypothesize that poly(glutamic acid) promotes the formation of a polymer-induced liquid precursor (PILP) phase previously found in calcium carbonate minerals. Under the Scanning Electron Microscope, we observed round crystal shapes with granular texture. Biomolecule inclusion led to pronounced peak broadening in X-ray Diffraction and Raman spectroscopy. Crystal structure was investigated with Wide Angle X-ray Scattering and polarized light microscopy, suggesting mesocrystalline order. Atom Probe Tomography, to study the three-dimensional nanostructure, revealed a helical arrangement of organic matter inside the inorganic lattice.

SF 116

BEHAVIORAL, EDUCATIONAL & SOCIAL SCIENCES I

10:15 am to 11:45 am

The Roles of Shame in Ex-Christians' Personal Experiences and Deconversion Journeys

By: Anaya Bruno and Robin Vallacher
Faculty Mentor: Robin Vallacher
Presenter: Anaya Bruno

This study explores the role of shame in the experiences of ex-Christians that eventually led to their deconversion. This study aims to contribute to the understanding of ways in which certain aspects of religiosity – particularly of more dogmatic and authoritarian faiths – may impact mental wellbeing adversely. This study also examines how religious shame is connected to sociality and normativity, and the role of discontentment in leaving faith, expanding on previous studies. Data were gathered through an open-response survey posted on two subreddits for deconverted people. Thematic analysis was then conducted to derive trends from the responses. The findings of this study will be useful in the development of more effective therapeutic interventions against religion-oriented mental ailment.

Learning About Gujarati: Cultural Identity and Family Language

By: Vritti Sodha and María Vásquez
Faculty Mentor: María Vásquez
Presenter: Vritti Sodha

Language loss is a prevalent problem that is occurring in immigrant families in the United States. Regional languages such as Gujarati are not given importance to learn, due to the lack of use outside households and gatherings. To combat this problem, community centers hold Gujarati classes for students of all ages, but the lack of motivation to learn the language remains. This study examines engaging features of a Gujarati class by identifying characteristics of active learning. Data sources include class observations, journaling and photo elicitation. Sharing findings with the local community, the manuscript will also be sent to be considered for publication. Data collection results show that cultural identity and family connection have a strong connection with the motivation to learn a family language, contributing to the overall active learning process of the student enrolled in the community-based language learning class.

An Examination of the History of Plains Indian Sign Language

By: Pearl Van Zyl
Faculty Mentors: Katharine Napora and Michael Hamilton
Presenter: Pearl Van Zyl

Plains Indian Sign Language (PISL) was used historically as a lingua franca by many Indigenous peoples of the Plains region of North America for trade, storytelling, and everyday interactions. The use of Plains Indian Sign Language throughout the Plains resulted in variations attributed as tribal dialects by outside observers. The records of these dialects express the multifaceted history of the indigenous groups of the Plains. Here, I examine historic 19th and 20th century records of PISL to determine what the sources, retention, and changes of certain aspects of signed vocabularies in these sources suggest about record-keeping, cultural interactions, and historic diffusion of sign languages across the Plains.

Analyzing Austronesian Alignment in Hiligaynon Syntax

By: Ty Craaybeek
Faculty Mentor: Michael Hamilton
Presenter: Ty Craaybeek

Hiligaynon is a language in the Philippines spoken by 10% of the population and a member of the Central-Philippine branch of the Austronesian language family. Like its relatives Cebuano or Tagalog, Hiligaynon employes Austronesian alignment. One central analysis of this system is based on the ergative-absolutive case assignment (Mithun, 1994; Aldridge, 2004). However, Chen (2017) has argued that these languages use nominative-accusative assignment, and the voicing system serves to mark topic. I reanalyzed these claims by sharing data from Hiligaynon consisting of transitives, causatives, and sentences with binding across the four voices. I sent these sentences to a native-speaking participant, who judged their grammaticality. The results were compared to the analyses present in the work of Chen (2017) to observe whether they support her claims. The results appear to support Chen's claim that Philippine-type languages follow a nominative-accusative system instead of an ergative-absolutive alignment.

SF 127

BEHAVIORAL, EDUCATIONAL & SOCIAL SCIENCES II

10:15 am to 11:45 am

Behind The Screen: How Personalized Ads Shape Your Social Media Experience

By: Luisa Lucigniani
Faculty Mentor: Eric Levy
Presenter: Luisa Lucigniani

In today's digital world, companies use personalized advertising to capture attention, making it important to understand how people view these ads, especially regarding privacy and user experience. I studied Americans' perspectives on personalized ads, hypothesizing that women would encounter more ads and make more purchases than men. To test this, I created a 16-question survey and gathered 228 responses via Amazon MTurk. Using IBM SPSS to analyze the data, I found some unexpected results. While women did encounter more personalized ads, men actually made more purchases, contradicting my second hypothesis. This finding suggests a shift in marketing strategies may be necessary, with a greater focus on male consumers to increase profitability. These insights could lead companies to rethink their approach to personalized ads, potentially targeting a broader range of consumers to maximize engagement and sales.

The Cost of Being Female: A Survey on the Pink Tax

By: Marjon Borjian
Faculty Mentor: Eric Levy
Presenter: Marjon Borjian

The "pink tax" refers to the price difference between products marketed to females versus those marketed to males, often for similar items. My research explores public perceptions of this economic issue, specifically comparing male and female responses. I hypothesized that females would view the pink tax as unfair, while males would find it fair, and that more females would support laws against it. To test this, I distributed a 16-question survey through Amazon MTURK, collecting 180 responses analyzed with SPSS. Contrary to my hypothesis, 47.8% of females found the pink tax somewhat fair, with only 9.8% seeing it as unfair. Additionally, 86% of males supported legislative action to make the pink tax illegal, compared to 73.93% of females. Notably, 26.1% of females opposed such action, versus 8.1% of males. These findings challenge assumptions about gender perceptions of the pink tax and contribute to gender-focused economic research.

What Do Americans Think About the Death Penalty?

By: Livia Vieira
Faculty Mentor: Eric Levy
Presenter: Livia Vieira

The death penalty is a controversial topic in ethical debates. Because of its contentious nature, I decided to conduct a survey to better understand the American perspective on the death penalty as a form of legal punishment. I created a 17-question survey, distributed via Amazon Mechanical Turk, and analyzed 147 responses using IBM's SPSS. My hypothesis, inspired by Hofstede's cultural dimensions theory, suggested women would support the death penalty more than men for crimes like child sexual abuse and rape. However, the results contradicted this. I found that 14.7% of women opposed the death penalty for child sexual abuse, compared to 4.2% of men. For rape crimes, 43.7% of men supported the death penalty, while 33.3% of women did. These differences were statistically significant, revealing that men were more likely than women to support the death penalty for these crimes.

"Without Them We Would be Lost": Detective Experiences and Perceptions of Violent Crime Victim Advocates

By: Colette Content and Seth Fallik
Faculty Mentor: Seth Fallik
Presenter: Colette Content

Criminal justice policy is continually evolving, and several recent efforts seek to align justice with victim wellbeing. Evidence-based approaches, including trauma-informed and victim-centered frameworks, are at the forefront of these discussions. As experts in these practices, victim advocates are poised to be a force for good in the criminal justice system; however, prior victim advocacy research and practice has overwhelmingly been limited to certain victims, crime types, and cases being adjudicated. To understand law enforcement experiences and perceptions of working with victim advocates in violent crime contexts, such as homicide and robbery, 48 detectives in the Violent Crimes Division of the Palm Beach County Sheriff's Office were surveyed. Detectives found that victim advocates 1) brought victim-centeredness to their cases, 2) aided their investigations, and 3) were of great value. The policy implications and areas of future research of this study are discussed from this research.

SF 118

BUSINESS, MARKETING, FINANCE & PUBLIC ADMINISTRATION

10:15 am to 11:45 am

Battle of the Sexes: The Impact of Gender on Household Spending and Saving

By: Carmen Benitez
Faculty Mentor: Eric Levy
Presenter: Carmen Benitez

This research investigates factors influencing American household spending behavior, focusing on gender differences. The Federal Bureau of Labor Statistics tracks spending patterns to gauge economic health. I hypothesized that gender would not impact saving, spending, and budgeting. A survey was distributed through Amazon Mechanical Turk, yielding 142 completed responses analyzed with IBM's SPSS software. The results revealed significant gender differences. While 86.1% of females noticed increased prices, only 61.8% of males agreed, a statistically significant difference of less than 1%. Additionally, 52.7% of females reported saving between $3,001 to $5,000 monthly, compared to 17.3% of males in the same range, also statistically significant at the <1% level. These findings contradicted my hypothesis, indicating that females are more likely to notice price increases and save more for future goals. This information could help the public understand gender-based economic differences in spending and saving habits.

Exploring Gender Differences in Financial Risk-Taking and Views on Economic Security

By: Benjamin Friedman
Faculty Mentors: Eric Levy and Monica Escaleras
Presenter: Benjamin Friedman

Research shows that men and women often have different levels of economic education, influenced by societal expectations and financial exposure. Men are typically introduced to financial concepts earlier and in more depth, which builds their confidence in taking risks. In contrast, women, who generally receive less formal financial education, tend to adopt more conservative approaches to finances, prioritizing stability, especially during uncertain economic times. Motivated by these observations, I set out to explore whether these gender differences were evident on a larger scale. I surveyed 154 participants via Amazon Mechanical Turk about their willingness to invest in volatile markets and their views on financial security. The results confirmed my hypothesis, with 31.1% of men and 12.7% of women expressing a high likelihood of agreeing with risk-taking investment behaviors. These findings highlight the need for financial literacy programs tailored to gender-specific needs.

The State of Investing

By: Alexander Aranda
Faculty Mentor: Eric Levy
Presenter: Alexander Aranda

The Aspen Institute found 44% of American workers are earning a median hourly wage of $10.22. The theme of this research is to understand individuals' investment strategies. I tested two hypotheses. First, is there a significant difference between gender and investment strategy; and second, is there a significant difference between gender and obtaining a retirement account. I found that women are more risk-averse, while men tend to be willing to take on more risky investments. For example, 33% of men said they would invest in cryptocurrency while only 10% of women would invest in this type of investment. Another key finding was that men seem to have a more proactive stance obtaining a retirement account compared to women. Overall, the results of this research look to compare key differences with how men and women think about investing and their exposure to different risk levels.

Navigating Justice: Perspectives on AI's Role in Court

By: Jacobo Fabregas Navas
Faculty Mentors: Eric Levy and Monica Escaleras
Presenter: Jacobo Fabregas Navas

The judicial system has faced both support and criticism, raising questions about its fairness. This has led to discussions on whether AI could play a role in judicial processes. To explore this, I created a 16-question survey and distributed it to U.S. residents aged 18 and over via Amazon Mechanical Turk. I tested two hypotheses: whether there's a significant difference between gender and views on fairness, and whether opinions differ on incorporating AI into the system. Using IBM SPSS for analysis, I found that 19% of men believe the system is very fair, compared to just 4.8% of women. Additionally, 87% of respondents supported AI integration, with no significant gender differences. In conclusion, my research suggests people are open to AI in the judicial system, setting the stage for future studies on its potential implementation.

SF 118

BUSINESS, MARKETING, FINANCE & PUBLIC ADMINISTRATION

10:15 am to 11:45 am

Exploring Gender Differences in Perceptions of AI's Impact on Social Media

By: Samkit Bothra
Faculty Mentors: Eric Levy and Monica Escaleras
Presenter: Samkit Bothra

Artificial Intelligence (AI) is shaping social media through content personalization and moderation, raising concerns about its influence on public opinion and trust in digital news. This study examines gender-based differences in perceptions of AI's role in social media, particularly in misinformation and creative applications. Data from 155 participants, collected via Amazon Mechanical Turk and analyzed using IBM's SPSS, supported two hypotheses: women are more skeptical of AI in news, citing misinformation concerns, but view AI as less problematic in creative content. Women were more likely than men (56.3% vs. 43.4%) to see AI as 'somewhat beneficial' in creative applications, yet 37.5% strongly agreed AI increases believable fake news, compared to 18.4% of men. These findings highlight the need for AI developers and social media platforms to address trust issues in AI-generated news while leveraging AI's potential in creative fields to enhance user experience and inclusivity.

Denoising Three-Photon Image Time Series using an Unsupervised Deep Learning Algorithm

By: Nicholas Price, Arani Roy, and David Fitzpatrick
Faculty Mentors: Tucker Hindle and Arani Roy
Presenter: Nicholas Price

While it is able to image 50% deeper than 2P microscopy, due to the lower laser repetition rate and lower emission probability in 3-photon (3P) microscopy, the images are susceptible to high levels of noise. Thus, efficient denoising methods are crucial to improve the signal-to-noise (SNR) ratio in 3P data. Current denoising methods are either not optimized for 3P images or are unable to maintain temporal fidelity post denoising. Using DeepCAD-RT, an unsupervised deep learning algorithm, we developed a denoising model for 3P image time series. DeepCAD-RT uses neighboring frames to determine ground truth, improving the SNR. We trained DeepCAD-RT using a variety of low SNR 3P image time series and adjusted the number of epochs, dataset size, patch size, and overlap factor. Preliminary testing has shown that the resulting model is able to improve SNR by 95% over an image time series while maintaining temporal fidelity.

Health Monitoring of Members under Compressive Load Based on Frequency Response

By: Ruby Aubin, Madasamy Arockiasamy, Raja Chandrika Revella, and Surya Teja Gollapalli
Faculty Mentor: Madasamy Arockiasamy
Presenter: Ruby Aubin

Structural health monitoring to detect small-scale deteriorations is a multifaceted issue in structural engineering. Previously, the change of bar resonant frequencies under compression were used to address this. To detect structural distress, a more sensitive detection method of string-based resonance is proposed. Driven via a tone generator, the string, attached to a wooden I-beam, achieves resonance when driven at its natural frequency. As compression was applied to the I-beam, the string's tension changed as the compression transferred to the string. The frequency of the string was found to be inversely proportional to the applied load, as less tense strings have lower resonant frequencies. In the future, the proposed study will examine how the sound waves generated by the tone generator impact the beam. The resulting deformation in the wooden specimen from applied compressive force and the effect of the sound wave propagation on the string will be evaluated.

SF 114

ENVIRONMENTAL, ECOLOGICAL & MARINE SCIENCES

10:15 am to 11:45 am

Zooming in on Bonnetheads: Quantifying Sexual Dimorphism in Denticle Morphology

By: Madeleine Hagood, Tricia Meredith, and Marianne Porter
Faculty Mentor: Marianne Porter
Presenter: Hannah Epstein

Shark skin is covered by the crowns of dermal denticles, tooth-shaped scales, whose bases are embedded into the dermis. Denticles provide benefits including protection and enhancements to swimming speed. Limited research has been conducted to investigate the ontogenetic and sex differences of denticle morphometrics in the *Sphyrna tiburo* (bonnethead shark). We hypothesized that embryonic denticles would be smaller than mature denticles as seen in other species. We also hypothesized that females would have larger denticles to provide more protection while mating. We used scanning electron microscopy to image denticles and measured denticle morphometrics and overlap with ImageJ. We found that denticles of embryonic sharks are smaller and narrower compared to denticles from juvenile and mature sharks. We also found few differences between male and female bonnethead shark skin. Understanding the developmental and functional adaptations of shark denticles provides insights into their evolutionary role and could inform applications in bioengineering.

Taking a Closer Sniff: Quantifying Structural and Sensory Olfactory Morphology in the Blacktip Shark

By: Nicole Demaras, Aubrey Clark, Marianne Porter, Tricia Meredith, and Lauren Simonitis
Faculty Mentors: Lauren Simonitis And Marianne Porter
Presenter: Nicole Demaras

The elasmobranch olfactory system detects odorants as water flows through olfactory rosettes. Rosettes consist of lamellae which are covered in sensory and non-sensory epithelium. Lamellar microstructure varies by position along the rosette. Previous studies have focused on extreme morphologies, such as elongated hammerhead shark rosettes or spherical dogfish rosettes. Here, we describe the intermediate rosette morphology of blacktip sharks (*Carcharhinus limbatus*). We hypothesized that, like other species, blacktip lamellar microstructure varies by location. Using scanning electron microscopy (SEM), we analyzed total lamellar surface area, secondary folding, and sensory surface area. We found that medial lamellae exhibited less sensory area, and both medial and lateral lamellae had fewer secondary folds. Using CAD models of the olfactory rosette, we will investigate hydrodynamic patterns that may explain morphological differences in lamellae. This project enhances our understanding of shark olfactory morphology, with the potential to inspire highly sensitive, non-clogging liquid chemical sensors.

MUSIC, ART, LITERATURE, THEATER, HISTORY, PHILOSOPHY I

SF 112

Mobilizing Motherhood: A Comparative Analysis of Women's Movements in Chile and Argentina, 1970s–1980s

By: Kris Barrios
Faculty Mentors: Eyal Weinberg and Carter Koppelman
Presenter: Kris Barrios

Between the 1970s and 1980s, Chile and Argentina experienced extreme political turmoil under the dictatorships of Augusto Pinochet and Jorge Rafael Videla. Against this backdrop of hyper-masculine authoritarian regimes, women took to the streets to protest. In Chile, the Poder Femenino movement sought to defend their country from a perceived communist menace. In Argentina, the Las Madres movement sought reparations for their children caught in the crossfire of their country's war on Marxism. This project analyzes these two women's movements, juxtaposing their distinct political agendas while highlighting their subversion of patriarchy. My research shows that the Poder Femenino and Las Madres movements utilized their unique identities as wives and mothers to recruit women to their causes and advocate for change, ultimately demonstrating how women are major actors in the rise and fall of authoritarian regimes.

Pachyderms in the Palace: Understanding the Spread of Islam in India Through the Symbolism of Elephants

By: Mary Elynne Butler
Faculty Mentor: Douglas McGetchin
Presenter: Mary Elynne Butler

Throughout the Ghaznavid Empire (10th to 12th c.), Delhi Sultanate (13th to 16th c.), and Mughal Empire (16th to 19th c.), Islamic powers in India have used the elephant, a controversial symbol in Islam, as a representation of their power and influence in India, where the animal is associated with Hindu deities and spiritualism. This paper argues that the relationship between Muslim rulers and their Hindu subjects was characterized by their use of elephants in symbolic and military capacities. Using religious texts from both Islam and Hinduism to provide context, this paper also consults scholarly articles to further explore the use of elephants in warfare and battle, as well as the Abbasid Caliphate's response to the rulers in India adopting such a controversial symbol. The understanding of this dynamic contributes to the understanding of medieval tactics and strategies used by minority ruling elites to maintain power.

SF 112

MUSIC, ART, LITERATURE, THEATER, HISTORY, PHILOSOPHY I

10:15 am to 11:45 am

Faith, Intersectionality, and Afrofantasy as a Site of Reclamation

By: Alexandrea Holder
Faculty Mentor: Ian MacDonald
Presenter: Alexandrea Holder

Afrofantasy–literary works which center fantastical elements rooted in African or African diasporic cultures, religions, folklore, or mythology to reimagine or transform our reality–is an emerging subgenre of speculative fiction. The interplay of African and Western religious systems is a common theme in Afrofantasy produced by authors within the African diaspora of North America and the Caribbean, in particular, Black women writers. I examine the relationship between literature, religion, and intersectional marginalized identities, to prove how Afrofantasy serves as a vehicle for internal decolonization. To do so, I analyze *The Hundred Thousand Kingdoms* by NK Jemisin and *The Children of Blood and Bone* by Tomi Adeyemi, and I showcase readerly assessments of how Black female protagonists and religious motifs permit reclamation of identity and agency.

Unwilling Consent or Ravishment? Sexual Violence in Late Seventeenth-Century England

By: Susan Hernandez
Faculty Mentor: Ben Lowe
Presenter: Susan Hernandez

In the years between 1674 and 1700, there were thirty-three cases involving rape or ravishment processed at the Old Bailey in London. At first glance, these numbers do not denote anything unusual or out of place. However, upon closer inspection, one would see that more than half of the cases involved girls between the ages of five and ten years of age and that the rate of convictions in the trials with younger victims far exceeds the rate for teens and young women. This research shows that in addition to the victim's age, the economic ability to hire midwives or surgeons, the socio-standing of the parties involved, and the politicized structure of the courts during Charles II's reign influenced the victims' ability to prove their case.

Pitying the Opera Ghost: How Perceptions of Disability within The Phantom of Opera Romance and Influence our Sympathies

By: Izabella Perez
Faculty Mentor: Oliver Buckton
Presenter: Izabella Perez

The name *The Phantom of the Opera* brings to mind falling chandeliers, but before Andrew Lloyd-Webber's ever popular musical adaptation, *The Phantom of the Opera* existed as Lon Chaney's silent film, and before that, the original novel by Gaston Leroux. The Phantom exists as a villain to the story, a man scorned by society because the facial disfigurement he was born with, holding love interest Christine Daaé hostage until she yields to his disability and his horrific love. Throughout the multiple iterations of *Phantom*, the Phantom's disability varies in its representation, Christine's affection towards him dependent upon how his disfigurement is presented; the more horrific his disability the less compassionate she is towards him. By analyzing the Phantom's disfigurement through a disability studies lens, this thesis works to break down Christine's treatment and reaction, and by-product the audience's, to the Phantom's unmasked face and the disability he hides.

"Where Compromise Does Not Exist": The Anarchist Ideology of Sonic the Hedgehog

By: Taylor Dawkins
Faculty Mentors: Timothy Miller and Regis Fox
Presenter: Taylor Dawkins

"Keep politics out of video games" is a common sentiment being expressed recently in gaming spaces. In particular, the Sonic the Hedgehog fan community argues that discussions of politics should cease as the franchise is intended for all ages. They argue that Sonic is not a political figure, and the video games have never contained political messaging. These perspectives fundamentally misunderstand core messaging of many Sonic the Hedgehog games and the character of Sonic himself. Sonic has always stood as a political figure reflecting anarchist ideology in games and television. Through comparative analysis of three games and one television show, I will showcase specific ways the franchise encourages anarchist ideas and practices such as plot lines, character actions, and game mechanics. This messaging shouldn't be ignored in favor of comfort in fan spaces as it provides room for important discussions about freedom, community, and standing up for what is right.

SF 109

MUSIC, ART, LITERATURE, THEATER, HISTORY, PHILOSOPHY II

10:15 am to 11:45 am

"Because I Want to Fit In": Satire and Toxic Masculinity in *American Psycho* and the Manosphere

By: Jack Lewis
Faculty Mentor: Eric Berlatsky
Presenter: Jack Lewis

Recently, toxic masculinity through the form of 'red pill' and 'manosphere' content online has seen a rise, and while criticisms of it are nothing new, a certain one stands out. Using *American Psycho* by Bret Easton Ellis and it's 2000 film adaptation, this thesis will explore how toxic masculinity manifests through an analysis of the protagonist and narrator, Patrick Bateman, in his psychology and narration of the events. Through this and analyzing the role of satire in the novel and film, it will seek to find why people take the critique as endorsement, why some may gravitate towards toxic masculinity and find someone like Patrick as something attractive and aspirational rather than something to be condemned, and implications for our contemporary political and cultural moment.

Says Who? How the Censorship of Literature Deteriorates Critical Thought

By: Juliana Morente
Faculty Mentor: Wendy Hinshaw
Presenter: Juliana Morente

There have long been concerns regarding the safety of certain texts, with censurers citing protecting children and family values as the reason behind the cherry-picking of literature. However, the criteria of what makes a book "dangerous" and deserving of censorship continues to shift and evolve, raising concerns regarding the value behind book challenges as well as the psychological drive behind censurers' fervor. Primarily intended to analyze the increasing anti-intellectualism that is pushed by present day censurers, "Says Who? How the Censorship of Literature Deteriorates Critical Thought" also proves the inconsistency of censurers and book challengers' arguments, ultimately deconstructing the veil of protection that is so often donned and re-situating their literary concerns as intentional silencing of underprivileged voices or opinions that they don't personally agree with. With 36% of challenged books featuring people of color and 25% featuring LGBTQ+ characters, "Says Who?" exposes censorship as a tool to silence diversity.

9:00 am to 10:00 am

POSTER PRESENTATIONS SESSION 1

Environmental, Ecological & Marine Sciences

1 Documenting Vocal Development in Juvenile Bachman's Sparrows (*Peucaea aestivalis*)

By: Michelle Paixao, Jocelyn Goodwin, Jonah Cohen, Louna Alkurdi, Luke-Ezra Berg, May Abiri, Shanice Eduh-Duncan, Tatiana McFarlane, Yassa Raphael, Heather Wolverton, and Rindy Anderson
Faculty Mentor: Rindy Anderson
Presenters: Michelle Paixao, May Abiri, Louna Alkurdi, Luke-Ezra Berg, Jonah Cohen, Shanice Eduh-Duncan, Jocelyn Goodwin, Tatiana McFarlane, and Yassa Raphael

Vocal learning is exceptionally rare in animals. Vocal learning in young songbirds follows the same developmental stages as language acquisition in human infants and involves recognizing and repeating conspecific songs. We studied vocal development in Bachman's sparrow, a species with an unusually large vocal repertoire. We collected wild Bachman's sparrows as nestlings and reared them in the laboratory. The young birds were exposed daily to song playbacks during which time we recorded their vocal responses. We asked if young birds are more likely to call in response to Bachman's sparrow songs versus other species, and determined the ages at which males undergo three major stages of vocal development. Our study will broaden existing knowledge about song learning in songbirds and how song recognition early in life may guide the vocal learning process.

Basic Sciences

2 Finding the Distribution of the Length of the Longest Path of Acyclic Orientations on Multipartite Graphs

By: Elisabeth Rodriguez, Aiden Corcoran, and Erik Lundberg
Faculty Mentor: Erik Lundberg
Presenters: Elisabeth Rodriguez and Aiden Corcoran

The poly-Bernoulli numbers are a generalization of the classic Bernoulli numbers with many combinatorial properties. The poly-Bernoulli numbers are an interesting class to analyze due to their applications in multiple fields of mathematics such as probability, combinatorics and Algebraic statistics. We investigate the distribution of the length of the longest path on acyclic tripartite graphs, creating a recursive system of equations of generating functions with marker u that reproduces the number of acyclic orientations on tripartite graphs when $u = 1$. Once distribution is found, we will compare our results to the bipartite case in [4] with the intention of creating a generalized theorem of the length of longest paths in the multipartite case. We also plan to generalize our methods to determine how the distribution of longest paths will generally appear in the multipartite case.

SESSION 1 POSTER PRESENTATIONS

9:00 am to 10:00 am

Basic Sciences

3 Enhancing Mineral Education: 3D Printing Crystal Habits for Hands-On Learning

By: Aubree Gross
Faculty Mentor: Matthew Edwards
Presenter: Aubree Gross

As minerals grow, they develop distinct crystal habits, or external structures. Some habits are common, while others are rare and fragile. Due to their delicate nature, certain crystal habits are often excluded from hands-on educational experiences. However, accessibility to these formations is crucial for enhancing student understanding of crystal growth and mineral formation. 3D printing presents an interdisciplinary solution to this challenge. In this study, ten mineral samples with distinctive crystal habits were selected from Florida Atlantic University's collection, photographed, and 3D scanned. In collaboration with FAU's engineering FabLab, the scans were converted into 3D-printed models. These models provide a tangible learning experience while preserving the integrity of the original specimens. Additionally, they can be reproduced on demand, increasing their significance for educational use.

Behavioral, Educational & Social Sciences

4 Alzheimer's Disease and the Amyloid Hypothesis

By: Rebecca Goodman and Gary Perry
Faculty Mentor: Gary Perry
Presenter: Rebecca Goodman

Alzheimer's disease (AD) research has mainly focused on the amyloid-beta (Aβ) hypothesis, but many Aβ-targeting treatments have failed to significantly slow or stop disease progression. This has led researchers to reevaluate the role of amyloid and explore other contributing factors, including inflammation, vascular dysfunction, and gut-brain interactions. While new Aβ-targeting drugs show promise, emerging therapies such as exosome-based strategies and microbiome-targeted approaches offer new possibilities. Here we review the research behind the historical impact of the amyloid hypothesis, its contributions to FDA-approved treatments, and the shift toward a more comprehensive, multi-targeted approach. By integrating novel therapeutic strategies, researchers aim to develop more effective interventions, marking a significant step forward in the fight against Alzheimer's Disease.

9:00 am to 10:00 am POSTER PRESENTATIONS SESSION 1

Classroom Research Project/Assignment

5 Bilingual Aphasia Recovery: Role of Linguistic Similarity and Cognitive Reserve in Language Rehabilitation

By: Raquel Dyer
Faculty Mentor: Gary Perry
Presenter: Raquel Dyer

Aphasia, a language disorder caused by brain damage, affects language production and comprehension. Bilingualism is known to provide nonlinguistic benefits in healthy populations, but less is known about potential advantageous effects after neurological injury. Compared with monolingual patients, bilingual patients might have an advantage in language recovery due to neuroprotection. This article presents research exploring if the number of languages, linguistic similarities, and levels mastered before developing aphasia can lead to a faster recovery. Other factors included the age in which each language was acquired, frequency, patterns, and circumstances in which the language is used, and family language proficiency. Few studies have focused on the concept of cognitive reserve that results from multilingualism. Results showed that the age of acquisition (early/late) for second language frequency and family proficiency influenced the aphasia recovery rate. A deeper understanding of bilingualism could reveal insights into recovery and treatment of aphasia.

Engineering

6 CRAB Crane for Surf Zone Payload Transfer From a Moving Platform to Shore

By: Michel Geha, Justin Greenberg, and Luis Vila
Faculty Mentors: Pierre-Philippe Beaujean and Bryan Tomer
Presenters: Luis Vila, Michel Geha, and Justin Greenberg

Picking up and dropping off cargo in areas with no fixed seaport faces challenges such as breaking waves in the surf zone, variable beach topographies and sea bottoms, changing weather conditions; and possible unstable terrains. Nevertheless, this task is a constant necessity for military, humanitarian, and scientific actors when they require delivery of equipment, materials, and aid to remote regions. This project presents a self-portable crane that drives to the pickup and drop off locations capable of maneuvering on different types of terrains while maintaining stability. The rounded column of the crane provides a hydrodynamic profile which reduces the forces exerted by the ocean waves. Furthermore, a design that funnels the hooking elements together solves the challenge of the constant motion of the payload when required to be hoisted from a floating vessel in an autonomous way.

SESSION 1 POSTER PRESENTATIONS

9:00 am to 10:00 am

Engineering

7 Alternative Underwater Foil Actuation

By: Andrew Heyliger–Boulton, Paula Barberan, and Tyler Chute
Faculty Mentors: Pierre–Philippe Beaujean and Kevin Kusiak
Presenters: Andrew Heyliger–Boulton, Paula Barberan, and Tyler Chute

The underwater fin stabilizer is an ever–evolving form of technology that is designed to reduce the roll of large vessels and provide a smoother ride. Currently, most of its designs use hydraulic actuators to extend and retract a foil. However, there is a possibility for hydraulic oil from the actuator to leak into the ocean environment and compromise the mechanical system. The chosen design for this project is an electric linear actuator that is mounted to a fin and foil apparatus that is made to closely resemble the Quantum XT Fin Stabilizer. The purpose of our project is to create a method of actuation by extending and retracting a mock rig without the use of hydraulics. Requirements include that the actuator be waterproof, extend and retract in under 3 minutes while repeating these cycles indefinitely, and hold a total retracted force of at least 500 pounds.

Engineering

8 Carbon Fiber vs Aluminum: A Strength Comparison Between the Composites and Metal

By: Fillipe Costa and Joshua Silversten
Faculty Mentors: Tricia Meredith and Jasmine Coyle
Presenters: Fillipe Costa and Joshua Silversten

Carbon fiber is increasingly replacing aluminum in the automotive, aerospace, and robotics industries. While both materials are strong, carbon fiber is lighter, offering comparable strength without compromising structural integrity. Additionally, carbon fiber can be manufactured in–house, potentially reducing costs compared to outsourcing aluminum parts. This study aims to explore how carbon fiber's strength–to–weight ratio and cost–effectiveness make it a suitable alternative to aluminum. Mechanical testing was utilized to compare the strength–to–weight ratio of carbon fiber composite pipes—both complex and cylindrical—against identical aluminum parts. The aluminum components were commercially purchased, while the carbon fiber pieces were both created in–house and bought commercially. We anticipate in–house carbon fiber materials showing an overall lower strength than aluminum; however, preliminary cost analysis suggests that despite this, the cost savings could make in–house carbon fiber a viable option for applications prioritizing cost over durability.

Health & Medical Sciences

9 Motion Perceptual Learning in Adults with Amblyopia

By: Timothy Payne and Summer Sheremata
Faculty Mentor: Summer Sheremata
Presenter: Timothy Payne

Amblyopia is a visual disorder that causes vision impairments such as double vision, weak muscle control, and poor visual acuity. Amblyopia can be seen in various ages but is primarily present in children up until the age of 7. Treatment to minimize amblyopia is commonly done in children before the critical period. However, recent studies suggest improvement can occur using perceptual learning beyond the critical period. Perceptual learning involves developing neuroplasticity in the brain to improve vision in the amblyopic eye. Research suggests this is done using perceptual learning, such as directional tasks or moving objects, to understand how the stimulus impacts the amblyopic eye. As the perceptual learning tasks help us to understand how each stimulus works in the amblyopic eye, we could use perceptual learning to help those with visual impairments. This research focuses on whether perceptual learning with motion stimulus effectively improves acuity in adults with amblyopia.

Health & Medical Sciences

10 Assessing Dementia Risk in Trigeminal Neuralgia Patients

By: Jannah Mohammad
Faculty Mentor: Gary Perry
Presenter: Jannah Mohammad

The objective of this study was to review research inquiring into the possible association of patients with Trigeminal Neuralgia having a greater risk of developing dementia. The medications TN patients take may potentially have side effects that could lead to dementia development. Chronic pain endured by TN patients may also have an effect. Gaining an understanding on the relationship between TN and dementia could possibly amplify methodologies of prevention. The studies included 3,810 patients, approximately 762 people with Trigeminal Neuralgia (TN group) and approximately 3,048 people without Trigeminal Neuralgia (control group); both groups had a mean age of approximately 64 years of age. The two groups were compared to observe which of the two groups had a higher time from index date (the date used to define variables at the beginning of a study) to dementia diagnosis. Patients with TN have a higher risk for dementia at an earlier age.

SESSION 1 POSTER PRESENTATIONS

9:00 am to 10:00 am

Basic Sciences

11 Investigating the Effect of pH on Bacterial Antibiotic Production

By: Valentina Peña, Madelin Duffell, and Daniela Scheurle
Faculty Mentor: Daniela Scheurle
Presenters: Valentina Peña and Madelin Duffell

As the prevalence of antibiotic-resistant pathogenic bacterial species rises, so does the need for the discovery of novel antibiotics from natural sources to treat bacterial infections. This study focuses on identifying and isolating potential antibiotic-producing bacterial species from soil samples, and investigates how changes in pH can affect antibiotic production. Bacteria are first isolated from soil samples and cultured on rich medium. Once bacterial isolates are determined to be viable, they are then grown and observed in different pH conditions. After viability is determined and characterized, antibiotic production tests are conducted against safe relatives of common pathogenic bacterial species. Production of antibiotics is determined by measuring zones of inhibition. In order to characterize antibiotic-producing isolates, macroscopic and microscopic differences are observed and recorded. DNA-sequencing is then employed for further identification. Potential antibiotic-producing bacterial species may be further screened for extraction of antimicrobial substances.

Basic Sciences

12 Testing the Effects of COVID-19 Genes on Cardiac Development and Mitochondrial Health in *Drosophila melanogaster*

By: Gabriella Boehm and Jennifer Krill
Faculty Mentor: Jennifer Krill
Presenter: Gabriella Boehm

SARS-CoV-19 had drastic effects on the cardiac system, but the full effect on the cellular level related to mitochondrial apoptosis is still unknown. This study aims to isolate SARS-CoV-19 genes in cardiac tissue to determine the direct adverse effects to the heart on a cellular level. Utilizing *Drosophila melanogaster*, a GAL4-UAS-Target-Gene line cross was set up to determine the origin of the observed negative health effects. Drosophila were subjected to an endurance assay known as the Power Tower (Tinkerhess 2012) that exploited their negative geotaxi, simulating endurance exercise and then subjected to cardiac dissections and mitochondrial staining to determine mitochondrial health and apoptosis. Preliminary data in parentals shows no irregularities, indicating standard performance despite gene replacement. In the progeny, there is a slight decline in the performance on the assay, seen in a more extreme effect in the vials of female flies, but more testing is needed to indicate significance.

Behavioral, Educational & Social Sciences

13 A Systematic Review of Artificial Intelligence Uses within K–12 Classroom Assessments

By: Isabelle Yi, Shihab Siddique, Mark Quintana, and María Vásquez
Faculty Mentor: María Vásquez
Presenter: Isabelle Yi

The current advancement in artificial intelligence (AI) puts forth a requirement to explore its role in classroom settings. This ongoing systematic review explores articles describing the implications of artificial intelligence in K–12 classroom assessment, specifically formative assessment. The review focuses on answering the question: Do K–12 educators favor the use of artificial intelligence tools for classroom assessment? This review examines quantitative studies, including pre–service and in–service teachers and their technology–related literacy (e.g., AI literacy), and implications for incorporating artificial intelligence in the classroom. Successful integration of artificial intelligence in classroom settings depends upon the teacher's training and knowledge of the uses of AI. The findings of this review contribute to the field of classroom assessment in the sense that provides data on the current standings of whether or not teachers favor using artificial intelligence, inspecting the implications of AI in the classroom.

Behavioral, Educational & Social Sciences

14 The Western Perception of Nature

By: Isabella Perez
Faculty Mentor: Michael Harris
Presenter: Isabella Perez

This study investigates the Western Perception of Nature through the lens of college students in an urban context. The objective is to examine how students in American society perceive the natural world around them versus the industrial and residential areas that they live in. It is of interest to understand how the distance from nature and how American life impacts perceptions of the natural environment. The study sampled adult students at Florida Atlantic University and focused on semi–structured ethnographic interviews. Preliminary results derived from the interviews with FAU students focus on their perceptions of nature, utilizing narrative and thematic analysis.

SESSION 1 POSTER PRESENTATIONS 9:00 am to 10:00 am

Behavioral, Educational & Social Sciences

15 Do Action Identification Tendencies Influence Agency and Moral Convictions Regarding Climate Change? An Investigation of the Gap Between Beliefs and Behavior

By: Leo Goodman, Hannah Kravec, Anaya Bruno, Laura Gust, Jada Bowers, Alara Karatuna, and Robin Vallacher
Faculty Mentor: Robin Vallacher
Presenters: Leo Goodman, Hannah Kravec, and Anaya Bruno

Climate change beliefs generally have a limited effect on whether people support policies to reduce climate change (Hornsey et al., 2016). Hardly any research investigates why these beliefs don't necessarily translate into actions. Action Identification Theory posits that low-level agents are less behaviorally consistent, while high-level agents consider the moral implications of their actions (Vallacher & Wegner, 1989). It is anticipated that low-level agents will have less moral conviction of climate change and exhibit less agency in climate change combatting behavior than high-level agents. Correlational analyses were conducted between measures of Action Identification level, climate change beliefs, climate change agency, and moral convictions of climate change. This study proposes that Action Identification Theory may provide a deeper understanding of why individuals with strong beliefs about climate change can lack the agency and moral conviction to act on them.

Engineering

16 Accessible and Modular Underwater Manipulators Utilizing Magnetic Fields

By: Matteo Perez and Felipe Salvador
Faculty Mentor: Jasmine Coyle
Presenters: Matteo Perez and Felipe Salvador

Remotely operated vehicles often rely on expensive and unreliable underwater manipulators, limiting flexibility for independent researchers or small-scale projects. This project aims to develop a low-cost, compact, and modular underwater gripper that improves affordability and adaptability for underwater robotics. The two grippers developed utilize both AC and DC drive systems, using magnetic fields to transfer movement without dynamic seals, reducing the need for expensive waterproof drive systems. The design process involves manufacturing grippers and custom systems that optimize force output, water resistance, and modularity while keeping a unit cost under 100 dollars. The engineering goal is to explore options for a gripper design capable of operating underwater for over five hours, generating at least 10 newtons of force, with an interchangeable claw system. By documenting the design process, this project aims to lower the cost-associated entry barriers for ROV users while expanding the accessibility of underwater research and exploration.

Engineering

17 Density Modulation for Buoyancy Control by Absorption

By: Priscilla Xu

Faculty Mentor: Tsung-Chow Su

Presenter: Priscilla Xu

Stealth technology for underwater drones is a key section of military and tactical innovation. This study explores how absorbing materials can be used to manipulate and alter buoyancy by controlled water absorption, allowing precise sinking rate adjustments to be controllable. By analyzing materials that dynamically alter in density as they absorb water, we investigate the point at which they reach a neutral buoyancy and the implications for underwater stealth tech. These experimental observations on absorbent materials aid insights into the correlation between fluids, changing density, and floating behaviors. The findings add to the development of advanced hydrodynamic materials that can regulate buoyancy in real-time. Exploration into both adaptive and shape-memory materials shows promising directions for next-generation underwater stealth systems focused on enhancing maneuverability and underwater operation efficiency.

Engineering

18 The Impact of Fin Structures on Thermal Management in Nucleate Boiling

By: Ryan Watach, Adib Mahmoodi Nasrabadi, Mahyar Ghazvini, and Myeongsub Kim

Faculty Mentors: Myeongsub Kim and Adib Mahmoodi Nasrabadi

Presenter: Ryan Watach

Enhanced heat transfer performance is essential for effective thermal management in high-power electronics and batteries. This study experimentally examines the influence of simple, coated, dimpled, and holed fin structures on bubble growth under differing heat conditions. Using high-speed imaging, we examined bubble size, generation frequency, and contact angle changes, related to the magnitude of heat removal from heated surfaces. We found that finned surfaces show significant heat removal capacity compared to non-finned surfaces, specifically, holed geometry showed the best performance. Bubble departure diameter increases with wall temperature but decreases with subcooling, with the holed fin generating the largest bubbles, and the highest bubble generation frequency. Contact angle measurements suggest bubbles spread over the surface as the liquid temperature rises, reducing surface tension and facilitating vapor removal. The holed fin exhibits the most effective boiling characteristics, offering great insight into surface engineering techniques for thermal management in industrial and engineering systems.

SESSION 1 POSTER PRESENTATIONS 9:00 am to 10:00 am

Engineering

19 Sustainable Enhanced Oil Recovery Using Natural Seawater, Industrial Concrete Waste, and CO_2 in Carbonate Reservoirs

By: Varshini Venkat, Christina Gumbinger, Abhishek Ratanpara, and Myeongsub Kim
Faculty Mentor: Myeongsub Kim
Presenters: Varshini Venkat and Christina Gumbinger

Enhanced oil recovery (EOR) is a promising technology that can meet the increasing energy demand for fossil fuels. This study explores an eco-friendly EOR method using natural seawater, industrial waste concrete, and dissolved CO_2 to improve the oil mobility in the carbonate reservoirs. Bicarbonate and carbonate ions from dissolved CO_2, alkaline minerals like calcium from waste concrete, and low-salinity seawater alter carbonate rock wettability from oil-wet to water-wet, improving oil mobility in complex pore structures. Microfluidic porous models are employed to simulate reservoir rocks in terms of surface properties and geometrical complexity. The oil-seawater-CO_2 interactions are visualized and subsequently analyzed with high-speed microscopic imaging, FTIR, and fluorescence-based measurements. Comparative tests with surfactant flooding are conducted under identical conditions. This approach could revolutionize EOR in carbonate reservoirs, which contain 60% of global oil reserves but suffer from extremely low recovery rates while contributing to the reduction of atmospheric CO_2 concentrations.

Behavioral, Educational & Social Sciences

20 Who We Ask for Help: Gender and STEM Perceptions

By: Kennedy Dryden, Axelle Fils Aime, Samantha McKinney, and Geoffrey Wetherell
Faculty Mentors: Geoffrey Wetherell Samantha McKinney
Presenters: Kennedy Dryden and Axelle Fils Aime

Women continue to be underrepresented in STEM fields, which may be due to gendered perceptions of competence and warmth (Fiske et al., 2002). Men are often viewed as highly competent but less warm, whereas women are perceived as warm but less competent, which may shape interactions in STEM contexts. Grounded in social identity theory, this study examines how help-seeking and partner gender influence perceptions of warmth and competence. Participants (N=303) were randomly assigned a male or female partner for a math task and rated their partner post-task. We predict that male partners will be perceived as more competent but less warm than female partners, while female partners will be viewed as warmer but less competent. Additionally, participants are expected to seek more help from in-group members (same-gender partners) than out-group members. Findings will inform strategies for fostering inclusive learning environments that support women's persistence in STEM.

Behavioral, Educational & Social Sciences

21 Evaluating a Novel Method to Calculate the Learning Slope among Elderly Adults

By: Andrea Montilla, Alicia Goytizolo, Layaly Shihadeh, Merike Lang, and Monica Rosselli
Faculty Mentor: Monica Rosselli
Presenter: Andrea Montilla

Learning slopes (LS) indicate the learning rate (LR) when individuals are repeatedly exposed to the same information across trials. This study compares two methods of calculating changes in cognitive performance, testing a novel approach that controls for the first trial. Participants included 93 CN, 153 MCI, and 45 dementia individuals from the 1Florida ADRC (M (age) 71.80; 64.45% female). The Clinical Dementia Rating global score determined cognitive status. LR accuracy for the HVLT was compared across diagnostic groups, controlling for age, education, and sex. Results showed significantly higher LS percentages in CN compared to MCI and dementia groups, and in MCI compared to dementia. The novel formula demonstrated greater sensitivity to sex differences and was positively correlated with the LR of females, indicating potential biological differences in cognitive performance across aging. This study contributes to developing more effective diagnostic and intervention tools for MCI and dementia.

Basic Sciences

22 Identification of Bacterial Nutrients Regulating Dauer Formation in *Caenorhabditis elegans*: Implications for Controlling Parasitic Nematodes

By: Andrea Facusse, Gold Akinade, Anne Thomas, Paulo Adams, and Kailiang Jia
Faculty Mentor: Kailiang Jia
Presenters: Andrea Facusse, Gold Akinade, Anne Thomas, and Paulo Adams

The development of *Caenorhabditis elegans* (*C. elegans*) is significantly influenced by bacterial nutrients. Under starvation conditions, *C. elegans* enters a specialized dispersal stage known as the dauer larva, analogous to the infective larvae of parasitic nematodes. Identifying bacterial nutrients that regulate *C. elegans* dauer formation could lead to innovative methods for combating parasitic nematode infestations in crops. To achieve this, we propose screening an *Escherichia coli* (*E. coli*) deletion library, where each strain has a specific gene deleted. Some deletions may disrupt bacterial metabolism, resulting in the loss of essential nutrients that promote *C. elegans* development, thereby inducing dauer formation. By harnessing bacterial signals to manipulate nematode development, this approach could yield eco-friendly alternatives to chemical pesticides, reducing agricultural losses, boosting yields, and minimizing environmental harm. Such research holds promise for sustainable farming practices with far-reaching benefits.

SESSION 1 POSTER PRESENTATIONS FROM UNDERGRADUATE RESEARCHERS AT MIAMI DADE COLLEGE

9:00 am to 10:00 am

Behavioral, Educational & Social Sciences

23 Effects of Caffeine and Exercise on Stroop Test Performance

By: Flor B. Perez, Isabella Gonzalez, Sofi R. Rodriguez, Valentina Ugarte, Geovanny Guardiola, and Valentina Burgos
Faculty Mentor: Judy Lee Salvatierra
Presenters: Flor B. Perez, Isabella Gonzalez, Sofi R. Rodriguez, Valentina Ugarte, Geovanny Guardiola, and Valentina Burgos

This research aims to combine the effects of caffeine and exercise on cognitive performance, specifically through the completion of a Stroop Test. The Stroop Test assesses cognitive flexibility and attentional control by measuring reaction times and accuracy when processing conflicting stimuli. The study focuses on college students, randomly assigned into two groups: one group receives a 100 mg caffeine pill and the other abstains from caffeine. After a waiting period for caffeine absorption, both groups engage in moderate exercise. Following this activity, participants complete a Stroop Test to evaluate changes in reaction time and accuracy. This study hypothesizes that participants who consume caffeine and engage in moderate exercise before completing the Stroop Test will exhibit faster reaction times and greater accuracy on incongruent trials compared to those who exercise without caffeine. Findings from this research will contribute to understanding how behavioral and pharmacological interventions influence cognitive function.

Engineering

24 The Effective Application of NLP in Education Through Sentiment Analysis

By: Victor Garcia, Nathalia I. Hurtado, Kevin Zagoya, Brandon Menard, and Maria Coello
Faculty Mentor: Beth Muturi
Presenters: Victor Garcia, Nathalia I. Hurtado, Kevin Zagoya, Brandon Menard, and Maria Coello

This research examines the application of Sentiment Analysis and Natural Language Processing (NLP) in analyzing student feedback analysis over various course modalities and subjects. The study aims to test the effect of sentiment analysis in the classroom and how it can improve learning through the collection of student feedback from various sources such as course surveys, social media, and student review sites. A survey was created to gather data across multiple educational levels and backgrounds, with the goal of feeding it to an AI–based model that would provide an understanding of the effects of different teaching practices. Our research shows that most students are comfortable with the use of NLP in education, and that tailored teaching methods can enhance learning outcomes, but are concerned about potential bias and inaccuracy.

Engineering

25 Converted Slurry Printer
By: Resby Luis Joubert
Faculty Mentor: Ana Guzman
Presenter: Resby Luis Joubert

This poster presents the process of converting a nonfunctional filament-based 3D printer into a slurry-based version capable of printing with clay. The project builds on previous work in which a Cubex-series 3D printer was stripped of most of its original electronics and reconstructed with components necessary for clay 3D printing. Following the modifications, the printer was successfully restored to operational status. The current objective is to explore its capabilities using Amaco Stoneware #11 clay and to enhance its overall performance during operation.

Basic Sciences

26 Assessing the Impact of Nitrogen and Phosphate Fertilizers on the Growth of Radishes in Simulated Martian Regolith
By: Saima Akter, Ana Corina Ruiz and Melvin Garcia
Faculty Mentor: Davia Hudson-Holness
Presenters: Saima Akter, Ana Corina Ruiz and Melvin Garcia

As humanity considers life on Mars, growing food in Martian soil presents challenges due to its lack of organic matter and essential nutrients. This study examined the growth of Cherry Bell radishes in simulated Martian regolith, testing 100% regolith, 100% topsoil, and mixtures amended with nitrogen-rich (worm castings, urea) or phosphorus-rich (bone meal, super phosphate) fertilizers. Plants were grown indoors with pH, conductivity, height, and leaf growth monitored weekly. Radishes grew in the 100% topsoil and worm castings-amended soil but failed to grow in the 100% regolith and phosphorus-treated samples. Though worm castings promoted leaf growth, radish bulbs did not develop, and roots remained shallow. Results indicate Martian regolith requires organic enrichment for plant growth, but additional amendments, such as microbial inoculants, may be needed for improved nutrient absorption. This study provides insights into sustainable food production for Mars missions.

SESSION 1 POSTER PRESENTATIONS

9:00 am to 10:00 am

FROM UNDERGRADUATE RESEARCHERS AT MIAMI DADE COLLEGE

Environmental, Ecological & Marine Sciences

27 Turning Aquatic Plants into Biofuel: Optimizing Lipid Extraction from Elodea

By: Patrick Heydasch, Santiago Fort, Nicole O' Reilly, and Maria Victoria Viana
Faculty Mentor: Juan Morata
Presenters: Patrick Heydasch, Santiago Fort, Nicole O' Reilly, and Maria Victoria Viana

Aquatic plants like *Egeria densa* (Elodea) offer a promising renewable source for biofuel production due to their rapid growth and high biomass yield. This study investigates the efficiency of lipid extraction from *Egeria densa* using different solvents to determine the optimal conditions for maximizing lipid yield. Hexane, ethanol, and ethanol–hexane mixtures were tested across multiple trials. Results showed significant variation in lipid recovery, with pure hexane yielding up to 3.20%, ethanol producing a much lower yield at 1.74%, and ethanol–hexane mixtures achieving the highest yield at 61.40%. These findings suggest that mixed solvents enhance lipid extraction efficiency by leveraging both polar and nonpolar properties. One experimental run resulted in sample destruction, highlighting the importance of refining extraction procedures. The study demonstrated that solvent choice is a critical factor in optimizing lipid extraction and suggests that ethanol–hexane mixtures could be the most effective approach for *Egeria densa* biofuel production. Future research should focus on process scalability, refining solvent ratios, and evaluating the economic viability of large–scale biofuel production from *Egeria densa*.

Environmental, Ecological and Marine Sciences

28 Effects of Trial Duration and Solvent Selection on Lipid Yield from *Chlamydomonas reinhardtii* via Soxhlet Extraction for Biofuel Production

By: Kayra Balci and George Kouchma
Faculty Mentor: Juan Morata
Presenters: Kayra Balci and George Kouchma

This research investigates the effects of various trial durations, and solvents used in Soxhlet extraction on the lipid yield from *Chlamydomonas reinhardtii*. Replicated solutions were prepared by adding 10 mL of vital *Chlamydomonas reinhardtii* samples, 50 mL of soil water, and 200 mL of TAP medium, in a 500 mL Erlenmeyer flask under a laminar fume hood; and then placed on laboratory rockers. Growth was tracked using qualitative (color of algae) and quantitative (cell count) methods. After 14–28 days, cell counts were conducted to gauge growth. Soxhlet samples were selected based on algae lifespan and health, centrifuged twice, and decanted for pellets. Soxhlet extraction occurred within 24–48 hours following centrifugation; all procedures remained constant with varied trial duration and solvents. This study highlights the importance of refining extraction procedures. Further research could identify ideal conditions for lipid extraction from *Chlamydomonas reinhardtii* for biofuel production. but are concerned about potential bias and inaccuracy.

Basic Sciences

29 Targeting Glioblastoma Stem Cells with N-Substituted Methoxy Carboxamido Chalcones

By: Sofia Schraer
Faculty Mentor: Eduardo Veliz
Presenter: Sofia Schraer

Glioblastoma (GBM), a highly aggressive brain tumor, has an average survival of just 15 months. Recent studies explore chalcone and curcumin derivatives as potential GBM stem cell (GSC) treatments. Methoxy-substituted chalcones show strong anticancer effects, with some displaying sub-micromolar IC50 values. This study synthesized N-substituted 3- and 4-methoxycarboxamide chalcones to compare binding at these positions. Using alkylation or EDCI-promoted amide coupling, compounds were purified via flash column chromatography and characterized by NMR and mass spectrometry. Eight of ten analogues exhibited potent cytotoxicity against GSCs, with IC50s below 10 μM. Notably, 3-substituted compounds were more cytotoxic than 4-substituted ones, suggesting distinct binding requirements. These findings contribute to designing more effective anticancer agents and improving understanding of the A-ring substitution.

SESSION 1 POSTER PRESENTATIONS 9:00 am to 10:00 am

Classroom Research Project/Assignment

30 Adobe Express Case Study

By: Eriana Mendoza, Emily Loose, Olivia Gonzalez, Hannah Youssef, Ignacio Lanza-Rodriguez, Jordan O'Brien, Stephanie Moreno, Emily Neill, Isabella Celis, and Kloey Smith
Faculty Mentor: Eileen Acello
Presenters: Eriana Mendoza, Emily Loose, Olivia Gonzalez, and Emily Neill

This research focuses on repositioning Adobe Express to better engage college students, educators, and administrators, addressing challenges of brand awareness and perception. Through a combination of 30 in-depth interviews, 332 student surveys, 92 educator surveys, a focus group, and interviews with industry professionals, we identified two key issues: lack of awareness regarding Adobe Express' features, pricing, and subscriptions and a common misconception that the software is complex and geared towards professionals. Based on our findings, we recommend strategies to boost awareness and engagement, such as campus ambassador programs, partnerships, targeted social media campaigns, and student-focused pricing bundles. Additionally, enhancing the user interface and overall experience can help improve adoption rates. These efforts aim to reposition Adobe Express as an accessible tool for creative expression and educational use across colleges and universities nationwide.

Environmental, Ecological & Marine Sciences

31 Assessing the Geomorphic and Sedimentological Influences of Different Borrow Source Material on Morphology and Substrate Temperature

By: Alondra Calderon, Leanne Hauptman, and Tiffany Roberts Briggs
Faculty Mentor: Tiffany Briggs
Presenter: Alondra Calderon

Sandy beaches and their ecosystems are essential in the prevention of coastal disasters. Due to the increasing pressures from climate change and frequency of extreme events, coastal ecosystems and infrastructure require long-term planning and management. Beach nourishment is a common mitigation strategy to protect against storms that occur. The objective of the study was to examine different borrow source material used in beach nourishments and the influence on beach morphology, sedimentology, and substrate temperature of the subaerial beach in northern Palm Beach County, Florida. Sites selected in this study include managed (nourished) and non-managed (control) beaches with survey transects at R-monuments: R18, R21, R34, and R41. The managed locations include borrowing material placed from inlet/offshore, upland mine, and offshore borrow sites. Time-series beach profiles, cross-shore sediment characteristics, and substrate temperature data were analyzed. Results from this study can help aid future management of beach nourishment projects for critically eroded beaches.

Environmental, Ecological & Marine Sciences

32 Retrieval of Chlorophyll Concentration from Sentinel-2 Multispectral Imagery of St. Lucie River

By: Valini Goolcharan and Tucker Hindle
Faculty Mentor: Tucker Hindle
Presenter: Valini Goolcharan

Chlorophyll-a (chl-a) is a key indicator of algae presence and water quality for harmful algae blooms. Detection of chl-a in water is possible through remote sensing of its bio-optical properties. The 1-kilometer spatial resolution presents challenges for analyzing small water bodies. The Resonon Pika XC2 sensor was integrated into the Inspired Flight IF1200A drone and acquired georectified hyperspectral imagery for a segment of the St. Lucie River in South Florida. The imagery was post-processed at sub-meter spatial resolution with 231 spectral channels in the visible and near-infrared wavelengths, 400nm to 1,000nm. The normalized difference chlorophyll index was calculated as $(\rho 708 - \rho 665) / (\rho 708 + \rho 665)$, where $\rho \lambda$ is the spectral reflectance at a particular wavelength of light. Quantification of chl-a concentration was visualized on a geographic map created using ArcGIS Pro software. Three water quality stations in the St. Lucie River validated the remote sensing data product of chl-a concentration.

Health & Medical Sciences

33 Glial Boundaries and Disease: Investigating Wif1's Role in MEP Glia and Myelination at the CNS-PNS Interface

By: Sophie Pharand-Dias and Laura Fontenas
Faculty Mentor: Laura Fontenas
Presenter: Sophie Pharand-Dias

Motor Exit Point (MEP) glia are specialized cells that myelinate peripheral motor axons at the transition zone (TZ), the interface between the central and peripheral nervous systems (CNS and PNS, respectively). This boundary prevents cells from crossing between systems. In multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS), and diabetic peripheral neuropathy (DPN), glial loss disrupts nerve function in only one nervous system, limiting repair. Investigating MEP glia development and function may uncover mechanisms that facilitate glial crossing, offering therapeutic solutions for these compartmentalized demyelinating conditions. Wif1 (Wnt inhibitory factor 1) is a specific marker of MEP glia and a Wnt pathway antagonist. To investigate its function in MEP glia, I am generating a transgenic zebrafish line where wif1 is tagged with GAL4 and crossed with UAS-driven fluorescent reporters, allowing in vivo visualization of its expression. This research enables real-time analysis of MEP glia development, with potential implications for regenerative strategies.

SESSION 1 POSTER PRESENTATIONS 9:00 am to 10:00 am

Health & Medical Sciences

34 Volumetric Analysis of the Cerebellum in Alzheimer's Disease Patients Using Magnetic Resonance Imaging Scans

By: Alexandra To, Giselle Shim, Jacinta Nadarajan, Rui Tao, and Ibrahim Shokry
Faculty Mentor: Rui Tao
Presenter: Alexandra To

Alzheimer's disease (AD) is a neurodegenerative disease generally attributed to the accumulation of amyloid beta plaques in the brain. Although amyloid beta is a normal neuronal product, AD patients have higher concentrations due to overproduction and insufficient clearance. The amyloid beta plaques, however, do not aggregate equally throughout the brain. Amyloid beta plaques are first found in the neocortex. With progressive accumulation, plaques spread hierarchically to regions of the brain directly receiving information from previously affected areas. Using the analysis tool 3D Slicer, we compared the volumes of the cerebellum–one of the last regions to amass amyloid beta plaques despite having the highest neuronal concentration–in MRI scans of AD and cognitively unimpaired (CU) individuals. AD patients were found to have lower cerebellar volumes, indicating atrophy. The extent of atrophy can be further investigated in different brain regions to help quantify variable effectiveness of clearance pathways and neurodegenerative progression.

Health & Medical Sciences

35 The Relationship Between Physical Activity, Physical Function, and Quality of Life in Breast Cancer Survivors

By: Lia Hofman, Lynn Panton, and Ashley Artese
Faculty Mentor: Ashley Artese
Presenter: Lia Hofman

Breast cancer survivors (BCS) experience treatment–related losses in physical function (PF) and quality of life (QOL). Although physical activity (PA) improves recovery, research is needed to examine the relationship between post–treatment PA and both PF and QOL. We investigated the relationship between PA, PF, and QOL in BCS. Forty–four BCS (60±8 years) wore a FitBit to measure PA (steps/day) and completed the Continuous Scale–Physical Functional Performance (CS–PFP) Test and Functional Assessment of Cancer Therapy–Breast (FACT–B) questionnaire to assess PF and QOL, respectively. Relationships were determined using partial correlations. Steps/day were associated with total CS–PFP score ($r=.32$; $p=.050$) and domains for balance ($r=.32$; $p=.046$) and endurance ($r=.35$; $p=.030$), but not strength or flexibility. Steps/day and FACT–B domains were not related, except for the Breast Cancer Subscale ($r=.33$; $p=.041$). BCS with higher PA had better PF and lower reported cancer–related symptoms, thus highlighting the importance of PA in survivorship care.

Health & Medical Sciences

36 The Relationship Between Appendicular Skeletal Muscle Index and Sit to Stand Muscle Power

By: Maguire Lindisch, Addy Goguen, Lynn Panton, and Ashley Artese
Faculty Mentor: Ashley Artese
Presenter: Maguire Lindisch

Breast cancer survivors (BCS) are at risk for treatment-related losses in muscle. Appendicular Skeletal Muscle Index (ASMI) is an indicator of limb muscle mass and is used to identify sarcopenia. A sit-to-stand (STS) muscle power test may be a non-invasive way to predict ASMI in BCS; there is limited research on the relationship between ASMI and STS power. We investigated the association between ASMI and STS muscle power. ASMI was calculated in forty-four BCS (60±8 years) and they completed a STS muscle power test with the Tendo Power Analyzer. Pearson product-moment correlations were used to examine the association between ASMI and STS scores. ASMI was significantly associated with average ($r=.53$; $p<.001$) and peak ($r=.58$; $p<.001$) power on the STS. The STS muscle power test may be a valuable tool to predict ASMI in BCS. More research with a larger sample size is needed to confirm results.

Environmental, Ecological & Marine Sciences

37 Spatiotemporal Distribution on Microplastic Composition in Coastal Sediment

By: Hafsah Bashir, Kayla Mosteller, Halaina Hahn, and Tiffany Roberts Briggs
Faculty Mentor: Tiffany Roberts Briggs
Presenters: Hafsah Bashir and Kayla Mosteller

Microplastic pollution, a worldwide concern, is causing health issues in species through ingestion and inhalation. We will explore the relationship between grain size (granulometry) and microplastic composition by testing microplastic polymers in coastal sediment. This aims to improve our understanding of microplastic pollutants in coastal ecosystems. Microplastics from sediment samples collected at three South Florida beaches during the winter and summer are analyzed under a stereomicroscope to determine type, size, and color, then analyzed through Fourier transform infrared (FTIR) spectroscopy. We anticipate the FTIR will accurately identify chemical composition by comparing infrared spectra to known plastic frequencies, enabling analysis and source tracing of microscopic plastic particles. We hypothesize that greater polymer and microplastic variation will occur in the winter samples due to high-energy wave dynamics, reflecting differences in transportation and granulometry.

SESSION 1 POSTER PRESENTATIONS 9:00 am to 10:00 am

Health & Medical Sciences

38 Validating Wearable Sensors for Tracking Head and Neck Motion: Advancing Rehabilitation and Biomechanics

By: Samkit Bothra, Vibhor Agrawal, and Abhijit Pandya
Faculty Mentor: Vibhor Agrawal
Presenter: Samkit Bothra

Medical conditions, such as Parkinson's disease, spondylitis etc. restrict the movements of the head and neck. Accurately measuring head and neck movements is essential for the patient's rehabilitation and biomechanical research. While gold-standard motion capture systems, such as the Optotrak, provide highly precise kinematic data, they are often expensive and impractical for tracking head and neck motion in the clinic. This study evaluates the accuracy of wearable Inertial Measurement Unit (IMU) sensors by comparing its measurements to those obtained from the Optotrak system. The goal is to assess the validity of the IMU's motion tracking capabilities for rehabilitation and biomechanical applications. Study findings will guide further sensor calibration and algorithm refinement to enhance measurement accuracy. This research contributes to the development of affordable and portable alternatives for monitoring head and neck mobility in clinical settings.

Classroom Research Project/Assignment

39 Evaluation of Reproductive Seasons of Gopher Tortoises (*Gopherus polyphemus*) in Southeastern Florida versus Southwestern Georgia Populations

By: Bella Moon, Martha Torres, Lauren Gapczynski, Evelyn Frazier
Faculty Mentors: Evelyn Frazier and Lauren Gapczynski
Presenter: Isabella Moon

Gopher tortoises (*Gopherus polyphemus*) are a keystone species that span from Louisiana to southern Florida. Past literature states that populations in southeastern Florida have shown reproductive behavior outside of their typical reproductive seasons. It is believed this is due to the increased temperatures and rainfall. Larger tortoises and clutch sizes have also been observed, which have been shown to correlate to earlier sexual maturity and reproductive success. In this study, gopher tortoise reproductive success in southwestern Georgia populations and southeastern Florida populations will be measured and compared to provide a better idea of how weather patterns can impact reproductive success including times of year they are mating and laying eggs, as well as how many eggs they are laying and how big the tortoises are in the two habitats. Without this species, ecosystems would essentially collapse, so understanding behavior of the tortoises is necessary to understand the ecosystem around them.

2:00 pm to 3:00 pm POSTER PRESENTATIONS SESSION 2

Environmental, Ecological & Marine Sciences

1 Documenting Vocal Development in Juvenile Bachman's Sparrows (*Peucaea aestivalis*)

By: Michelle Paixao, Jocelyn Goodwin, Jonah Cohen, Louna Alkurdi, Luke-Ezra Berg, May Abiri, Shanice Eduh-Duncan, Tatiana McFarlane, Yassa Raphael, Heather Wolverton, and Rindy Anderson
Faculty Mentor: Rindy Anderson
Presenters: Michelle Paixao, May Abiri, Louna Alkurdi, Luke-Ezra Berg, Jonah Cohen, Shanice Eduh-Duncan, Jocelyn Goodwin, Tatiana McFarlane, and Yassa Raphael

Vocal learning is exceptionally rare in animals. Vocal learning in young songbirds follows the same developmental stages as language acquisition in human infants and involves recognizing and repeating conspecific songs. We studied vocal development in Bachman's sparrow, a species with an unusually large vocal repertoire. We collected wild Bachman's sparrows as nestlings and reared them in the laboratory. The young birds were exposed daily to song playbacks during which time we recorded their vocal responses. We asked if young birds are more likely to call in response to Bachman's sparrow songs versus other species, and determined the ages at which males undergo three major stages of vocal development. Our study will broaden existing knowledge about song learning in songbirds and how song recognition early in life may guide the vocal learning process.

Basic Sciences

2 The Neuroscience Basis of Placebo Analgesia: Its Origins and Impacts

By: Caden Watts and Gary Perry
Faculty Mentor: Gary Perry
Presenter: Caden Watts

Placebo analgesia occurs when an inert treatment induces genuine pain relief through psychological and neurobiological mechanisms. Expectations, social cues, and conditioning activate pain modulation pathways, with greater analgesia in individuals with positive expectations. Here we present published research from the literature on imaging studies that highlight the anterior cingulate cortex (ACC) as central to placebo analgesia, coordinating with the periaqueductal gray (PAG) to inhibit nociception. The projecting PAG-RVM system releases endogenous opioids, blocking pain signals at the spinal level, a process reversed by opioid antagonists like naloxone. Beyond this, emerging evidence suggests the endocannabinoid system also plays a role, particularly in NSAID-conditioned analgesia. The amygdala, involved in emotional processing, may modulate both sensory and affective pain components. These findings underscore the complexity of placebo analgesia, where psychological and neurobiological mechanisms interact to shape pain perception. Understanding these processes could inform non-pharmacological pain management strategies, emphasizing a holistic approach to treatment.

SESSION 2 POSTER PRESENTATIONS 2:00 pm to 3:00 pm

Behavioral, Educational & Social Sciences

3 Visual Examination of Own– and Other–Race Faces and Implicit Racial Bias in Children and Adults

By: Zarah Naveed and Gizelle Anzures
Faculty Mentor: Gizelle Anzures
Presenter: Zarah Naveed

This study explores how implicit racial biases influence visual scanning of own– and other–race faces in both adults and children. Previous research has shown inconsistent results, with limited focus on factors like implicit racial bias. This research aims to examine how these biases affect the duration of looking at different facial features of White and Asian faces. Participants, including adults and children, complete recognition tasks and the Implicit Association Test (IAT) while eye–tracking data is collected. We predict that children with higher implicit biases will focus longer on their own–race facial features and avoid other–race features, particularly the eyes. Analyzing these patterns of visual attention could reveal the social–cognitive processes influencing racial perceptions and interactions. The findings may contribute to understanding how implicit biases shape social dynamics and intergroup relations, providing insights into early development of racial biases and their impact on social behavior.

Classroom Research Project/Assignment

4 The Blackest of Crimes: Interrogating Familial Murderers in Early Modern England

By: Christian Robinson
Faculty Mentor: Ben Lowe
Presenter: Christian Robinson

Ordinaries or prison priests were responsible for the spiritual welfare of prisoners housed in Newgate prison in early modern England. An Ordinary's duties included facilitating a series of conversations with prisoners designed to elicit confessions of criminal wrongdoing in exchange for assurances of salvation following their execution. A close reading of published accounts written by Ordinaries reveals that these interrogations were prolonged in cases of familial murders. This presentation uses recent historiographic methodologies in conjunction with accounts written by Ordinaries to argue that Ordinaries exploited the spiritual concerns of familial murderers to publish accounts that underscored the importance of family life as the nucleus of society in early modern England. Moreover, this formed a pattern in which the Ordinary appears to express concern for victims of familial murderers while simultaneously using the victim as a vehicle to elicit confessions and reinforce familial norms.

Classroom Research Project/Assignment

5 Exploring the Response of Mothers of a Child Undergoing BMT Throughout Transitions of Care

By: Erin McBroom and Katherine Heinze
Faculty Mentor: Katherine Heinze
Presenter: Erin McBroom

Pediatric Blood and Marrow Transplantation (BMT) is a critical treatment for life-threatening illnesses, demanding extended caregiving from parents, primarily mothers, who often face significant emotional, financial, and physical challenges. The purpose of this study is to explore how mothers respond throughout their child's BMT journey, concentrating on the transitions between acute and chronic phases of care. Eleven mothers of children undergoing BMT participated in qualitative interviews, and data was analyzed using Max Van Mannen's phenomenological approach. Five major themes emerged including (1) impact on family dynamics, (2) reliance on external support, (3) coping mechanisms and adaptation, (4) personal sacrifice, and (5) emotional strain and isolation. Findings show that mothers utilize diverse coping strategies. The study concludes that understanding caregivers' experiences can advise healthcare providers in developing personalized, family-centered care practices, supporting caregivers' well-being and, subsequently, improving patient and family outcomes during and after BMT treatment.

Health & Medical Sciences

6 Differentiate Cancer Cells by Analyzing Their Molecular Oscillations From Their Raman Spectroscopy Data and Machine Learning Based Skin Cancer Predictive Model

By: Phuong Nguyen, Andrew Terentis, and Max Mccain
Faculty Mentor: Andrew Terentis
Presenter: Phuong Nguyen

Skin cancer is one of the most common forms of cancer, so finding an accurate, fast, and effective diagnostic method is a promising topic, especially for non-melanoma skin cancers such as squamous cell carcinoma (SCC) and basal cell carcinoma (BCC). Raman Spectroscopy (RS) detects vibrational modes of biomolecules such as proteins, lipids, and nucleic acids, allowing machine learning to differentiate normal and cancerous skin tissues. Skin tissue samples were collected from Dr. Strasswimmer's dermatology clinic and analyzed using RS in Dr. Terentis's lab. The collected spectra underwent processing: baseline correction, normalization, and mean centering, followed by Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA) for classification. Therefore, the research project aimed to evaluate the feasibility of RS in distinguishing SCC from BCC and its potential application for melanoma detection, a machine learning diagnostic model assessed to provide a rapid, non-invasive alternative and improve the ability to detect early cancer.

SESSION 2

POSTER PRESENTATIONS

2:00 pm to 3:00 pm

Environmental, Ecological & Marine Sciences

7 The Microbial Community of *Dicerandra frutescens*

By: Romi Levin and Angela Mason
Faculty Mentor: Vanessa Fernandes
Presenters: Romi Levin and Angela Mason

Dicerandra frutescens is an endemic Florida scrub mint threatened by habitat fragmentation and environmental changes. In many studies, it has been proven that symbiotic relationships between plants and microbes have amplified plant growth and persistence. Our study identifies beneficial bacteria in the scrub mint's microbial communities in hopes of contributing to future conservation efforts. Our results showed that the rhizosphere and bulk soil of the scrub mint hosted a richer and more diverse set of bacteria, including microbes that provide more nutrient availability and defense against harmful microbes. Leaf samples were less diverse, with notable genera like *Methylobacterium* that support growth through hormone production. These results show how microbiomes support the scrub mint's growth, and they point to the potential of being conservation tool.

Environmental, Ecological & Marine Sciences

8 Fire History and Soil Microbial Communities in Florida Xeric Shrubland

By: Ryan Merard
Faculty Mentor: Vanessa Fernandes
Presenter: Ryan Merard

While many studies investigate the effects of wildfires and prescribed burns on microbial communities, less is known about how fire history influences biocrust diversity and function in xeric shrublands. This study explores microbial community variations in a Florida xeric shrubland with different burn histories, comparing recently burned areas to those unburned for 10–20 years. We collected samples from four sites at Archbold Biological Station, each representing a distinct fire interval (2–6 years and 10–19 years). Biocrusts were analyzed for microbial composition using 16S rRNA gene sequencing, while soil properties, including organic carbon and total nitrogen, were quantified. Microbial diversity metrics were assessed using EPI2ME sequencing and PERMANOVA. Statistical analysis showed no significant differences in bacterial communities across fire histories, suggesting rapid microbial recovery. This may indicate that prescribed fires leave minimal long–term effects on microbial communities in xeric shrublands.

Health & Medical Sciences

9 A Preliminary Exploration of Nursing Students' Knowledge of Current Florida Health Policies Impacting Nursing Practice

By: Sydney Gibbons and Louise Aurélien Buie
Faculty Mentor: Louise Aurélien Buie
Presenter: Sydney Gibbons

Nursing practice in Florida is guided by the Nurse Practice Act (Chapter 464 Florida Statutes), which is continuously updated through legislative action. The latest health policies impacting nursing practice are published on the Florida Board of Nursing website (www.doh.state.fl.us/mqa). The Institute of Medicine's 2010 Future of Nursing Report highlights that nurses are underrepresented and disengaged in health-policy decision-making, a situation that remains unchanged in 2024. As healthcare evolves, it is crucial to evaluate how well-prepared future nursing professionals are to engage in policy development. This project assesses nursing students' awareness and knowledge of Florida's health policies. Online surveys were distributed to undergraduate and graduate nursing students at Florida Atlantic University's Christine E. Lynn College of Nursing. Initial data analysis is underway, with data collection extending to Fall 2024. We aim to identify knowledge gaps, enhance curricula, boost students' interest in policy advocacy, and better prepare them for the workforce.

Health & Medical Sciences

10 Transcriptome Analysis Reveals a Novel Role for Endothelial c-Myc in Sepsis-Induced Cardiomyopathy

By: Koye Guan, Aline G. Santana, Frantzia M. Jeanty, Alejo A. Morales, and Claudia O. Rodrigues
Faculty Mentors: Claudia Rodrigues and Aline Santana
Presenter: Koye Guan

Sepsis-induced cardiomyopathy can lead to long-term cardiac dysfunction. Previous studies from our group have shown that endothelial c-Myc is an essential regulator of inflammation and tissue homeostasis. In the present work, we investigated the relevance of endothelial c-Myc in sepsis-induced cardiac inflammation and dysfunction by transcriptome analysis. We used two mouse models where c-Myc expression was deleted (KO) or overexpressed (OE) in endothelial cells. Animals were exposed to lipopolysaccharide (LPS) or vehicle control (PBS) and hearts collected after four hours for RNA-sequencing analysis. Results showed compensatory increase in mitochondrial function genes in both KO and OE relative to control (CT). KO hearts displayed signs of exacerbated dysfunction, characterized by disruption of fatty acid metabolism relative to CT. OE hearts showed downregulation of genes associated with cellular repair mechanisms, including fibroblasts and natural killer cells, suggesting reduced injury. Our findings suggest an important role for endothelial c-Myc in sepsis-induced cardiac dysfunction.

SESSION 2 POSTER PRESENTATIONS 2:00 pm to 3:00 pm

Behavioral, Educational & Social Sciences

11 Power, Politics, and Technology in a Pediatric Clinic: An Ethnographic Study

By: Shyla Adhikari
Faculty Mentor: Katharina Rynkiewich
Presenter: Shyla Adhikari

This ethnographic study supported by the FAU Ethnography Lab examines the role of power dynamics, political influences, and technology in pediatric clinics, with a focus on patient–physician interactions. Through long–term direct observation of physicians (N=1) and advanced practice registered nurses (N=2) at a pediatric clinic in Palm Beach County, we found that pediatricians navigate medical decision–making between the child's best interests and parental authority. Political factors (e.g., recent changes in immigration enforcement and the growing demand for weight–loss medications like Ozempic) and sensitive topics in the care of minors (e.g., sexual health, HIV testing, and reproductive care) further complicate medical practice. Additionally, technology such as artificial intelligence translation and scribing has changed patient–provider interactions, upholding barriers for those who are not familiar with the platform. These findings contribute to discussions on healthcare equity, policy reform, and the evolving role of technology in pediatric medicine.

Business, Marketing, Finance & Public Administration

12 The Impact of Prestige on Hospitality and Tourism

By: Soyoung Park, Jeilyn Sevilla Nunez, and Bryan Caldeira
Faculty Mentor: Soyoung Park
Presenters: Jeilyn Sevilla Nunez and Bryan Caldeira

The hospitality field has always had a negative stigma surrounding it due to the low wages, low skill, sexual harassment, lack of benefits, and low job retention. Because of this, we designed a study to identify how occupational prestige is determined in the hospitality and tourism setting. By conducting interviews, surveys, and data analytics from social media/ online forums, we will collect data to answer our research question. We expect to see a trend in how the reasons stated above play a role in the prestige associated with the hospitality and tourism setting. The more stigma the hospitality field receives, the fewer people will want to join the field. This could have a negative effect not only on your personal life but also on the world economy because of how much hospitality affects the global economy.

Behavioral, Educational & Social Sciences

13 Examining Human Perceptions of AI Consciousness and Intentionality

By: Alexandra Hickey and Michael Maniaci
Faculty Mentor: Michael Maniaci
Presenter: Alexandra Hickey

As artificial intelligence (AI) becomes increasingly a part of daily life, it is essential to understand how humans experience and ascribe human-like qualities to AI. To what extent people anthropomorphize AI will be examined in this research through their attributions of intentionality, free will, emotions, consciousness, and autonomy to AI. Participants will first report about themselves through self-report measures of attitudes and beliefs. They will then complete a brief social interaction with an AI chatbot and then answer questions that are particular to their experience and impression of the AI. Through feedback from participants, this study will investigate how social interaction with AI is related to the tendency to consider AI as having human-like attributes. Outcomes may present certain psychological mechanisms that contribute to AI anthropomorphism and help in designing more successful human-AI interaction.

Behavioral, Educational & Social Sciences

14 Masculinity, Personality, and Public Policy

By: Jordan Thompson, Rylie Patterson and Geoffrey Wetherell
Faculty Mentors: Geoffrey Wetherell and Jordan Thompson
Presenter: Rylie Patterson

Many recent public policies have focused on gender, but the impacts of such policies are typically examined from women's perspectives, while men's perspectives are largely understudied. To bridge this gap, we will administer a survey on CloudConnect to male participants. Participants will respond to the Conformity to Masculine Norms Inventory, the Gender Role Discrepancy Stress scale, precarious manhood items, personality items, and gender-related public policy items. We will run regression analyses where the masculinity items predict public policy support, and analyses where personality items predict public policy support. We expect that men higher in Conformity to Masculine Norms will have higher support for hierarchical gender-related policies. Additionally, we expect that men higher in precarious manhood and Gender Role Discrepancy Stress will have higher support for aggressive gender-related policies. Further, we expect that different personality traits will differentially predict support for hierarchical and gender-related public policies. Implications will be discussed.

SESSION 2 POSTER PRESENTATIONS 2:00 pm to 3:00 pm

Classroom Research Project/Assignment

15 The Effects of Iron Deficiency Anemia on Basic Military Training in Females in the Military

By: Hannah Sherman and Candy Wilson
Faculty Mentor: Candy Wilson
Presenter: Hannah Sherman

Iron deficiency anemia (IDA) as a gender–difference topic is underappreciated for its role in physical performance, particularly for women in the military. The purpose of this study was to assess the effects of iron deficiency anemia on basic military training (BMT) health and fitness outcomes (n=640). A quantitative secondary data analysis was conducted on a parent study to identify the effects of IDA on training and health outcomes in military women during BMT. The findings of this study were that women with IDA had a 19.7% (n=63) rate of not graduating versus women without IDA had only 4.1% (n=13). IDA women had a longer mean run time of 854.73 seconds (p=<.001) than women without IDA. IDA can cause discharges from service and delayed graduation rates due to physical consequences. This study suggests that military women prevent anemia–related health risks and performance issues.

Cross Disciplinary Projects

17 Florida Public Archaeology Network Field School Results For Field Season 2025

By: Kaiden Merchant, Mia Widdis, Giancarlo Mazzetti, Katharine Napora, Sara Ayers–Rigsby, Victoria Piotrowski, Alanna Lecher, Peter De Witt, and John Sullivan
Faculty Mentors: Katherine Napora and Sara Ayers–Rigsby
Presenters: Kaiden Merchant, Mia Widdis, and Giancarlo Mazzetti

Here, we discuss the ongoing research program undertaken by and the public outreach being conducted during the third field season of the Shining a Light on the Past Archaeological Field School, run by the Florida Public Archaeology Network in Partnership with the Bureau of Land Management, Florida Atlantic University, and Lynn University at the Jupiter Inlet Lighthouse Outstanding Natural Area (ONA) in Jupiter, Florida. Our work is focused on employing survey, excavation, and heritage science methods to elucidate the extent of the Native American town, 19th century lighthouse keepers' structures, and WWI and WWII components of the site and disseminating these findings widely to the general public.

Engineering

18 Monocular 3D Human Pose Estimation for Gait Analysis

By: Jossaya Camille, Hunter Lauritano, and Behnaz Ghoraani
Faculty Mentor: Behnaz Ghoraani
Presenters: Jossaya Camille and Hunter Lauritano

Gait analysis methods to diagnose cognitive disorders have varied widely in methods of data collection and analysis. However, these methods often have high costs or require a gait lab, reducing their accessibility. We propose a new way to perform gait analysis through 3D human pose estimation (HPE) with a single camera, offering an efficient and cost-effective approach for extracting key gait parameters. Unlike traditional methods requiring specialized sensors, this approach uses a single phone camera and Mediapipe BlazePose for pose estimation. Camera calibration and coordinate conversion using Zhang's method (2000) were employed to ensure accurate spatiotemporal data analysis. Preliminary results indicate that extracted gait measures align with reference ranges for healthy individuals, demonstrating the method's viability for clinical applications. By reducing the cost and complexity of gait analysis, this work sets the foundation for using accessible tools to predict cognitive disorders from gait.

Engineering

20 Low-Rank Matrix Factorization for Video Analysis

By: Cristian Pena, Xiaopeng Li, and Cedric Josz
Faculty Mentor: Xiaopeng Li
Presenter: Cristian Pena

This study applies low-rank matrix factorization to separate a video into a static background and moving objects by approximating each frame as a rank-one matrix plus noise. The rank-one matrix represents the background, as static elements remain consistent across frames, while the noise term captures deviations corresponding to moving objects. Stochastic Gradient Descent is an iterative optimization method used to refine the decomposition by incrementally adjusting estimates. To refine this decomposition, we compare two loss functions: the L2 norm, which minimizes squared differences, and the L1 norm, which minimizes absolute differences. Results tested on real and synthetic videos show that the L1 norm is approximately 2.31 times more accurate and converges nearly half the time. These findings demonstrate that the L1 formulation improves accuracy and efficiency, making it more practical for real-time video processing.

SESSION 2 POSTER PRESENTATIONS 2:00 pm to 3:00 pm

Engineering

21 Evaluating Heat Pipe Performance in an Adaptive Cooling System for Lower-Limb Prosthetics

By: Jacob Askins and Haley Durso
Faculty Mentor: Oscar Curet
Presenters: Jacob Askins and Haley Durso

Lower-limb prosthetic users often experience discomfort due to heat and perspiration buildup, this leads to skin irritation, poor fit, and reduced mobility for users. While prosthetic designs traditionally prioritize structural integrity and mobility, thermal regulation remains an overlooked challenge for engineers. This project addresses the issue by developing a prosthetic cooling system that integrates convective cooling using heat pipes with passive moisture management. The system aims to reduce skin temperature by 5°C compared to traditional systems, using embedded sensors for real time temperature monitoring and activating cooling only when necessary to optimize energy usage. Testing will involve a dragon skin mold of a residual limb with an embedded heated bath to simulate internal temperature. This setup allows for recreating various conditions to refine the system's performance. By improving thermal regulation and reducing discomfort, this project aims to enhance mobility, prosthetic fit, and overall quality of life for lower-limb amputees.

Environmental, Ecological & Marine Sciences

22 Evaluating Camera Trap Effectiveness in Capturing Social Interactions of Red-Tailed Monkeys (*Cercopithecus ascanius*)

By: Keyante Wheatley, Valentina Leal-Monro, and Kate Detwiler
Faculty Mentor: Kate Detwiler
Presenters: Keyante Wheatley and Valentina Leal-Monroy

Camera trap studies are valuable tools for animal ecology and behavior research, yet their effectiveness in capturing social interactions may be limited. Here, we investigated the usefulness of camera traps deployed for an occupancy survey to document red-tailed monkey (*Cercopithecus ascanius*) social interactions across three forest layers in Lomami National Park, Democratic Republic of Congo. Using 443 videos from 2021, we analyzed affiliative, agonistic, and movement behaviors. Videos of single individuals were excluded to focus on interactions between two or more monkeys. As expected from an arboreal species, all interactions occurred in the understory and canopy. While camera traps captured diverse social behaviors, their effectiveness was limited by field of view, species-specific movement patterns, and survey design. Future research targeting social behavior should optimize camera trap placements for a larger field of view, such as pairing cameras, allowing for a more comprehensive understanding of red-tailed monkey social dynamics.

Environmental, Ecological & Marine Sciences

23 Survey of Duiker Diversity and Abundance in Lomami National Park

By: Rachel Prat, Daniel Gorczynski, and Kate Detwiler
Faculty Mentor: Kate Detwiler
Presenter: Rachel Prat

The Congo Basin harbors immense biodiversity yet remains among the least explored tropical regions. In recent years, conservation efforts have amplified with the creation of Lomami National Park. Outside of the protected area, designated buffer zones allow local communities to hunt for bushmeat, including Duikers. These small antelopes play a vital role as seed dispersers in the region and are increasingly threatened due to hunting pressure. Using bycatch data from the camera traps deployed by the FAU primatology team, we explored how three survey sites within the Lomami ecosystem differ in Duiker diversity and abundance than the site within the hunting buffer zone. Our results indicate that the protected sites had higher duiker richness and abundance than the site within the hunting buffer zones. Further analysis of this region can help ensure the protection of these ecologically significant species, while supporting local communities' access to essential food resources.

Environmental, Ecological & Marine Sciences

24 Analyzing Sediment and Hatching Success in Leatherback Sea Turtle Nests

By: Kayla Mosteller, Elizabeth Schultheis, Samantha Kuschke, and Tiffany Roberts Briggs
Faculty Mentors: Tiffany Roberts Briggs and Samantha Kuschke
Presenter: Kayla Mosteller

Sea turtle nesting spans 30 miles of coastline in South Florida. Within these areas, many factors contribute to hatching success, including incubation temperature, sediment composition, gas exchange, and microbial influences. Leatherback sea turtles are particularly vulnerable to these factors and routinely have the lowest global hatching success rate of all sea turtle species at roughly 50%. This work investigated the relationship between sediment composition at oviposition and hatching success in leatherback nests in southeast Florida. Nest sediment factors such as composition, sorting, and color can alter moisture retention, temperature, and microbial growth and ultimately impact hatching success. However, we found no significant relationships between mean grain size, sediment sorting, or sediment color and hatching success in leatherback nests. This suggests that sand composition alone is not correlated with decreased hatching success and additional investigations into the low hatching success seen in leatherbacks around the globe is necessary.

SESSION 2 POSTER PRESENTATIONS 2:00 pm to 3:00 pm

Environmental, Ecological & Marine Sciences

25 Vertebral Biomechanics of *Isurus oxyrinchus*, the Shortfin Mako

By: Madisan Biordi, Isabella Fernandez, Genna Felder, Aubrey Clark, and Marianne Porter
Faculty Mentor: Marianne Porter
Presenters: Madisan Biordi and Isabella Fernandez

Sharks swim using their caudal fin and body, and faster animals have stiffer bodies. Shark vertebral columns are cartilaginous, and are the main body axis contributing to whole body stiffness. The shortfin mako, *Isurus oxyrinchus*, is one of the fastest fish in the ocean. We examine the mechanical properties of vertebrae by quantifying stiffness (ability to resist compression) and toughness (ability to absorb energy) among young of the year, juvenile, and adult *I. oxyrinchus* along the body. We hypothesized that adult sharks would have stiffer and tougher vertebrae because they have more mineralized structures within the cartilage compared to younger sharks. Also, we thought that stiffness and toughness would increase in vertebrae posteriorly because that is where the forces to generate swimming would be the largest. Contrary to our hypothesis, we found stiffness and toughness decreased as sharks matured, and that posterior vertebrae were tougher and stiffer than anterior vertebrae.

Environmental, Ecological & Marine Sciences

26 The Effect of Schooling on Blacktip Shark Swimming Kinematics

By: Hanna Carberry-Simmering, Darien R. Satterfield, Brynne Alcorta Ordonez, Delaini Majetic, Isabella Urban, Selena Weathers, Ashkaan Fahimipour, and Marianne Porter
Faculty Mentors: Marianne Porter and Darien Satterfield
Presenter: Hanna Carberry-Simmering

The major benefit of schooling behavior in fish includes reduced energetic costs of locomotion, but measuring these benefits is still logistically challenging for large animal groups in the wild. We aim to evaluate the effects of schooling on the swimming kinematics of Blacktip sharks (*Carcharhinus limbatus*), using in situ video collected via drone. We supplied hand-annotated data to an AI- and computer vision-based pose estimation model to track swimming patterns in time. We will measure tailbeat frequency to estimate the relative energetic costs of swimming in schools versus in isolation. Additionally, we will record distances between neighbors to address the hypothesis that correlations in tail beats decline with neighbor distance. This study provides a baseline for how swimming kinematics may change with declines in population size, leading to smaller schooling groups or increased isolation.

Environmental, Ecological & Marine Sciences

27 Investigating Mitochondrial Genetic Diversity of The Red-Tailed Monkey, *Cercopithecus ascanius*, in Africa's Congo Basin Rainforests

By: Sarah Johnson, Michaela Howell, Vitor Dutra, and Kate Detwiler
Faculty Mentor: Kate Detwiler
Presenters: Sarah Johnson and Michaela Howell

Cercopithecus ascanius is an African primate species, with genetically diverse subspecies, found in rainforests of Central and East Africa. The objective of this study was to better understand the genetic structure within the Cercopithecus ascanius lineage. This project analyzed mitochondrial DNA (mtDNA) from five *Cercopithecus ascanius* katangae samples in the Lomami National Park region of the Democratic Republic of Congo. We used the cytochrome b gene as a molecular marker to identify patterns of genetic variation within the species. We successfully amplified the cyt b gene in all 5 samples and combined the new DNA sequence results with previous DNA sequences generated in our lab and from published studies. Preliminary results indicate a minimum of 14 haplotypes exist in the *C. ascanius* dataset. We report additional measures of genetic diversity for the species and highlight the importance of conservation efforts focused on maintaining this genetic diversity across the species' range.

Environmental, Ecological & Marine Sciences

28 Geomorphic Changes at Peanut Island in the Vicinity of Breakwaters

By: Holyn Hahn, Dayana Castillo, Tiffany Roberts Briggs
Faculty Mentors: Tiffany Roberts Briggs and Dayana Castillo
Presenter: Holyn Hahn

Several emergent breakwaters near Peanut Island in the Lake Worth Lagoon of Palm Beach County are designed to stabilize the shoreline. However, little is known about the sedimentology of the environments in the vicinity of the breakwaters. This project aims to assess the movement of sediment on the shoreline and how tidal movements are impacting accumulation or erosion. Monthly sediment sample collection at the swash zone at eleven transects will be conducted in addition to collection of topography. Analysis of the data collected will determine the changes to mean grain size through (granulometry) and shoreline evolution through RTK-GPS. We predict there is an imbalance in tidal flushing which is causing finer sediments to accumulate. This project analysis will provide insight whether the shoreline stabilization structures are also influencing sedimentology at the shoreline.

SESSION 2 POSTER PRESENTATIONS 2:00 pm to 3:00 pm

Health & Medical Sciences

29 Targeted Cancer Therapy: Immunonanotherapy With Hollow MnO_2 Nanoparticles

By: Holly Arrison
Faculty Mentor: James Hartmann
Presenter: Holly Arrison

With growing incidence rates each year, cancer continues to rank among the world's leading causes of death. Traditional cancer treatments often come with significant drawbacks that can severely impact patients' quality of life. This research investigates the efficacy of manganese dioxide (MnO_2) hollow nanoparticles when coated with anti-CD47 antibodies. By loading hollow MnO_2 nanoparticles with antibodies, we can effectively target and disrupt the "don't eat me" signal on cancer cells, initiating an immune response to destroy these cells. The nanoparticles are tested on healthy (esophageal epithelial cells) and cancerous cell lines (esophageal squamous cell carcinoma, KYSE30), assessing their targeting efficiency and ability to activate macrophages and the complementary immune system, promoting the "eat me" signal of cancer cells. The significance of this study lies in its potential to improve immune recognition and destruction of cancer cells, leading to more effective and less toxic cancer treatments and significantly improving patient outcomes.

Environmental, Ecological & Marine Sciences

30 Comparison of Corticosterone Levels Across Three Species of Sea Turtles

By: Caylee Lia, Heather Seaman, Sarah Milton
Faculty Mentors: Sarah Milton and Heather Seaman
Presenter: Caylee Lia

The progression of climate change poses a threat to endangered sea turtle species; leatherback (*Dermochelys coriacea*), green (*Chelonia mydas*), and loggerhead (*Caretta caretta*). Given that sea turtles are reliant on the beach composition and microclimate for their nest success, it is vital to inquire further about the physiological effects that climate change is having. An increase in temperatures brings attention to investigate the potential connection between rising temperatures and corticosterone levels in hatchlings. Corticosterone is the main stress hormone in reptiles and past research has drawn a connection between corticosterone level release and temperature. While high levels of corticosterone hormone are needed for the emergence period as well as the frenzy after emergence, the long-term physiological effects of sustained elevated levels are unknown. This study honed in on understanding if there was a connection between high incubation temperatures and high levels of corticosterone.

Environmental, Ecological & Marine Sciences

31 Flex and Flow: Vertebral Morphology of Bottlenose Dolphins

By: Jamie Knaub
Faculty Mentor: Marianne Porter
Presenter: Janeisy Davila

Bottlenose dolphins (*Tursiops* spp.) are extremely diverse and distributed worldwide. Coastal (*T. erebennus*) and offshore forms (*T. truncatus*) occupy neighboring habitats, but display differences in behavior, coloration, and morphology. Previous work has analyzed their skull morphology, but less is known regarding variation in the vertebral column. We explored vertebral anatomy between offshore and coastal bottlenose dolphins, focusing on thoracic, lumbar, and caudal regions. We hypothesized that coastal dolphin vertebrae would be less robust, providing maneuverability for swimming in complex nearshore environments. Using micro–CT scans and photographs, we measured vertebral shape (height, width, and length) and internal bone microstructure. We found that coastal dolphins had shorter vertebrae and a lower bone volume fraction (ratio of bone to vertebral body volume) than offshore dolphins. These findings support the differentiation between offshore and coastal dolphins and suggest the importance of vertebral adaptations to the diversification of bottlenose populations.

Environmental, Ecological & Marine Sciences

32 Isolation and Preservation of *Pseudomonas* From Environmental Soil Samples

By: Regan Bell
Faculty Mentors: Nwadiuto Esiobu Sirisha Madem
Presenter: Regan Bell

Microbiomes play an essential role in soil and plant health. Exposure to a diverse variety of microbes can provide plants with protection against certain pathogens, make nutrients more readily available, and promote overall growth. Given their importance, it is pertinent to analyze and maintain a biorepository of native microbiomes to provide access to samples for future biochemical and genetic studies. In this study we focused on the isolation and characterization of *Pseudomonas* species from a Moringa tree. *Pseudomonas* has the ability to aid plants in disease control and in the uptake of nutrients. Rhizosphere, leaves, and bulk soil samples were prepared from 6–week–old plants. The samples were diluted and cultured on PIA agar, which is a selective media for *Pseudomonas* species. CFU calculations, morphological identification, biochemical tests, and gram–staining were used to further characterize the samples. Following morphological analysis and biochemical tests, the samples were preserved and stored in −80°C.

SESSION 2 POSTER PRESENTATIONS 2:00 pm to 3:00 pm

Environmental, Ecological & Marine Sciences

33 Investigating the Effects of Temperature and Moisture on Developmental Rate of Early-stage Embryos in Leatherback Sea Turtles (*Dermochelys coriacea*) Using White Spot Formation

By: Hannah Mauer
Faculty Mentors: Jeanette Wyneken and Emily Turla
Presenter: Hannah Mauer

Historically, white spot formation on the surface of reptilian eggshells has been associated with early embryonic development. Thus, examining the white spot is a non-lethal way to study some aspects of early development in sea turtle eggs. In 2023 and 2024, leatherback turtle (*Dermochelys coriacea*) eggs (n=570) were collected from freshly laid nests at risk of tidal inundation. Eggs were assigned to one of six incubation temperatures (27°C, 28°C, 29°C, 30°C, 31°C, or 32°C) and two moisture (5% or 9%) treatments. Eggs were photographed daily at 9:00 AM and 5:00 PM for the first 14 days of development to monitor the timing of initial white spot formation. Results of a generalized linear mixed model showed that temperature and moisture significantly affected the time to initial white spot formation. If white spot formation indicates developmental progress, then temperature and moisture affect early development in leatherback turtle eggs.

Environmental, Ecological & Marine Sciences

34 Behavioral Ecology of *Cercopithecus mitis* (Blue Monkey) in the Congo Basin Rainforest

By: Eimy Tejeda and Kate M Detwiler
Faculty Mentor: Kate Detwiler
Presenter: Eimy Tejeda

Understanding animal behavior is fundamental for exploring the complexities of wildlife dynamics and ecological interactions. This study investigated the behavioral ecology of *Cercopithecus mitis* (blue monkey) in Lomami National Park, Democratic Republic of the Congo. Using camera-trap footage totaling approximately 4.5 hours, an ethogram was employed to classify distinct behavioral categories and document both intraspecific and interspecific behaviors. Analysis revealed that solitary travel was the most frequently recorded behavior. Foraging and feeding behaviors were also prominent. Notably, interactions with other sympatric species were documented, suggesting complex ecological relationships and potential interspecies competition or beneficial interactions. Observations categorized as "out of view" underscore the inherent challenges of monitoring animal behavior in a dense rainforest canopy, where even optimal camera placement may not overcome natural obstructions. Although overall observation time was limited, these recordings provide critical baseline data that enhance our understanding of *C. mitis* and inform future long-term behavioral studies.

Environmental, Ecological & Marine Sciences

35 Exploring the Olfactory Sensory Epithelium of *Hydrolagus colliei*

By: Rivkah Kahn, Tricia Meredith, and Lauren Simonitis
Faculty Mentor: Lauren Simonitis
Presenter: Rivkah Kahn

Deep sea fishes, such as *Hydrolagus colliei*, use olfaction to detect chemical signals, allowing them to find food, partners, and safety. They do this using olfactory rosettes which consist of many lamellae with secondary folds to increase their surface area. Previously, secondary folding in the olfactory rosette has been quantified. This study aims to understand how specialized lamellar morphologies, such as tertiary folding, looping, and branching, further increase olfactory sensory surface area. *Hydrolagus colliei* (N=5) lamellae were imaged using scanning electron microscopy (SEM). Specialized lamellar morphologies were quantified and mapped onto the rosette to look for positional differences in lamellar microstructure. Additionally, patterns in lamellar morphology were compared between specimens for possible correlations between age and sex. Because *Hydrolagus colliei* are a distant evolutionary relative of sharks, understanding their olfactory structures gives us a further understanding not just of fish olfaction but to the evolutionary origins of vertebrate olfaction.

Health & Medical Sciences

36 Isolation, Characterization, and Screening of Polyphenols for Potential Anticancer Activity

By: Christian Whittington, Joubin Jebelli, James Hartmann, and Lyndon West
Faculty Mentors: Lyndon West and Joubin Jebelli
Presenter: Christian Whittington

This experiment concerns the isolation, characterization, and screening of polyphenols and other natural products for anticancer activity. Analysis of anticancer behavior provides insight into effective drugs regarding in vitro studies, as well as future applications concerning in vivo studies. Many naturally occurring compounds exhibit anticancer effects but face challenges such as poor bioavailability or biodegradation. This in vitro study emphasizes the screening of polyphenols and other natural compounds for anticancer effects and makes a comparison between natural activity and activity coupled with deep eutectic solvents for drug delivery. The results of this study will continue to establish natural products as an alternative therapeutic in cancer treatment.

SESSION 2 POSTER PRESENTATIONS 2:00 pm to 3:00 pm

Health & Medical Sciences

37 Effects of a Hands-On Dog Adoption and Training Program Compared to a Waitlist Control on Sleep Quality in Veterans with PTSD Symptoms

By: Macie Intoppa and Beth Pratt
Faculty Mentor: Beth Pratt
Presenter: Macie Intoppa

Veterans with posttraumatic stress disorder (PTSD) frequently experience difficulty sleeping, and conventional treatments show limited effectiveness. This study compared self-reported sleep quality among veterans with PTSD in a dog adoption and training intervention versus a waitlist control group (WLC). Forty-two veterans (78.6% male, 21.4% female) in South Florida were randomized into either the intervention (n = 18) or the WLC (n = 21) group. Self-reported sleep quality was quantified at three time points (baseline, post-intervention, four weeks later; or baseline, eight weeks, 12 weeks, respectively) using the Pittsburgh Sleep Quality Index (PSQI). Linear mixed model analysis did not reveal a statistically significant difference between groups (p = 0.220); however, the intervention group demonstrated a greater downtrend in scores compared to the WLC. Future research with a larger sample size is suggested to determine whether dog ownership is a significant non-pharmacological strategy for improving sleep quality in veterans with PTSD.

Health & Medical Sciences

38 Drug Intoxication-Related Mortality Among Older Adults With Combined Opioid and Cannabis Use

By: Christina DiMeo and Armiel Suriaga
Faculty Mentor: Armiel Suriaga
Presenter: Christina DiMeo

Drug overdose deaths (DOD) have been a significant public health problem in the U.S., causing over half a million deaths since 1999. While younger populations have been most affected, DOD among 65+ has risen sharply, from 1.8 per 100,000 in 1999 to 23.17 in 2021. Between 2022 and 2023, this trend increased in older adults, while other age groups saw declines. Opioids contributed significantly to this increase; however, the combined opioids and cannabis use in older adults is rarely reported. This cross-sectional study examined drug intoxication-related deaths (DIRM) among 65+, using data from the Florida Department of Law Enforcement (2020-2021), with 30,846 cases, including 3,640 older adults. Ninety-two used both opioids and cannabis. Results showed that 38% of older decedents who used both substances died from DIRM. The risk of death was higher for opioid users and lower for cannabis users, underscoring the need for tailored interventions for harm reduction.

Music, Art, Literature, Theater, History & Philosophy

39 Giulia Caruso Kanner and Her Creations at Talbert

By: Stella Potenti, Ida Pettener, and Ilaria Serra
Faculty Mentor: Ilaria Serra
Presenter: Stella Potenti

This research project focuses on the immigration journey of Giulia Caruso Kanner, who arrived in America after World War II as a war bride from Naples, Italy. Even through wartime adversity, Kanner's embodied resilience and reinvention by blending her Italian creativity with American entrepreneurship. Through in-depth discussion with Kanner in 2024 and her daughter, Giulianella, this study explores her path – from her formative years in Italy during Fascism, to meeting her American soldier husband in Naples, to formally working at her mother-in-law's store, Talbert, in New York City. Findings show her unique ability to envision one-of-a-kind pieces, while working with local artists. Ultimately, the end goal of this research is to highlight the transformative experience of an immigrant as it shaped artistic expressions.

SESSION 3 POSTER PRESENTATIONS

3:15 pm to 4:15 pm

Basic Sciences

1 Genetic Engineering of Taurine Biosynthesis in Plants

By: Xing-Hai Zhang, Anglaise Joseph, Elizabeth Grilo, Francisco Urteaga-Mariani, Jeff Debrine, Gold Akinade, Yasmine Duran, and Ryan Nagy
Faculty Mentor: Xing-Hai Zhang
Presenters: Anglaise Joseph, Elizabeth Grilo, Yasmine Duran, Francisco Urteaga-Mariani, Jeff Debrine, Gold Akinade, and Ryan Nagy

Taurine is an amino acid derivative essential in human physiological processes. While animals, humans, and some microalgae synthesize taurine naturally, plants lack the complete biosynthetic pathway. Modern genetic engineering suggests introducing taurine biosynthetic genes into plants could enable taurine production, offering a sustainable nutritional source. Studies on microalgae indicate that certain plants possess partial taurine biosynthetic pathways, suggesting key enzymes can be introduced through bioengineering. This study aims to genetically modify tobacco plants to produce taurine by introducing FMO1 and CSAD genes via Agrobacterium tumefaciens-mediated transformation. The T-DNA region of a binary vector containing these genes was inserted into the plant's genome, and transformed plants were screened for antibiotic resistance. Plants with high expression were analyzed by tissue culture, qPCR, RT-qPCR, and LC/MS for taurine content. Our research will reveal whether FMO1 and CSAD genes can restore taurine biosynthetic pathways in plants enhancing crop's nutritional and medicinal values.

Health & Medical Sciences

2 Phantom limb pain (PLP) and the Cortical Reorganization Theory (CRT)

By: Jamya Bradley
Faculty Mentor: Gary Perry
Presenter: Jamya Bradley

Phantom limb pain (PLP) affects approximately 80 percent of people who undergo amputation. Following an amputation, patients experience painful sensations they think stem from the no longer present limb. Here, we review research that supports the Cortical Reorganization Theory (CRT), which suggests that after amputation, a map created by the brain to represent the body called the Neuromatrix undergoes reorganization, contributing to the painful perceptions. The Neuromatrix refers to a network of brain regions involved in sensory, emotional, and cognitive information, creating a unified sense of oneself and body plane. The reorganization leads to the misinterpretation of sensory signals, contributing to pain perception. We also review research on various treatments of PLP that range from pharmacological medications to innovative treatments like mirror therapy. Mirror therapy is a treatment of PLP that is commonly practiced and demonstrates the connection between perception and the painful sensations experienced in PLP.

Health & Medical Sciences

3 Analysis of Neuronal IL-1R1 Expression's Influence on Mouse Self-grooming Behavior Using DeepLabCut

By: Firas Syed, Daniel P. Nemeth, Matt S. Schrier, and Ning Quan
Faculty Mentor: Matt Schrier
Presenter: Firas Syed

Interleukin-1 (IL-1) is a cytokine with many physiological effects that influence the nervous system, potentially causing important behavioral changes. IL-1 activates its receptor, IL-1R1, on cell types that express it. This study investigates the role of neuronally-expressed-IL-1R1 in mouse self-grooming and OCD-like behaviors by utilizing DeepLabCut, a behavior analysis tool that quantifies behavior using machine learning. Despite the accumulation of literature demonstrating neuroimmune interactions, a significant gap remains in the understanding of the relationship between brain IL-1 signaling and OCD symptoms. Using DeepLabCut to quantify grooming behaviors of transgenic IL-1R1 knockout versus IL-1R1-expressing mice, we found a statistical trend indicating that mice lacking IL-1R1 expression undergo increased bouts of self-grooming behavior. This may have translational value, considering OCD symptoms' links with autoimmune conditions. The findings from this study will contribute to the field by elucidating connections between neuroimmune signaling and mammalian behavior, with implications for therapeutic approaches in OCD/related disorders.

Health & Medical Sciences

4 Music for the Soul: Assessing How Conditions Impact Effectiveness of Music Therapy in Hospice Care

By: Tuang Vaan and Wen Shen
Faculty Mentor: Wen Shen
Presenter: Tuang Vaan

Music therapy in hospice care is regarded as a reliable and effective means of diminishing pain and comfort in patients in their last days. However, hospice patients come with a variety of medical and psychological conditions, and there is little research on how the level of effectiveness of music therapy may differ between conditions. This project explores how hospice patients' conditions influence music therapy effectiveness in relieving pain and discomfort. Relevant publications from academic databases like PubMed will be organized in management tools like Zotero and further analyzed to identify trends, patterns, and other insights. The findings aim to provide a better understanding of the correlation between the type of condition and therapy effectiveness of music therapy, which can be useful in determining which conditions are best suited for music therapy and which ones are best suited for alternatives that can better reduce pain and discomfort in hospice care.

SESSION 3 POSTER PRESENTATIONS

3:15 pm to 4:15 pm

Health & Medical Sciences

5 Pathology and Therapeutic Strategies for Alzheimer's Disease

By: Maria Duque Santana, Malaya Melancon, Kaitlyn Keaton, Siri Condikey, Kira Madlin, Ganesh Chapagain, Madison White, Howard Prentice, Rui Tao, and Jang-Yen Wu
Faculty Mentors: Howard Prentice and Siri Condikey
Presenters: Malaya Melancon, Kaitlyn Keaton, and Maria Duque Santana

Our recent studies of human brain imaging point to a role for the glymphatic system in the failure to clear beta amyloid from the CNS in Alzheimer's disease (AD). In relation to Alzheimer's disease, we aim to measure expression of molecular viability markers of the glymphatic system. In brain sections previously obtained from mouse Alzheimer's disease line (3 x Tg-AD) we will quantify expression by confocal microscopy of two markers: namely vascular endothelial growth factor receptor -3 (VEGFR-3) and lymphatic vessel endothelial hyaluronan receptor-1 (LYVE-1). To analyze novel therapeutics, we have optimized and characterized the differentiated cholinergic neuronal cell line SHSY5Y for assessment of excitotoxicity as well as neuro-protection. The neuroprotectants are 1). taurine which prevents calcium overload and apoptosis in several models of neurological disease and 2). a disulfiram metabolite-Carbamathione, which prevents excitotoxity though its action as a partial NMDA glutamate receptor antagonist.

Basic Sciences

6 As Blood Dries, is there a Similarity Between the Remains of Blood After it is Wiped Away and the Time the Blood was Left on the Surface?

By: Tzipporah Wodinsky, Jenna Grosskopf, Rubi Regan and Patrick McLaughlin
Faculty Mentor: Patrick McLaughlin
Presenters: Tzipporah Wodinsky and Jenna Grosskopf

When blood is dropped on a surface and left for a considerable amount of time, a skeleton starts to form. A blood skeleton is the remains of the blood after it is wiped away. The question is, could that help in determining a time of death within a crime scene? Most times, when a time of death is determined in a homicide, the body must be present. This research is focused on determining if a time of death can be determined from the blood left behind. With this in mind, detectives and criminal investigators can start determining a case even if a body is not present. Depending on the surface, and amount of time the blood has been sitting, the skeleton may look different.

Basic Sciences

7 Investigation into the Pathogenesis of Parkinson's Disease: Looking at the Interplay Between Oxidative Stress and Alpha-synuclein Aggregation

By: Jalen Velasquez
Faculty Mentor: Gary Perry
Presenter: Jalen Velasquez

Parkinson's disease is a neurodegenerative disorder where there is degradation of dopaminergic neurons in the substantia nigra, leading to motor symptoms including bradykinesia, tremors, rigidity, as well as non-motor symptoms including insomnia, constipation, and cognitive decline. Oxidative stress and alpha-synuclein aggregation are key factors to the pathogenesis of Parkinson's disease, driving neuronal damage. Here, we review research showing oxidative stress, arising from mitochondrial dysfunction and oxidation of dopamine, produces ROS which leads to cellular death. Alpha-synuclein aggregates into toxic oligomers which innervate cell membranes. Due to implications of alpha-synuclein aggregation in the pathogenesis of Parkinson's disease, therapeutic strategies to limit aggregation are of much interest. Possible methods include gene therapy of the SNCA gene, enhancing the clearance of alpha-synuclein, and drug inhibitors to prevent the misfolding of the protein. This poster will focus on ROS levels, protein aggregation, and its potential as a therapeutic agent and biomarker.

Environmental, Ecological & Marine Sciences

8 How Human Activities Impact Wildlife Health and Injury Severity in South Florida

By: Nicole Alexiou and Tobin Hindle
Faculty Mentor: Tobin Hindle
Presenter: Nicole Alexiou

Native South Florida fauna have been given many struggles since humans have taken over their environment. The land in which they used to take over is now extremely dangerous and they face many threats in their daily lives. Especially since South Florida is so heavily populated, human related injuries and deaths happen to them every day. Issues that impact wildlife due to human activities include car collisions, pollution, and urbanization, and the effects from these issues are unfortunately common for the native animals that live in this area. I am examining how anthropogenic activities can negatively impact native south Florida wildlife. Using patient cases from South Florida Wildlife Center located in Ft. Lauderdale, Florida, I will be analyzing injury severity, injury type, and outcome of the patient in avian, mammalian, reptilian, and marsupial animal groups.

SESSION 3 POSTER PRESENTATIONS 3:15 pm to 4:15 pm

Basic Sciences

9 Ionophore–based Organosilicon Nanosensor for Electrolyte Ion Sensing

By: Riad Rustamov, Dulal Khan, and Renjie Wang
Faculty Mentor: Renjie Wang
Presenter: Riad Rustamov

Electrolyte ions including K^+, Na^+, Ca^{2+} are closely linked to heartbeat regulation, muscular contraction, neural transmission, and kidney function. The importance in ion detection is that it may indicate deviations in normal physiological processes or indicate disease conditions like cancer, cardiac issues, etc. Therefore, developing specific tools that are of high selectivity and sensitivity is very important in observing the spatiotemporal dynamics of ion fluctuations. In this work, organosilica nanoparticles (SiO_2) are synthesized to be integrated with ionophore–based ion selective sensing principle for target ion sensing. We developed ionophore–based SiO_2 nano sensors which bind to electrolyte ions, causing fluorescence variations that enable ion concentration measurement. The detection range for K^+, Ca^{2+}, and Na^+ are from 10 μM to 0.1 M, 10 μM to 1M, and 100 μM to 0.1 M, respectively. These ion sensing findings should provide valuable insight in research for medical diagnostics and various general intracellular processes.

Basic Sciences

10 Building a Bimetallic Tripod Pincer System Catalyst for Investigating Electrocatalysis of CO_2 Reduction

By: Shaaz Mumtazali, Jonas Putigna, and Zhu–Lin Xie
Faculty Mentor: Zhu–lin Xie
Presenter: Shaaz Mumtazali

The rise in greenhouse gas emissions has led researchers to develop artificial photosynthetic systems to reduce these gases. One of the challenges is the development of efficient, stable catalysts for CO_2 conversion. Bimetallic molecular catalysts significantly enhance catalytic activity due to the dinuclear metal synergistic catalysis (DMSC) effect. There are still knowledge gaps regarding how these centers cooperate and how structural modifications influence performance. To achieve this, we propose the synthesis of bimetallic Co(II) tripod pincer complexes incorporating pyridazine, amine, and pyridine moieties. Modulation of catalyst stability and activity will be achieved by varying R groups (H, methyl). The complexes will be characterized using X–ray diffraction, NMR, and UV/Vis spectroscopy. Electrocatalytic activity will be explored by cyclic voltammetry (CV) and controlled potential electrolysis (CPE). This system is expected to exhibit greater stability and turnover frequency compared to mononuclear catalysts and enhance the efficiency of CO_2 reduction.

Behavioral, Educational & Social Sciences

11 tACS-Induced Gamma Synchronization in the Visual Cortex Enhances Contour Integration

By: Zhaira Rodriguez, Yosun Yoon, and Sang Wook Hong
Faculty Mentor: Sang Hong
Presenter: Zhaira Rodriguez

For the visual cortex to perceive an object as a coherent whole, the parts that constitute the object must be coherently integrated. Electrophysiological studies have shown that oscillatory neural activity at gamma frequency (>30 Hz) is associated with visual integration for coherent object perception. However, whether gamma oscillations play a direct role in object perception or merely reflect an epiphenomenon remains unclear. To investigate the causal relationship between gamma oscillatory activity and object perception, 40-Hz transcranial Alternating Current Stimulation (tACS) was applied across the visual and parietal cortices while participants searched for a target line composed of four separate segments among randomly oriented and positioned distractors and reported its orientation. Compared to the sham control group, participants who received 40-Hz tACS showed a statistically significant improvement in task performance during stimulation relative to pre-stimulation performance. The results suggest a causal link between gamma activity and contour integration in object perception.

Behavioral, Educational & Social Sciences

12 Defying Expectations: The Role of Ostracism and Group Identification on Responses to Stereotype-Threat

By: Hannah Kravec, Laura Gust, Chad Forbes, and Robin Vallacher
Faculty Mentor: Robin Vallacher
Presenter: Hannah Kravec

Stereotype threat is a known psychological barrier for women in STEM fields, where concerns about confirming negative stereotypes can impair performance (Carli et al., 2016). Experiences of workplace ostracism have been linked to adaptive, success-oriented behaviors (Xu et al., 2015). This study tested whether women's experiences of ostracism from other women influence their determination to refute stereotypes, resulting in increased success-driven behavior during a stereotype-threat inducing task. Participants were given an adaptive math task during which they were given the option to view helpful review sheets before answering questions. It is anticipated that women who feel more ostracized will spend more time engaging with review sheets, reflecting success-oriented behavior. This research examines stereotype threat effects from a unique perspective, highlighting the complex nature of challenges faced by women in STEM.

SESSION 3

POSTER PRESENTATIONS

3:15 pm to 4:15 pm

Behavioral, Educational & Social Sciences

13 Effects of Proactive and Reactive Selective Attention on Episodic Memory Encoding

By: Rachel Rubenzahl
Faculty Mentor: Kevin Darby
Presenter: Rachel Rubenzahl

Cognitive science shows attention being necessary for episodic memory encoding, however, the effects of proactive and reactive attention are ambiguous. Proactive control involves anticipating where focus should be directed in preparation for an upcoming stimulus, whereas reactive control requires shifting attention in response to a presented stimulus. Selective attention is the ability to attend to specific information while ignoring distractor stimuli. Forty-one undergraduate students were presented with computer-generated tasks, and the data was analyzed using Bayesian mixed effect models. Subjects completed the attention phase by responding to visual details exhibited by one stimulus while ignoring concurrent stimuli. Subsequently, participants completed the memory phase by responding to whether they recognized items previously shown during the attention phase. Attention phase results indicate that modulating proactive and reactive attention impacts response speed and accuracy. Preliminary memory phase analyses suggest that memory speed and accuracy were not impacted by proactive and reactive attention.

Behavioral, Educational & Social Sciences

14 Tripping Over "TRIPS": International Inequities in Critical Pharmaceutical Access

By: Michael Gomez
Faculty Mentor: Anita Blowers
Presenter: Michael Gomez

Directed by the World Trade Organization (WTO), the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of 1995 is the most comprehensive international policy on the creation, definition, protection, and transfer of International Property Rights (IPR). However, this policy was particularly damaging for underdeveloped countries, as TRIPS expedited the unethical process of evergreening drug patents. As a result, the agreement forced many vulnerable regions to become dangerously dependent on foreign generic drug imports. This paper analyzes the pharmaceutical access barriers that Least Developed Countries (LDCs) face when responding to public health emergencies, the flaws in the current policy changes undertaken by world leaders, and the best way forward in amending TRIPS. The central argument of this paper posits that, to ensure long-term economic and medical development, process patents ought to no longer be protected by TRIPS, specifically by excluding Article 28.1(b) of the agreement, while simultaneously emphasizing Article 66.2.

Behavioral, Educational & Social Sciences

15 Examining Profiles Within Animal Advocacy Communities: A Latent Class Analysis

By: Sydney Haughton, Gavin Bocian, Sada Rice, and Geoffrey Wetherell
Faculty Mentors: Geoffrey Wetherell and Sada Rice
Presenters: Sydney Haughton and Gavin Bocian

Despite concern for animal welfare, the environment, and personal health, most people continue to maintain a meat-inclusive diet. Research has focused on comparing vegans to non-vegans, with less being done to examine the diversity within people with specific diets. This study explores the different groups within the animal advocacy communities. Participants will take a survey through CloudConnect. We'll run an LCA which will categorize the participants into certain possible group memberships based on their lifestyle choices and animal-related attitudes. We will then correlate classes to the outcomes, such as their political views/affiliation, determining if there is any possible correlation. Common vegan social perception literature predicts vegans to be sympathetic. However, other subgroups may diverge (e.g. effective altruist). We hope these insights help advocacy groups build more inclusive spaces and reach a broader audience.

Behavioral, Educational & Social Sciences

16 Does Maternal Dispositional Empathy Predict Maternal Intrusiveness in Online Infant-Mother Interactions?

By: Elizabeth Hernandez, Jacqueline Hammack, and Teresa Wilcox
Faculty Mentor: Teresa Wilcox
Presenter: Elizabeth Hernandez

Previous studies have investigated the associations between maternal dispositional empathy and harsh parenting behaviors— which sometimes include intrusiveness as a subset of harsh parenting. To date, no study has directly investigated the associations between maternal dispositional empathy and maternal intrusiveness. This study investigated whether maternal dispositional empathy is associated with maternal intrusiveness in online infant-mother interactions. A final sample of 103 infants (ages 6 to 24 months old) and their mothers participated in a five-minute free-play session via Zoom. The Interpersonal Reactivity Index (IRI) was administered to the mothers within one week of the session to assess maternal dispositional empathy. The Coding Interactive Behaviors (CIB) scale was used by trained coders to determine maternal intrusiveness. The anticipated outcome includes maternal dispositional empathy negatively predicting maternal intrusiveness. These findings will expand on past studies by further directly linking maternal dispositional empathy and maternal intrusiveness.

SESSION 3

POSTER PRESENTATIONS

3:15 pm to 4:15 pm

Classroom Research Project/Assignment

17 Balancing Justice: How Team Members of Drug Court Align Community Safety with Rehabilitation

By: Mia Mondello
Faculty Mentor: Lincoln Sloas
Presenter: Mia Mondello

Problem-solving courts, particularly drug courts, differ significantly from the traditional justice system by prioritizing rehabilitation and community safety over punishment. These courts focus on nonviolent offenders struggling with substance use disorders. A multidisciplinary team—including judges, prosecutors, defense attorneys, and probation officers—works collaboratively, setting aside adversarial roles to support participants in achieving sobriety, personal growth, and reintegration into society. Through individualized treatment plans, participants are guided toward recovery, employment, and education, with the incentive of reduced or dismissed charges upon program completion. Observations in the Palm Beach County drug court revealed judges fostering supportive environments by encouraging higher education opportunities, such as trade licenses or English classes, to empower participants' long-term success. Additionally, sanctions and incentives are applied strategically, balancing compliance with deeper treatment needs for those at risk of relapse. These approaches demonstrate that therapeutic, tailored interventions reduce recidivism while enhancing community safety.

Classroom Research Project/Assignment

18 The Influence of Age, Education, and Ethnicity on Contraceptive Choice and Typical Use Effectiveness Among Military Women

By: Helen Grammen and Candy Wilson
Faculty Mentor: Candy Wilson
Presenter: Helen Grammen

Most women that are childbearing age in the United States military are at risk for unintended pregnancies, which can result in physical, emotional, and financial stress. The purpose of this study was to examine the influence of age, ethnicity, and level of education on the choice of contraception and its typical use effectiveness among military women. The sample consisted of 60 active-duty military women, average age was 29.91 (range 18-42) years old with access to universal healthcare, getting reproductive healthcare at a military treatment facility. Results revealed trends but no statistically significant differences between age, ethnicity, or education on contraceptive choice and typical use effectiveness. This was interesting as it indicates military women, regardless of these demographic factors, tend to seek more reliable contraceptives that support their military readiness. These findings are encouraging, suggesting that demographic differences do not influence contraceptive choices in ways that would affect preparedness for deployment.

Cross Disciplinary Projects

19 Manufactured but Mine

By: Miguel Paes

Faculty Mentor: Williamena Granger

Presenter: Miguel Paes

This research examines how manufactured homeowners experience sense of place and community in mobile home parks. Manufactured houses, still widely known as 'mobile' or 'trailer' homes, are frequently thought of as temporary moving structures even though the vast majority never leave their original site. This dissonance in perception and reality has left manufactured homeowners struggling to ground themselves in a volatile housing landscape. In order to understand place-making in mobile home parks, I investigated a few selected parks in Palm Beach County through surveys, interviews, and archival research. Qualitative data results informed me of the diversity present in this population and housing typology, as well as patterns in how homeowners physically manifested their sentiment through the built environment. My findings point to a correlation between spatial marginalization and material expression. Further research needs to address causality in the observed pattern behaviors.

Engineering

20 Biomechanical Simulation of Postoperative Range of Motion Following Spinal Fusion Surgery for Scoliosis Correction Using 3D Modeling and Finite Element Analysis

By: Sofia Blanco, Ekansh Puri, Evalyn Tonos, Colby Abuhoff, Sofia Dasilva, Grace Zhu, and Sonal Damle

Faculty Mentor: Chi Tay Tsai

Presenters: Sofia Blanco, Ekansh Puri, Evalyn Tonos, Colby Abuhoff, Sofia Dasilva, Grace Zhu, and Sonal Damle

Patients undergoing spinal fusion surgery, the standard treatment for scoliosis, may not be fully aware of its implications, especially on the change in Range of Motion (ROM). To resolve this, we aim to simulate the predicted ROM for the spine following spinal fusion surgery using Materialise and Ansys 3D modeling software. A CT scan of a spine with scoliosis will be obtained, and spinal fusion surgery equipment will be scanned and validated on Mimics and 3-Matic. Equipment and spine will be combined for a simulated reconstruction of a two-level spinal fusion. Finally, the model will be imported into Ansys, where physiological loads will be applied to replicate the surgery's forces, comparing predicted postoperative ROM against preoperative ROM. The results are expected to provide surgical candidates with quantifiable data on the extent of the motion limitation patients may experience, and serve as a supplement to the recommendations provided by physicians.

SESSION 3 POSTER PRESENTATIONS

3:15 pm to 4:15 pm

Environmental, Ecological & Marine Sciences

21 Microbiome Solutions for Early Tomato Blight Disease

By: Nwadiuto Esiobu, Shan Damas and Tanvi Desai
Faculty Mentor: Nwadiuto Esiobu
Presenters: Shan Damas and Tanvi Desai

Blight disease is a devastating fungal disease affecting crops around the globe. Everyone knows and consumes tomatoes for their nutritive value and taste; a stable production for them is necessary. However, early blight has affected their yield over the last few years. This study aims to improve disease resistance in susceptible tomato varieties. The design was to plant two varieties, one resistant (Bush) and one susceptible (Roma); they were grown under the same conditions. However, microbiome analysis showed that 80% of the resistant isolates were gram–positive, meaning they could thrive in harsher conditions. Many biocontrol agents were found in the resistant shoot, including *Pseudomonas*–like *Klebsiella pneumonia*, which contained some antifungal properties. Since we know blight is an airborne disease, its presence in the phyllosphere suggests a microbiome–driven defense. Future studies will use metagenomics to characterize microbiomes and develop microbiome–based solutions for disease–resistant crops.

Environmental, Ecological & Marine Sciences

22 Examining the Effects of Genetically Modified Soybeans on Plant and Soil Microbiomes Over Time?

By: Shania Henry, Michaela Souffranc, and Nwadiuto Esiobu
Faculty Mentor: Nwadiuto Esiobu
Presenters: Shania Henry and Michaela Souffranc

The creation of herbicide–tolerant crops has been one of the major revolutions in modern agricultural biotechnology. While genetically modified crops are important in crop yield and food security, understanding how these agricultural practices may impact plant and soil microbiomes over time is crucial for sustainability. Recent studies have shown that genetically modified crops can potentially impact soil ecosystems through dysbiosis and altered nutrient cycling. Nonetheless, more studies are needed to fully understand the role of microbiomes associated with transgenic crops. In this study, we compare the microbiomes of transgenic and wild–type soybeans to understand the effects of transgenic crops on plant and soil microbiomes. We hypothesize that bacteria involved in soil fertility and plant sustainability of the genetically modified soybeans will have a reduced abundance because of the differences in root composition and exudates. Data obtained from this research will contribute to finding solutions to improve soil sustainability.

Environmental, Ecological & Marine Sciences

23 Shaped for Speed: Vertebral Morphology in Mako Shark Keels

By: Jamie Knaub, Jake Wood
Faculty Mentor: Marianne Porter
Presenter: Klaudia Jarek

Sharks are a subclass of cartilaginous fish with a calcified vertebral column that varies in shape and mineralization pattern across species exhibiting different swimming styles. Fast-swimming sharks, such as lamnids, require optimized thrust production for efficient movement. Lamnid sharks utilize a thunniform style, where side-to-side oscillations producing thrust are constrained to the posterior body. Previously, wedge-shaped vertebrae have been documented in one lamnid species, suggesting a role in maximizing thrust production. This study examines the presence and morphology of wedge-shaped vertebrae in another fast-swimming lamnid species, the shortfin mako shark (*Isurus oxyrinchus*). We used contrast-enhanced micro-CT scans of four mako sharks and analyzed vertebral morphology in the keel; pre-caudal muscular lateral projections. The presence of wedge-shaped vertebrae in a second lamnid shark suggests the role of the keel in optimizing thrust. This study provides a greater understanding of keel morphology and the form-function relationship of mineralized cartilage to thunniform swimming.

Environmental, Ecological & Marine Sciences

24 The Role of the Government in Protecting the Environment

By: Livia Vieira
Faculty Mentor: Eric Levy
Presenter: Livia Vieira

Environmental degradation and economic growth have long been concurrent phenomena. The government's responsibility in protecting the environment has become a prominent topic in political and ethical discussions. These discussions inspired me to investigate public opinion on the role of the government in environmental protection. To test this, I designed a questionnaire with 17 questions, collected data via Amazon Mechanical Turk, and received 147 completed surveys, which were analyzed using IBM SPSS. I developed a hypothesis predicting that women and younger individuals (ages 18-35) would be more likely than men and older individuals (ages 65 and older) to agree that the government has a responsibility to promote environmental protection. The results revealed statistically significant differences at the 5% level and serve as the basis for further discussion in my research.

SESSION 3 POSTER PRESENTATIONS

3:15 pm to 4:15 pm

Environmental, Ecological & Marine Sciences

25 Expanding the Viable Growth Region of Florida's Sugarcane

By: Joshua Raia
Faculty Mentors: Nwadiuto Esiobu and Sirisha Madem
Presenter: Joshua Raia

Florida is the largest domestic producer of sugarcane in the United States, but the state's production is thermally limited to the Everglades Agricultural Area near Lake Okeechobee due to the cold temperature protection the lake provides. Consequently, significant economic opportunity exists if the viable growth region of Florida's sugarcane could be expanded. Current efforts to accomplish this goal consist primarily of extensive cultivar development. As a result, potential trait improvement through the exploitation of plant and soil microbiomes is unrealized. In this study, we aim to characterize and analyze the microbiomes of two sugarcane cultivars: one with a level of demonstrated cold tolerance and a top cultivar with cold sensitivity and high sugar content. The analysis will be performed using traditional culturing methods, biochemical assays, genomics, proteomics, and transcriptomics. The knowledge gained from this study will help in the development of bioinoculants used to improve cold tolerance in sugarcane.

Health & Medical Sciences

26 Ribosome Stalling Characterization of HTT mRNA Relevant to Huntington's Disease

By: Veronika Zaloginova
Faculty Mentor: Srinivasa Subramaniam
Presenter: Veronika Zaloginova

Huntington's Disease (HD) is a neurodegenerative disorder caused by CAG repeat expansions in the Huntingtin (HTT) gene, leading to mutant HTT (mHTT) protein production. Polyglutamine tracts in exon 1 of mHTT disrupt ribosome function, causing stalling during mRNA translation. Using a dual-reporter (GFP–HTT–mCherry) construct, ribosome stalling and associated translation inefficiencies were analyzed in striatal neuron models. Sucrose gradient fractionation revealed altered ribosomal distribution and stalled HTT products in mutant cells, with increased smaller protein fragments indicative of stalling and degradation. Cryogenic electron microscopy (cryo-EM) showed structural differences in ribosomes from HD models compared to controls. Additionally, CAA interruptions in CAG repeats correlated with altered stalling patterns and disease onset variability. These findings suggest ribosome stalling as a key mechanism contributing to HD pathology, providing insight into translational dynamics and potential therapeutic targets.

Health & Medical Sciences

27 The Effects of Oleuropein and Calcitriol on the Viability, Migration, and Invasion of Endometrial Cells

By: Katelyn Devereaux, Gianna Parente, and Fiona Flavy
Faculty Mentor: James Hartmann
Presenters: Gianna Parente and Fiona Falvy

Endometriosis is a chronic, inflammatory disease that severely impacts women's health all around the world, causing pain, infertility, and reduced quality of life. It is characterized by the ectopic growth of endometrial-like tissue outside the uterus. Unfortunately, effective treatments remain limited. Recent studies suggest that oleuropein, a polyphenol found in olives, and calcitriol, the active form of vitamin D, may offer therapeutic potential due to their anti-inflammatory, antioxidant, and immunomodulatory properties. This research aims to explore their effects on key processes in endometriosis, including cell viability, migration, and invasion, in order to uncover new therapeutic avenues for managing this debilitating disease.

Health & Medical Sciences

28 Bleeding Compassion: Exploring the Prevalence of Bullying in the Nursing Workplace and Its Impact on Professional Wellbeing

By: Laura Vanderschuur and Joy Longo
Faculty Mentor: Joy Longo
Presenter: Laura Vanderschuur

Nurse-on-nurse bullying, or horizontal violence (HV), is a problem that can impact the well-being of nurses and effect patient outcomes. The purpose of this study is to shed light on the phenomenon of HV and the effects of this type of bullying on nurses. This study is guided by Dr. Ray's Theory of Bureaucratic Caring and Tompkins Affect Theory. Samples of nurses both currently employed and not currently employed were studied. Also discussed were the neurobiological and neuroanatomical effects of these experiences on individuals and the impact it has on turnover intention. The findings showed that only 20% of respondents reported not experiencing bullying in the workplace within the last six months, and all other nurses (80%) reported experiencing this phenomenon. These findings bring awareness to the extent of bullying in nursing and can help employees and employers identify incidences of bullying, leading to the future of healthier workplaces.

SESSION 3 POSTER PRESENTATIONS 3:15 pm to 4:15 pm

Health & Medical Sciences

29 The Effects of Torin-1 on Doxorubicin-Induced Toxicity in Human Coronary Arterial Endothelial Cells

By: Jack Meyer, Juliana Marques, and Claudia Rodrigues
Faculty Mentor: Claudia Rodrigues
Presenter: Jack Meyer

Doxorubicin is a potent chemotherapy agent with restricted use due to cardiovascular toxicity. Preservation of endothelial cell function has been considered a potential approach to prevent doxorubicin-induced cardiotoxicity. Endothelial dysfunction contributes to inflammation, oxidative stress, and impaired cardiovascular function. This study explores the potential of Torin-1, an inhibitor of the mTOR pathway and inducer of autophagy, to counteract the toxic effects of doxorubicin in Human Coronary Arterial Endothelial Cells (HCAECs). Little is known about the role of autophagy in doxorubicin-induced endothelial toxicity and our studies are expected to provide insights into mitigating doxorubicin's toxic effects and enhancing endothelial cell survival. We treated HCAECs with doxorubicin and different doses of Torin-1 and analyzed cell proliferation and viability after 48 hours. Torin-1 did not reverse doxorubicin's effects on cell proliferation and had no significant impact on viability. At a high dose, Torin-1 alone impaired cell proliferation independent of doxorubicin.

Health & Medical Sciences

30 An Overinflated Balloon Belly – Case Report of Abdominal Compartment Syndrome

By: Katherine E Brown, JD Foureau, Jean Pierre, and Gary Perry
Faculty Mentor: Gary Perry
Presenter: Jean Pierre

Abdominal compartment syndrome is a condition involving intra-abdominal pressure that leads to a significant impact on multiple organ systems, with high risk of poor prognosis and increased mortality. A 36-year-old woman presented to the emergency department with a chief complaint of "altered mental status," with unstable vital signs and a distended and rigid abdomen. The patient underwent delayed sequence intubation and nasogastric tube placement and started on norepinephrine. CT imaging showed significant free air in the abdomen, compressing multiple organs, and bilateral pneumothoraces. The patient subsequently underwent abdominal percutaneous catheterization with a release of a gush of air, with significant improvement in hemodynamic status. She underwent bilateral chest tube placement and exploratory laparotomy. The intra-abdominal injuries noted during her operations were mild contusion to the posterior wall of the stomach and a stable renal hematoma. Thus, the cause of abdominal compartment syndrome is shown to be due to her pneumothoraces.

Health & Medical Sciences

31 Inhibition of c-Myc Within Liver Sinusoidal Endothelial Cells Leads to Alterations in Energy Metabolism and Protein Synthesis

By: Brandon M. Trenta, Juliana Marques, Michelle Shanefield, and Claudia Rodrigues
Faculty Mentor: Claudia Rodrigues
Presenter: Brandon Trenta

Liver inflammation and fibrosis are key contributors to chronic liver disease. Liver sinusoidal endothelial cells (LSECs) serve as a permeable barrier between blood and hepatocytes. LSECs dysfunction has been shown to play a crucial role in the development of fibrosis and inflammation. Previous findings from our laboratory showed that endothelial deficiency of the transcription factor c-Myc enhances diet-induced liver inflammation and fibrosis in mice. The goal of the current study is to investigate the impact of inhibiting c-Myc in human LSECs (HLSECs). Cells were treated with increasing doses of 10058-F4, known to inhibit c-Myc transcriptional activation. Results suggest that c-Myc regulates functions associated with endothelial activation, mitochondrial function, autophagy and proliferation. Analysis of cell viability showed expected reduction in proliferation. Assessment of mitochondrial function indicated a significant decline in mitochondrial respiration. Our findings suggest that c-Myc deficiency promotes HLSEC endothelial activation through mechanisms associated with deregulated energy metabolism and autophagy.

Health & Medical Sciences

32 Doxorubicin Exposure Promotes Upregulation of ULK1 in Human Coronary Artery Endothelial Cells

By: Stella Potenti, Michelle Shanefield, Juliana Marques, and Claudia Rodrigues
Faculty Mentor: Claudia Rodrigues
Presenter: Stella Potenti

Cardiotoxicity is a well-known adverse effect of a potent class of chemotherapy agents known as anthracyclines, increasing the risk of cardiovascular disease in cancer survivors. Current strategies to prevent anthracycline-induced cardiotoxicity are limited. The relevance of endothelial dysfunction to anthracycline-induced cardiovascular disease has been recently reported. However, little is known about the mechanisms by which anthracyclines cause endothelial injury and dysfunction. Previous findings from our laboratory suggest the activation of autophagy in human coronary artery endothelial cells (HCAEC) exposed to the anthracycline doxorubicin. In the present work we analyzed the expression of ULK1, a kinase that plays an essential role in autophagy initiation, in HCAECs exposed to doxorubicin. Cells were treated with different doses of doxorubicin, and lysates were collected at different time points for analysis of ULK1 expression by western blot. Our results indicate that exposure to doxorubicin increased ULK1 expression in a dose and time dependent fashion.

SESSION 3

POSTER PRESENTATIONS

3:15 pm to 4:15 pm

FROM UNDERGRADUATE RESEARCHERS AT PALM BEACH STATE COLLEGE

Engineering

33 Interactive Motion-Based Automation System with Environmental Monitoring Using Raspberry Pi

By: Wahida Nipun
Faculty Mentor: Eva Suarez
Presenter: Wahida Nipun

In this project, I will design an interactive motion-based automation system using Raspberry Pi, ultrasonic sensors, and relay modules. The system will automatically detect motion and trigger light and sound effects while simultaneously measuring temperature and humidity using the DHT22 sensor. This research explores how automation systems can be used for both security applications and environmental monitoring. The system will be programmed in Python using the Adafruit_DHT and libioplus libraries. By integrating both motion detection and environmental sensors into one system, this research demonstrates how intelligent automation can provide enhanced functionality for real-time environmental changes. The findings will contribute to the development of more sophisticated automation systems with real-time data display, offering practical applications in smart homes, security, and environmental monitoring. This project demonstrates how simple yet advanced technology can significantly improve real-world automation applications.

Health & Medical Sciences

34 Total Nitric Oxide and Endothelial Function Responses to Acute High-Intensity Interval Exercise

By: Matthew Schallipp, Chun-Jung Huang, and Brandon Fico
Faculty Mentor: Brandon Fico
Presenter: Matthew Schallipp

This study aimed to investigate the effects of high-intensity interval exercise (HIIE) on endothelial function. We hypothesized that endothelial function (total nitric oxide [NOx] and flow-mediated dilation [FMD]) would increase following HIIE. Seventeen young male participants completed HIIE on a treadmill. NOx and FMD measurements were taken prior to, immediately following exercise, and 1 hour and 2 hours into recovery. There was a significant time effect for serum NOx following HIIE ($p=0.037$) with a significant increase immediately following exercise ($p=0.002$), that returned to baseline levels at 2 hours into recovery. There was a significant time effect for FMD following HIIE ($p<0.001$) with a significant decrease immediately following exercise ($p=0.027$), followed by an increase above baseline at 1 hour and 2 hours into recovery ($p=0.029$, $p<0.001$; respectively). These findings suggest that HIIE may serve as an effective stimulus to enhance endothelial function and nitric oxide production, contributing to improved vascular health.

Engineering

35 Porcine Esophagus-Derived Decellularized Extracellular Matrix Hydrogels to Use for Testing Esophageal Cancer Treatments

By: Isabel Tantalean and Kevin Kang
Faculty Mentor: Kevin Kang
Presenter: Isabel Tantalean

Six hundred thousand people globally are diagnosed with esophageal cancer every year. There is a need to develop a new esophageal biomimetic material that can feasibly and affordably grow cancer cells to be used as an alternative to in-vivo animal models. Changes in incubation time for hydrogels made from porcine decellularized extracellular matrix (dECM) have not been thoroughly researched. This study aims to synthesize porcine-derived esophageal dECM hydrogel and test how different lengths of incubation time affect its mechanical properties and biocompatibility. The methodology includes synthesizing the hydrogel and testing physiochemical, mechanical, and biological properties. Some highlighted methodologies include scanning electron microscopy for pore structure analysis, rheological testing for mechanical properties, and MTT testing for cell viability. The anticipated result is that the porcine-derived dECM hydrogel will be able to mimic the microenvironment of cancerous esophageal tissue and be able to grow human esophageal cancer cells.

SESSION 3

POSTER PRESENTATIONS

3:15 pm to 4:15 pm

Classroom Research Project/Assignment

36 Public Perceptions of Volunteer Police Officers

By: Duha Mabchour
Faculty Mentor: Lincoln Sloas
Presenter: Duha Mabchour

Public opinion on law enforcement policies is shaped by political ideology, demographic characteristics, and media framing. This study examines public awareness of volunteer police officers and attitudes toward their responsibilities, particularly regarding the tools they should be permitted to carry. Using opt–in survey data from Lucid Theorem (N = 392), we analyze how factors such as political affiliation, race, income, and religiosity influence public perceptions. Chi–square analyses revealed significant relationships between demographics and support for arming volunteer officers. These findings highlight the complex relationship between political ideology, demographics, and perceptions of law enforcement. Understanding public attitudes is crucial for shaping policies that balance safety, oversight, and equity. Future research should explore how media framing and real–world experiences with law enforcement influence these perceptions.

NOTES

See how undergraduate research is making waves at FAU:

fau.edu/ouri