April 8th, 2022

12th Annual Undergraduate Research Symposium

Welcome

Welcome to the 12th Annual Undergraduate Research Symposium, which showcases undergraduate students at FAU who are engaged in research, scholarship, and creative activities. Students present their findings through poster or visual and oral or performing arts presentations, and represent all disciplines, all colleges, and all campuses of FAU.

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

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

Graduate College

OURI Faculty Liaisons & Peer Mentors

Staff and Student Volunteers

Undergraduate Studies

University Communications - Marketing and Creative Services

University Libraries

Table of Contents

Agenda

Undergraduate Research Symposium
Friday April 8th, 2022

Time	Event	Location
8:00 a.m. – 2:00 p.m.	On-Going Registration	Outside Live Oak Pavilion
8:00 a.m. – 9:00 a.m.	Coffee	Outside Live Oak Pavilion
8:15 a.m. – 8:30 a.m.	Welcome Message: Provost Danilowicz	Patio of Live Oak Pavilion
8:30 a.m. – 9:30 a.m.	Poster Session I (morning)	Live Oak Pavilions A – D
9:45 a.m. – 12:15 p.m.	Oral Sessions	Grand Palm 1, 2, 3, and 4
12:30 p.m. – 1:30 p.m.	Panel Discussion: Undergraduate Research in Education	Grand Palm Ballroom
1:30 p.m.	*Oral Presentation Winners announced:* Dr. Eric H. Shaw	Grand Palm Ballroom
2:00 p.m. – 3:00 p.m.	Poster Session II (afternoon)	Live Oak Pavilions A – D

Showcase and Tabling Event

Undergraduate Research in Education: A Panel Discussion

Research in Education? What does this mean? How do I do it? Why should I do it? In this panel discussion, (undergraduate and graduate) students and classroom teachers who have conducted research in university, K-12 classrooms, schools, and community settings will describe what, how, and why research can and should be conducted in the field of education. Attendees will also have the opportunity to query panelists about research in education.

Panel Moderator:

Sharon M. Darling, Ph.D., Associate Professor, Department of Exceptional Student Education College of Education, Florida Atlantic University

Panelists:

- Mr. Christopher Clevenger, FAU High School Teacher/Researcher
- Ms. Kayla Crawford, OURI-COE Undergraduate Researcher of the Year, OURI Peer mentor
- Ms. Daniely DaSilva, Department of Special Education Undergraduate Student/Researcher
- Mr. Paul Massy, M.Ed., Department of Special Curriculum and Instruction Doctoral Candidate/Researcher
- Ms. Kerry Wittel, M.Ed., Department of Special Education Doctoral Candidate/Researcher

Awardees

2021-22 Undergraduate Researcher of the Year Winners

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

The 2021-22 Awardees:

Undergraduate Researcher of the Year	College	Faculty Mentor
Jaimie Yap	Dorothy F. Schmidt College of Arts & Letters	Carol Mills
Christiaan Lecky	College of Business *Allen E. Smith Awardee*	Eric Levy
Kayla Crawford	College of Education	Philomena Marinaccio
Thu Nguyen	College of Engineering & Computer Science	Daniel Meeroff
David Harbaugh	Harriet L. Wilkes Honors College	Catherine Trivigno
Vanessa Stubbs	Charles E. Schmidt College of Medicine	Ceylan Isgor
Angela Siclari	Christine E. Lynn College of Nursing	Nancey France
Satviki Singh	Charles E. Schmidt College of Science	Vivian Merk
Robin Jimenez-Bean	College of Social Work and Criminal Justice	Morgan Cooley

2021-22 Distinguished Mentor of the Year Winner

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. Keith Jakee
Harriet L. Wilkes Honors College
Associate Professor of Economics

Dr. Jakee has extensive experience advising and mentoring students in research, having supervised several undergraduate and graduate students before coming to FAU. Over the years, he developed a special research-thesis class, to explicitly teach the often-difficult process of research and academic writing. This class has had a deep effect on many students who have taken it at the Honors College, where each student is required to complete an original thesis. Years after graduating, many students point to this class as being one of the most formative and important in their professional lives. Dr. Jakee has supervised over 60 undergraduate senior honors theses since starting his position at FAU in 2005 and has—within the past three years alone—supervised 18 theses. From these, he has published 4 peer-reviewed academic articles with students as co-authors, and he has several papers with students in preparation for publication. His students have clearly benefited across multiple areas of their personal and career development because of his unwavering support and commitment. As one student stated "The knowledge I gained as his student goes beyond Economics teaching and into personal development. He has been, without a doubt, a distinguished mentor for me and many other students in the Honors College who have had the opportunity to work with him."

2021-22 Barry Goldwater Scholarship Recipients

Recipient	College	Faculty Mentor
Samantha Zaninelli	*Harriet L. Wilkes Honors College*	Dr. Erik Duboue
Kate Maier	*Harriet L. Wilkes Honors College*	Dr. Oge Marques

We are extremely proud to announce that two of our scholars have been awarded the Barry Goldwater Scholarship! They are the first FAU students to ever receive this amazing accolade! Maier and Zaninelli were selected from a pool of 1,242 students from 433 institutions across the country.

Over its 30-year history, Goldwater Scholarships have been awarded to thousands of undergraduates, many of whom have gone on to win other prestigious awards like the National Science Foundation's Graduate Fellowship, Rhodes Scholarship, Churchill Scholarship, and the National Defense Science and Engineering Graduate Fellowship that support our Scholars' graduate schoolwork. Today, Goldwater alumni can be found conducting research that is helping defend the nation, finding cures for catastrophic diseases, and teaching future generations of scientists, mathematicians, and engineers!

Attention Students!

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

Submit your work to the
Undergraduate Research Journal!

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

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

Eligibility:

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

For complete information please visit the website:
http://fau.edu/ouri/ug_research_journal.php

Application Deadline: May 28th
Questions? Email: fauurj@gmail.com

Become a Peer Mentor!

Applicant Eligibility

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

What's in it for you? You will:

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

For complete information and application process visit:
http://fau.edu/ouri/peermentor_program.php

Application Deadline: May 28th
Questions? Email: ouri@fau.edu

Cover Artist Statement

Out From Artemis

Curiosity is an emotion that has overcome us since the dawn of time — it is what has allowed us to grow and evolve as a species. Discovering what lies on our planet quickly sparked the desire to investigate that which exists beyond Earth. Out From Artemis depicts an astronaut suit looking up with a combination of hope, awe, and of course curiosity.

Starting as a chemistry major myself, I have always been in tune with science. Now, as a photographer, I look at the world and abroad with the same keen eye as a researcher might. NASA's Artemis Program caught my attention as they plan to bring humans back to the moon by 2025. I saw beauty in the vision and was inspired to meld the art of image-making with science and discovery. This photo aims to encourage childlike fascination, even in our everyday lives. Inspiration may come in ways we never expect. Stop and look around. Stare up at the sky. Embrace curiosity.

Jagger Rambus, BFA in Studio Art (photography)
Dorothy F. Schmidt College of Arts and Letters

Oral Presentations

Oral Session I, 9:45 - 11:00am

Health & Medical Sciences
Sulindac and Carbamathione as Potential Therapeutic Interventions for Alzheimer's Disease
By: Daniel Gerguis, Anthony Dawod, Michael Amin, Howard Prentice, and Jang-Yen Wu
Faculty Mentor(s): Howard Prentice and Jang-Yen Wu
Presenters: **Daniel Gerguis**, Anthony Michael and Michael Amin

Alzheimer's disease is a neurodegenerative disorder that predominantly affects senior citizens causing the eradication of memory and thinking skills. Early signs of Alzheimer's cause damage to the hippocampus and entorhinal cortex. Current FDA-approved medications such as donepezil, rivastigmine, and galantamine can help mitigate the effects of mild Alzheimer's symptoms and regulate neurotransmitters; however, those medications do not completely cure the disease. Furthermore, neurodegenerative diseases are implicated with neuronal over-excitation via glutamate receptors in addition to oxidative stress and calcium overload. Sulindac, a non-steroidal anti-inflammatory medication, contributes to decreasing oxidative stress and induces pro-survival signaling in models of tissue ischemia and neuronal overexcitation. Carbamathione, a glutamate receptor partial antagonist, is protective against excitotoxicity through downregulating ER stress and mitochondrial stress. The current studies address the effects on maintaining neuronal cell viability and examine the mechanisms of Carbamathione and Sulindac-mediated neuroprotection using disease models of neuronal excitotoxicity.

Health & Medical Sciences
Determination of Isokinetic Ratios for MUC1-Derived Synthetic Glycopeptide Combinatorial Libraries
By: Ivet Boneva, Ramya Ayyalasomayajula, and Mare Cudic
Faculty Mentor(s): Mare Cudic
Presenters: **Ivet Boneva**

Mucin 1 (MUC1) is a highly glycosylated transmembrane protein, which has emerged as a promising target for cancer therapeutics and vaccines. Our approach towards development of novel cancer vaccine candidates involves synthesis of a diverse library of aberrantly glycosylated tumor associated MUC1 from which the lead compounds with desired properties are identified. The key step in the design and development of these glycopeptide combinatorial libraries is determination of the

isokinetic ratios, ultimately yielding the equal molar mixtures of MUC1 glycopeptides. To achieve this goal, a mixture of glycosylated (sialyl-Tn and Tn cancer antigen) and non-glycosylated threonine (Thr) was incorporated in a different ratio at the site of glycan attachment on MUC1. The results indicate that the optimal ratios of glycosylated vs non-glycosylated Thr was 0.4 to 0.6 equiv for position 9, and 0.35 to 0.65 equiv for position 4 and 16, respectively. The effect of neighboring glycosylation was also evaluated.

Health & Medical Sciences
Effects of Cannabidiol (CBD) in Acute and Chronic Migraine-like State.
By: Daniel F. Padron, Bianca Fakhoury, Chiara Sturaro, Lawrence Toll, and Andrea Cippitelli
Faculty Mentor(s): Lawrence Toll and Andrea Cippitelli
Presenters: **Daniel Padron**

Migraine is a complex disorder characterized by recurrent headaches associated with light sensitivity, nausea, vomiting, and comorbid symptoms of anxiety and depression. Cannabidiol (CBD), a non-psychoactive component of the Cannabis Sativa, displays a wide range of pharmacological actions that confer potential over an equally wide range of disorders, including anxiety, depression, and chronic inflammatory conditions. For this reason, we postulated that CBD may serve as a useful treatment for migraines. Using calcitonin-gene related peptide (CGRP) as a migraine-triggering agent, we found that an intraperitoneal administration of the peptide to male and female C57BL/6J mice reliably leads to the development of facial allodynia, a prominent symptom of a migraine-like state, as assessed by mechanical stimulation of the mouse periorbital region. We show here experiments that demonstrate the efficacy of CBD in preventing and treating acute and chronic allodynic responses evoked by peripherally administered CGRP in mice.

Health & Medical Sciences
Culture Conditions for the Recall of Preexisting Memory B and T cells to Childhood Vaccine Antigens within Peripheral Blood
By: Sara Thomas, Imtisal Imran, Czdari Lee, and Mahyar Nouri-Shirazi
Faculty Mentor(s): Mahyar Nouri-Shirazi
Presenters: **Sara Thomas**

Studies indicate that smokers have impaired immune responses to natural infections and booster vaccines, which could adversely influence herd immunity during pandemics and epidemics. Using an animal model, we reported that nicotine compromises the immune response to prophylactic and therapeutic vaccines by negatively affecting dendritic cell (DC) activity and ensuing DC-natural killer

cross-talk. These studies suggest that smoking may attenuate preexisting memory cells specific to childhood and booster vaccines. To test this hypothesis, we first evaluated culture conditions to detect preexisting memory cells specific to vaccine antigens in nonsmoker blood samples. For humoral immunity, R848/IL-2 was optimal for the differentiation of memory B cells into IgG-secreting plasma cells. For cellular immunity, GM-CSF most effectively supported the differentiation of memory T cells into IFN-g-producing effector cells. These select conditions can be utilized to assess the impact of external factors like smoking on the development and longevity of immune memory to vaccines.

Basic Sciences
Development and Characterization of Chitin-Mineral Hybrid Materials
By: Jo Laura and Vivian Merk
Faculty Mentor(s): Vivian Merk
Presenters: **Jo Laura**

Recent interest in biodegradable plastic alternatives have led to composite materials of chitin nanofibers used as sustainable oxygen barriers in packaging. In nature, chitin is often associated with minerals where the organic-inorganic interactions alter the mechanical behavior of bulk structures. Reinforcing chitin-based polymers with minerals can improve their mechanical properties. In this study, chitosan hydrogels were co-precipitated with minerals and underwent thermal conversion to regenerate chitin. Another method explored is the extraction of the chitin found in the cell walls of mushrooms before co-precipitation with minerals. The chemical composition and morphology of the chitin-mineral presence was confirmed by FT-IR, Raman spectroscopy, and Scanning Electron Microscopy (SEM). We performed nanoindentation experiments with atomic force microscopy to explore local variations in stiffness. The anticipated outcome of this project is to display how the organic-inorganic interactions of the biopolymer and mineral increases the overall mechanical properties, emulating what is observed in natural sources.

Basic Sciences
Investigating the Effect of Calcium Ions on Bacteriophage Activity against Xanthomonas Euvesicatoria
By: Ian Fernandez, Peter Foerster, Gage Collamore, and Daniela Scheurle
Faculty Mentor(s): Daniela Scheurle
Presenters: **Ian Fernandez**

Bacterial Spot is a common plant disease that affects tomato and pepper plants. It is caused by four bacterial strains belonging to the Xanthomonas genus: X. euvesicatoria, X. perforans, X. vesicatoria, &

X. gardneri, which have developed increased resistance to current copper-based treatments. Due to the phytotoxic tendencies of copper, we proposed a bacteriophage biocontrol as a treatment alternative to minimize negative non-target environmental impacts. Studies on the human pathogen bacillus cereus, have demonstrated that phage supplementation with Ca^{2+} caused an increase in virulence activity. It was hypothesized that phage supplementation with Ca^{2+} would demonstrate increased virulence activity against a Xanthomonas phytopathogen. A plaque assay was performed to measure the virulence of our isolated phages against X. euvesicatoria. We observed that low concentrations of Ca^{2+} resulted in prominent lytic plaques. This study served to address uncertainties regarding cation-phage interactions when tested against the growth of a phytopathogenic bacterium.

Basic Sciences
GABAA Agonist Improves Contextual Memory in Thalamic Nucleus Reuniens
By: Gabriela Rico, Ori Yarden, Oriana Williams, and Carmen Varela
Faculty Mentor(s): Carmen Varela
Presenters: **Gabriela Rico**

The thalamus is an essential cerebral structure responsible for routing information. Thalamic nuclei may effectively serve as a relay for functional contextual and behavioral states which may also include memory. Memory consolidation is known to begin short term in the hippocampus eventually transferring to the cortex for long term storage. Memory consolidation occurs predominantly during NREM sleep, the thalamus can be a mediator of consolidation activity during sleep. To explore this phenomenon, we studied the role of the thalamic nucleus reuniens (RE) in memory consolidation by inhibiting thalamic activity prior to sleep and consequently testing memory consolidation after sleep occurred. In this experiment we used a GABAA agonist to inhibit RE, examining if this thalamic region is involved in memory consolidation during a place object recognition task. We showed that memory consolidation improved after sleep with thalamic inhibition which suggests increased inhibitory GABAA activation within thalamic RE enhances memory consolidation.

Basic Sciences
Progress in the Development of Membrane-bound Metal Ion Sensors
By: Genesis Fernandez and Maciej Stawikowski
Faculty Mentor(s): Maciej Stawikowski
Presenters: **Genesis Fernandez**

The purpose of this project is to develop novel, membrane-sensitive fluorescent metal ion sensing probes. Here, we report the application of the aza-crown ether chelator coupled to a 1,8-napthalamide

fluorophore scaffold to obtain a probe geared towards the detection of calcium ions in live cells. The synthesized probe was characterized by mass spectrometry and NMR spectroscopy and further tested for mono-, di-, and trivalent cation binding in octyl glucoside micelles as membrane mimics. The obtained results with the aid of molecular dynamics simulations lay ground for the further optimization of the probe design and synthesis which is our ongoing effort.

Basic Sciences
The Role of the Drosophila Attractin Homolog in Insulin Signaling
By: Brianne Jacquet-Cribe., Nicholas Pizzo., and Tanja A. Godenschwege
Faculty Mentor(s): Tanja Godenschwege
Presenters: **Brianne Jacquet-Cribe** and Nicholas

Insulin signaling regulates biological processes of sleep, metabolism, growth, and stress resistance. Dysfunctions in transmembrane protein Human Attractin (ATRN) have been linked to diabetes, sleep disorders, and neurodegenerative diseases. The conserved intracellular MASRFP motif of ATRN is required for association with E3 ligase Mahogunin Ring Finger-1 (Mgrn1) and regulates G-coupled protein receptors (GPCR) via membrane-tethered ubiquitination to modulate a cell's response to ligand binding. Atrn-Mgrn1 promotes endolysosomal trafficking of multiple melanocortin receptors, thereby regulating feeding and pigmentation. However, in rodents, loss-of-function of ATRN or Mgrn1 also results in spongiform degeneration, but the mechanisms are poorly understood. In Drosophila melanogaster, the Attractin homolog, Distracted (Dsd), associates with dMgrn1 via the MASRFP motif and null mutants exhibit conserved degenerative vacuolization. Our lab has preliminary evidence suggesting that Dsd-dMgrn1 may regulate the insulin signaling pathways in insulin-producing cells and neurons. We will present the effects of dsd and dMgrn1 loss-of-function on insulin signaling.

Behavioral, Educational & Social Sciences
Infant Temperament in Relation to Infant and Parent Production of Communicative Gestures
By: Sarah Benoit, Kayla Bakajsza, Jacqueline Stotler, and Teresa Wilcox
Faculty Mentor(s): Teresa Wilcox and Jacqueline Stotler
Presenters: **Sarah Benoit** and Kayla

Infant temperament, broken down into negative and positive affect, is defined as individual differences in reactivity and self-regulation. Previous research indicates that infant temperament has been related to their ability to produce deictic gestures. However, this research is limited in that it relies

solely on parent-reported infant gesture production (Ollas et al., 2020). The current study expands on these findings by assessing the frequency of infant deictic gesture production and its relationship to infant temperament. Data were collected from 36 infant-parent dyads. Dyads engaged in a free-play session, recorded via a video-conferencing platform, and infant and parent deictic gesturing was coded. Parents also completed the Early Childhood Behavior Questionnaire (Putnam et al., 2010). Correlational analyses revealed no significant associations between infant temperament and their production of deictic gestures. Additional analyses revealed no significant associations between infant temperament and parent production of deictic gestures. Implications for these null findings are discussed.

Behavioral, Educational & Social Sciences
Preservice Training Perspectives Among Florida Child Welfare Workers
By: Morgan E. Cooley, Robin Jimenez-Bean, Heather M. Thompson, Marianna Colvin, and Martie Gillen
Faculty Mentor(s): Morgan Cooley
Presenters: **Robin Jimenez-Bean**

In Florida, child welfare professionals are required to train and license foster parent applicants by administering state-approved child welfare preservice training curriculum and other statute requirements (e.g., home studies). However, the research on foster parent preservice training has been limited, and the perspective of child welfare workers in how preservice training prepares foster parents for fostering is particularly underexplored. This cross-sectional research utilized administrative data including 551 child welfare workers in the state of Florida to examine workers' perceptions of the type, quality, and supplemental materials incorporated into preservice training of foster parents. Implications for future research and practice will be discussed within the context of prior literature.

Behavioral, Educational & Social Sciences
Establishing Criminal Background Questions on University Applications as Harmful to Justice-Involved Applicants and Scoring State University System of Florida Universities' Diction
By: Sydney Richner
Faculty Mentor(s): Wendy Hinshaw
Presenters: **Sydney Richner**

Criminal background questions on college admissions applications attempt to separate prospective students with a range of criminal justice experiences into neat "boxes," but they enact significant harm

in the process. Studies by the Center for Community Alternatives show a median felony applicant attrition rate of 62.5 percent, demonstrating that criminal background questions on college applications may hinder access to higher education and stigmatize justice-involved applicants. My research's purpose is to categorize common terminology found within these questions as "discomforting" or "standard." I performed a lexical semantic analysis on a list of words compiled upon dissecting the State University System of Florida's (SUS) universities′ undergraduate criminal background questions. The linguistic correlates of displeasure/pleasure, or valence, were quantified, scaled, and — according to each word — scored. SUS universities with the lowest scores contained the most "discomforting" language within their "boxes" and, therefore, should be targeted for future reformation.

Engineering
Human Activity Recognition in Parkinson's Disease Using Deep Models Trained on Healthy Population Motion Data
By: Shelly Davidashvilly, Christopher Chi, Murtadha Hssayeni, and Behnaz Ghoraani
Faculty Mentor(s): Behnaz Ghoraani and Murtadha Hssayeni
Presenters: **Christopher Chi** and Shelly

Physical activity data from patients with Parkinson's Disease (PwPD) are challenging to collect in large amounts and with good quality. Deep learning models for activity recognition require sufficient amounts of high quality data for optimal results. A common approach to this challenge involves utilizing models trained on data from young, healthy patients, which are publicly available in good amounts. However, models can struggle to generalize across these domains, largely due to motor complications affecting movement patterns in PwPD and differences in sensor axes orientations between data. We investigated the generalizability of a CNN model trained on data from the healthy population and applied directly to PwPD, and the role of data augmentation on alleviating sensor position variability. The results from the tests indicate that the method compensated for the potential sensor placement variations between data through increased accuracy when the models were applied to the different domains.

Engineering
Developing an IoT Sensor Network for Air Quality Monitoring
By: Dominique Bethel
Faculty Mentor(s): Hongbo Su
Presenters: **Dominique Bethel**

Using a low cost and energy consumption sensor system, 6 air quality variables were measured and transferred in real time to a data server for visualization and analysis. Deployed in three indoor locations at the FAU Boca campus, three systems with the same configuration were tested for two weeks. With the guidance of the CDC and FDEP, a customized air quality index (AQI) was derived and used to assess the air quality of the campus. Based on testing, it was determined that the AQI was mostly between 0 (greatest) and 50 (right before Moderate), which is considered Good on the index. This rating excludes the bumps in the data for CO_2 and total volatile organic compounds values which were between 51 and 100+, known as Moderate to Unhealthy on the AQI. Due to these considerations, the AQI of the FAU campus was concluded to be Moderate during the evaluation period.

Engineering
Rotational Plant Growth or R.P.G. is a Novel Method for Growing Food in Multi-gravitational Environments to Support Long Term Extra-planetary Missions.
By: Christopher Cadenas, Vitas Diktanas Jr., Gregory Henry, Kevin Munoz, and Omar Odeh
Faculty Mentor(s): Oscar Curet and Charles Quincy
Presenters: **Vitas Diktanas**, Christopher Gregory, Gregory Henry, Kevin Munoz, and Omar Odeh

At $10,000 per pound of payload, space travel is limited by the amount of weight able to be launched. Prepackaged rations are relatively heavy and lose their nutritional value over time. Long-term space missions will greatly benefit from the ability to produce nutritious food on demand. The challenge is how to successfully grow in the microgravity of space. Gravity influences the physics of everyday life, and its absence creates unique complications that can have adverse effects on plant development. This project details the construction of an automated system capable of growing radishes from seeds to microgreens in any gravitational environment. A rotating internal chamber demonstrates the ideal speed where water is evenly distributed along its inside circumference. The rotation produces a centrifugal force capable of mimicking or even overpowering gravitational forces. This allows for growth in any orientation. Plant yields from this system should be comparable to traditional hydroponic methods.

Engineering
Effect of Using Two Pin-Fin Structures on Bubble Growth Parameters in Nucleate Boiling
By: Roshan Rejit, Shilei Richard, Roosvelt Delius, and Mahyar Ghazvini
Faculty Mentor(s): Myeongsub Kim
Presenters: **Shilei Richards** and Roshan

Due to the increase in the use of microelectronics, thermal management has been used to cool down these devices. Boiling heat transfer is one of the most efficient methodologies in cooling. Pin-fin structures are commonly used to increase boiling heat transfer from the heated surface and have shown better performance than conventional fin-type heat sinks. This experimental project aims to compare two different types of pin-fin structures, one hollow and the other solid, in a boiling chamber. The pin-fin heat sinks show a much better heat transfer rate when compared to that on a plane surface. Also, the hollow pin-fin structure shows better heat transfer performance when compared to the other two surfaces. Different bubble growth parameters, such as bubble departure diameter and bubble growth time are thoroughly visualized and examined using high-speed imaging. The obtained experimental data are compared with models and data available in the literature.

Engineering
Integrated Camera and Control Systems for Underwater Remotely Operated Vehicles (ROVs) to Maximize Operability
By: Nicholas Ostheimer and Hudson Whitehurst
Faculty Mentor(s): Allan Phipps
Presenters: **Nicholas Ostheimer** and Hudson

Controlling an underwater remotely operated vehicle (ROV) in an environment which requires precision is difficult. An integrated control box system streaming video feed from multiple cameras to multiple monitors is necessary to improve precision operations. The mission of our project was to develop and implement an integrated ROV control system that improves visibility, maneuverability, and efficiency. This was also accomplished by creating a stereoscopic camera system that allowed both the operator and associated algorithms to distinguish depth more easily, and through the creation of autonomous programs that executed specific tasks with precision. The development of these integrated control systems for an underwater remotely operated vehicle resulted in improved maneuverability and operability.

Oral Session II, 11:15am - 12:15pm

Business, Marketing, Finance & Public Administration
CEO Compensation and Quality Outcomes: Exploring Trade-offs in US Non-Profit Hospitals
By: Maria Fernanda Garcia M, Scarlett Tischer, Neeraj Puro and Scott Feyereisen
Faculty Mentor(s): Neeraj Puro and Scott Feyereisen
Presenters: **Maria F Garcia Morillo** and Scarlett Tischer

Hospital chief executive officers (CEOs) can set the agenda for improved organizational performance. However, little is known about the link between their compensation and hospitals' quality performance. We aim to examine the association between CEO compensation and hospital quality. Our 2019 data includes 1,231 US nonprofit hospital CEOs. Utilizing linear regression, we identify hospital structural characteristics associated with CEO compensation. We then determine the degree to which a hospital's performance on financial and quality metrics were associated with CEO compensation. CEOs' mean compensation was $640,521. CEO pay was associated with the number of hospital-staffed beds overseen ($680 for each additional bed; $P < .001$), teaching status ($521,425 more at major teaching hospitals; $P < .001$), and urban location. Hospitals with high patient satisfaction compensated their CEOs $61,206 more than those with low patient satisfaction ($P = .006$). We found higher 30-day hospital-wide readmission rates and 30-day CABG hospital mortality rate associated with higher CEO compensation.

Business, Marketing, Finance & Public Administration
Amazon Prime Student Case Study: Targeting Generation Z
By: Amy He-Joa , Ariana Bukovac, Arianna Dalfonso, Bailey Warren, Brianna Jensen, Cindy Crichlow, Courtney Gesior, Dakota Hathaway, Elizabeth Mulvaney, Eunice Oghinan, Gabriella Torres, Juan Nunez, Katherine Maeda, Marcus Walker, Molly Trejo, and Natalia Kiraly
Faculty Mentor(s): Eileen Acello
Presenters: **Arianna Dalfonso**, Elizabeth Marcus, Marcus Walker, Samantha Rodriguez, and Valeria Tineo

We have developed a campaign to increase Prime Student subscriptions amongst GenZ (18-25-year-olds). We observed a recurring theme, and it was the lack of interest subscribing, mainly from freshman students, hence a SWOT Analysis was conducted to better understand the marketplace. A survey of 15 questions was created with 513 students recognizing their priorities in college. To accelerate our investigation, we interviewed over 150 people consisting of our target market Generation Z, freshman orientation leaders, and Resident Assistants (RA) to learn about issues post-

secondary students face. An online focus group of 7 students in our demographic was organized to get the opinion of 18–25-year-olds on the progress we had made and what they thought about our ad campaigns through several social media platforms. Lastly, secondary research was conducted through informational and reliable articles to guide us with recommended marketing strategies.

Music, Art, Literature, Theater, History & Philosophy
Escaping Spectacle through Animal's Eyes: Victims of Violent Voyeurism in "Literary Humanitarianism"
By: Autumn Bryan
Faculty Mentor(s): Carla Thomas and Stacey Balkan
Presenters: **Autumn Bryan**

My project analyzes the creative force of speculative fiction and its role in literary activism through an investigation of Indra Sinha's novel Animal's People, in which he voices a fictionalized song of the 1984 Union Carbide gas leak in Bhopal. Just as Sinha rejects the concept of literary humanitarianism, I deny the fatalistic approach to environmental literature and activism. Animal's People not only serves as a memento mori to the reader, but it also establishes a defense against voyeuristic journalism, achieved through Animal's Eyes (i.e., the reader). The novel comments on the duality of devastation, which envelopes both social and environmental violences. While encompassing the importance of human rights and showcasing disempowerment without disempowering, Sinha dismantles both the humanitarian and posthumanist views, denying the reader the easy satisfaction of claiming activism through literary consumption. The audience, in consuming Animal's pain, is therefore complicit in the objectification of the subject.

Music, Art, Literature, Theater, History & Philosophy
Madwomen Tell No Tales: The Feminine Neurotic as a Reclamation of Power and Complexity in the Era of the "Batshit Bitch"
By: Brooke Bailey
Faculty Mentor(s): Carla Thomas and Regis Fox
Presenters: **Brooke Bailey**

On an institutional level and within popular culture, women's neuroses have been plagued by an axiomatic degree of differential treatment. Influenced heavily by perceptions of women as the "weaker sex," depictions of their mental health have faced continuous reduction to patriarchally-approved tropes—including the beleaguered madwoman or the manic pixie dream girl. As a counterculture to these dehumanizing presumptions, more contemporary works have created what I refer to as the

"Batshit Bitch" movement: a literary revolution which seeks to reestablish complexity and dimension in its mentally ill, female characters; by allowing them to fall on all sides of the moral spectrum and occupy a barrage of nontraditional roles, women readers—particularly neurodivergent ones—are also allotted a much broader degree of self-identification and visibility within the literary world. This work will analyze the simultaneous empowerment enabled by this movement and its failure to be inclusive of narratives beyond privileged classes of neurotic women.

Music, Art, Literature, Theater, History & Philosophy
Finding Joy in Destruction: Liberation from Petroculture
By: Kayla Connors
Faculty Mentor(s): Stacey Balkan
Presenters: **Kayla Connors**

The circumstances of our reality are entangled in petrol use. As a result of this convention global warming threatens to cause long term shifts in temperature and weather patterns that will disrupt the balance of nature and the quality of life on Earth. Octavia Butler's novel Parable of the Sower places particular emphasis on nostalgia, denial, and resistance to change as significant barriers to creating new ways of being. I will examine Butler's dystopian imagining of a life post-climate catastrophe in ways that speak directly to our own world's fears surrounding environmental collapse. I will argue that the proliferation of societal fears and anxieties surrounding climate change are integral to reasons for why so many members of our society choose to ignore and even deny climate science and that the destruction of petroculture can become the joy of creating a new and more equitable world for all.

Environmental, Ecological & Marine Sciences
CO2 Capture and Storage via Seawater Based Concrete Solution: Microfluidics Approach
By: Abel Abraham, Ayush Gowda, Abhishek Ratanpara, and Myeongsub Kim
Faculty Mentor(s): Myeongsub Kim
Presenters: **Abel Abraham** and Ayush

In an effort to mitigate the effect of climate change, many implementations have been proposed for the capture and storage of carbon dioxide. Currently, amine scrubbing is a widely accepted carbon capture method along with carbon storage in geological sites. However, these methods have major drawbacks of using freshwater, toxic chemicals, and bottleneck conditions caused by slow chemical reactions. In this research, seawater-based CO_2 capture assisted by waste concrete materials is proposed as a remedy for the drawbacks of the current CO_2 capture technology. Additionally, storage of captured CO_2 in form of carbonate minerals is proposed to expedite chemical reactions.

Microfluidic experiments showed greater CO2 capture ability by seawater-based waste concrete solutions as compared to freshwater. Because of the calcium-oxide content in concrete, calcium carbonate precipitation has been observed as a benign byproduct. Precipitated carbonate helps the growth of seashells and coral reefs, which can lead to enriched aqua life.

Environmental, Ecological & Marine Sciences
Sexually Dimorphic Mechanical Properties of Shark Skin
By: Joseph Alexander, Madeleine Hagood, and Marianne Porter
Faculty Mentor(s): Marianne Porter and Madeleine Hagood
Presenters: **Joseph Alexander**

Shark skin is a composite of dermal denticles and collagen fibers. Collagen fibers impact skin thickness and mechanical behavior. Shark skin shows sexual dimorphisms in structure and thickness, with females having thicker skin. We evaluated the skin structure and mechanical properties of male (N=2) and female (N=2) sharks among three species (silky, Carcharhinus falciformis; bull, Carcharhinus leucas; and bonnethead, Sphyrna tiburo). We predicted greater mechanical behavior from female skin, reflecting known structural differences. Skin structures (denticle density and collagen fiber angles) were analyzed using stereoscopic microscopy. Skin was cut into a grid of 5x5 cm squares, with each square yielding four pieces for mechanical testing in tension with an Instron E1000 at 2 mm/s-1 strain rate. We found that male skin is significantly stiffer than female skin and that silky shark skin is tougher than bonnethead and bull skin, between orientations and sexes.

Environmental, Ecological & Marine Sciences
Reproductive Output in Five Brooding Sponge Species
By: Valentina Garcia-Nunes and Andia Chaves Fonnegra
Faculty Mentor(s): Andia Chaves Fonnegra
Presenters: **Valentina Garcia-Nunes**

To conserve marine sponges, we must understand their reproductive output. Previous studies suggest that not all individuals are active during each reproductive event. The purpose of this study is to quantify the population reproductive output in five brooding sponge species; Haliclona caerulea, Mycale angulosa, Niphates erecta, Spongia sp., and Tedania ignis, off the coast of Florida, USA. Larvae traps were deployed on individuals of Spongia sp. off Summerland Key during the full moon of July 2021, and on H. caerulea, M. angulosa, N. erecta, and T. ignis off the Fort Pierce City Marina during the full moons of August and September 2021. We quantified the number of larvae and individuals releasing larvae during reproductive events sampled. Daily larvae release during a full-moon

event is asynchronous across sponge populations. These results help assess which species are most viable for larvae collection efforts to support a sponge nursery for conservation purposes.

Poster/Visual Arts Presentations

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

Poster – morning
Basic Sciences
1. An Analysis Of Mitochondrial Distribution Across Neuron Types In C.elegans
By: Reggie Joseph, Danielle V. Riboul, Kerdes Joseph, Carlos Olivia, Maria Restifo, David Hall, Ken Nguyen, and Gregory Macleod
Faculty Mentor(s): Gregory Macleod
Presenters**: Reggie Joseph**

Parkinson's disease is known to have a greater impact on dopaminergic neurons when compared with other neurons. Dopaminergic neurons regulate muscle movement and coordination, and mitochondria supply the energy needed for that function in the form of ATP. Along with ATP production, mitochondria play an essential role in various other cell processes, and it is quite plausible that neurons of different functional and neurotransmitter types have different dependencies on mitochondria. To further investigate this possibility, mitochondrial distribution was analyzed in different neuron types in electron micrographs of Caenorhabditis elegans. Mitochondria were longest (1.65 ± 0.12 μm) in cholinergic interneurons, and shortest in GABAergic motor neurons (0.86 ± 0.11 μm). Glutamatergic sensory neurons had the greatest mitochondrial density ($7.8\pm1.2\%$), and vulval muscle motor neurons had the lowest ($3.6\pm0.3\%$). Understanding mitochondrial distribution will foster a deeper understanding of mechanisms neurons use to regulate mitochondria, better equipping us for the treatment of disorders with mitochondrial pathology.

Poster - afternoon
Basic Sciences
2. Finite Distributive Lattice Structures
By: Lauren Culligan, Albert Madinya, and Papiya Bhattacharjee
Faculty Mentor(s): Papiya Bhattacharjee
Presenters**: Lauren Culligan**

Lattice Theory is a relatively new area of interest in mathematics. In the 1930s, Garrett Birkoff demonstrated the importance of lattice theory which provides a unifying framework for unrelated developments in many mathematical disciplines. In this study, the diagrams of finite distributive lattice structures will be made into diagrams of n many elements so that they may be analyzed. It is predicted that there will be certain patterns that emerge from the diagrams that are constructed. Once a sequence has been determined, the goal will be to identify exactly how these lattice structures will look like and the type of elements that will make up these structures. If possible, applications in various areas of science will be identified based on these lattice structures.

Poster - morning
Behavioral, Educational & Social Sciences
3. An efficacious university-school exam preparation for competency exams in teaching reading K-12.
By: Kayla Crawford
Faculty Mentor(s): Philomena Marinaccio
Presenters**: Kayla Crawford**

Proposal is for presentation of a pilot study that investigated a summer term literacy academy for teachers interested in earning a state reading endorsement through passing a state exam or earning credits required for reading certification. This university-school collaborative research effort will bring together preservice and practicing elementary teachers from three large school districts located in the southeast United States. Preliminary data from a pilot study was not analyzed due to the low response from teachers due to the imporper timing of the release of the survey and intervention. An additional pilot study will be administered at a later date. Data will be gathered through a Self-Efficacy Teacher Reflection Survey following an online interactive lecture intervention. This researcher hopes to find improved teacher attitudes and increased self-efficacy towards earning the FLDOE reading endorsement.

Poster - afternoon
Behavioral, Educational & Social Sciences
4. Culture of Fear
By: Alisha Motiwala
Faculty Mentor(s): Monica Escaleras and Eric Levy
Presenters**: Alisha Motiwala**

The culture of fear, a theory presented by Frank Furedi, states that emotional bias is utilized to instigate fear in the general populace to accomplish political or workplace objectives. The purpose of the current study is to investigate whether authority figures instill fear in subordinates to generate conformity. To simulate the dynamic between authority figures and subordinates, a survey was designed to examine whether teacher-student interactions made students feel positive or negative overall. The data was collected through Amazon Mechanical Turk. Although the majority of respondents displayed positive teacher-student interactions, a large percentage of respondents displayed being fearful or anxious around a teacher in their school. Interestingly, the majority of respondents reported their race as White or Caucasian. Further research should be conducted to examine the role of race and ethnicity in conformity. Specifically, whether authority figures instill additional fear in racial and ethnic minorities to provoke conformity.

Poster - morning
Business, Marketing, Finance & Public Administration
5. Online Shopping Trends Since the Onset of the Covid-19 Pandemic
By: Erin Spiropoulos
Faculty Mentor(s): Monica Escaleras and Eric Levy
Presenters**: Erin Spiropoulos**

In March of 2020, the COVID pandemic began. The pandemic affected all industries, businesses, and individuals. Due to government mandates, businesses closed temporarily, and the majority of Americans were required to stay home. Shopping for any item required more creativity. Therefore, individuals had to find new ways to do their everyday shopping. The purpose of my study was to examine people's online shopping trends before and after the COVID pandemic. To analyze the relationship between people's shopping trends, I administered a survey of thirteen questions to individuals residing in the United States to see how their shopping trends have evolved over the past year due to COVID. I found that, overall, people will continue to shop online once the pandemic ends. Furthermore, there is a difference between individuals' online shopping trends during the pandemic and their online shopping trends after the pandemic ends.

Poster - afternoon
Business, Marketing, Finance & Public Administration
6. Potential Harm of Digital vs Physical Monopolies
By: Jacob Labkovski
Faculty Mentor(s): Monica Escaleras and Eric Levy
Presenters**: Jacob Labkovski**

In the past few decades, normal life has become increasingly digitized. Internet Access has become a necessity for various industries, and Social Media has become a daily ritual for many. To observe Americans' beliefs on regulation on the newly founded internet economy, this study electronically surveyed respondents about beliefs regarding the regulation of the Internet and information found on it. The respondents were adults located in the United States surveyed through Amazon Mechanical Turk. The paper hypothesizes that younger demographics will largely view digital monopolies as more economically harmful than physical monopolies. The hope is that these results will allow policymakers and independent companies to make more informed decisions about the regulation and protection of users and information on the Internet.

Poster - morning
Basic Sciences
7. The Mechanisms of Drosophila E3-ligase Mahogunin Ring Finger 1 (dMgrn1) Under Cellular Stress Induced by Intrinsic and Extrinsic Cues.
By: Wayne Robinson, Brianne Jacquet-Cribe, Nicholas Pizzo, and Tanja Godenschwege
Faculty Mentor(s): Tanja Godenschwege
Presenters**: Wayne Robinson**

The loss of functions of the vertebrate homologs of Drosophila transmembrane protein Distracted (Dsd) or E3-ligase Mahogunin Ring Finger 1 (dMgrn1) cause cellular stress and have been linked to neurodegeneration and metabolic disorders such as diabetes and obesity. Cellular stress is caused by the failure of proteins to be appropriately degraded within the cytosol of the neuron, causing them to misfold. In young neurons, vertebrate Mgrn1 is present in the cytoplasm, but cellular stress or age can cause Mgrn1's translocation to the nucleus of the cell. In the nucleus Mgrn1 promotes the function of cellular stress response genes to assist with the removal of misfolded proteins. This process allows neurons to survive under stressed conditions. To further investigate mechanisms involved in dMgrn1, we will investigate if dMgrn1 will translocate to the nucleus in young neurons that were exposed to proteasome stress or other extrinsic stressors such as starvation.

Poster - afternoon
Classroom Research Project/Assignment
8. AR Baseball on the Magic Leap – Developed for Physiotherapy Patients 65 Years of Age and Older
By: Jordan Mayberry and Darion Chong
Faculty Mentor(s): Rikikumar Patel
Presenters**: Jordan Mayberry** and Darion Chong

As people age, basic daily tasks, such as reaching or bending down for an object, become increasingly difficult. Currently, people in this predicament go to traditional physiotherapy options. These options work but aren't very exciting. Our project team proposes a thrilling way to practice core movements: AR Baseball. AR Baseball is an Augmented Reality game designed around America's favorite sport. The main game consists of a pitcher who throws baseballs at the player in random or chosen directions and angles. The player's job is to catch as many as they can. The idea behind this game is to target shoulder mobility, requiring players to constantly move their shoulders around to different locations to catch baseball. This respective motion will likely translate into these movements in their everyday lives. There is also a competitive element implemented in the application: a global leaderboard. This allows for friendly competition and fun physiotherapy.

Poster - morning
Engineering
9. Multi-spectral Filters for Medical Imaging Analysis
By: Mahaasrei Ghosh, Roshni Merugu, and William Hahn
Faculty Mentor(s): William Hahn
Presenters**: Roshni Merugu** and Mahaasrei Ghosh

In this project, we are exploring the use of a conditional GAN (Generative Adversarial Network) model for the identification of bowel endometriosis and potentially other gastrointestinal conditions in endoscopy and colonoscopy image data. Using neural networks, we can train the machine to sort through and categorize data using a pseudo-multispectral color image, which allows training using a smaller amount of data compared to conventional RGB images. Endometriosis is a very common condition that is estimated to affect 8-10% of menstruating women, and up to one-third of those women have endometrial tissue in their bowel. Being able to identify this form of endometriosis from PillCam data would allow for an efficient, noninvasive diagnosis. Additionally, the scope of this project can be expanded to identify a variety of other gastrointestinal conditions, such as inflammatory diseases, celiac disease, and tumors.

Poster - morning
Environmental, Ecological & Marine Sciences
11. So You Think You Can Sing: Assessing the Function of Complex Song in Bachman's Sparrow.
By: Brandon Welty, Denitsa Kostadinova, and Rindy Anderson
Faculty Mentor(s): Rindy Anderson
Presenters**: Brandon Welty** and Denitsa Kostadinova

Communication plays a vital role in the survival and reproductive success of animals. Male Bachman's sparrows (Peucaea aestivalis) produce three distinct types of song: Primary song, Whisper song, and Complex song. Complex songs are much longer in duration and much more acoustically variable and complex than the other categories of song. However, the intended receiver of these vocal signals, and their social function as a communication signal, are not known. In this study we will examine the behavioral responses of 15 male Bachman's sparrows to playback stimuli of Complex, Primary, and Whisper songs. We hypothesize that Complex songs contain information about a singer's resource holding potential. We predict that the most elaborate Complex songs (longer duration, more variable composition) will be produced by male birds that are larger and stronger. Data collection and analysis are in progress and experimental results are expected in July 2022.

Poster - afternoon
Environmental, Ecological & Marine Sciences
12. Investigating the Interaction Between the South Florida Gopher Tortoise and Green Iguana
By: Luis Carrillo, John Kleopoulos, Shanay Thompson, Lauren Melanson, and Evelyn Frazier
Faculty Mentor(s): Evelyn Frazier
Presenters**: Luis Carrillo** and John Kleopoulos

The gopher tortoise (Gopherus polyphemus) is a diurnal keystone species native to the southeastern United States. The green iguana (Iguana iguana) population has increased in Florida and these invasive species have impacted native species. This study investigates the behavioral interactions between the gopher tortoise and green iguanas, as they utilize burrows at the FAU preserve. Data was collected from December of 2020 to November of 2021 to include the mating seasons of these species to observe territorial behavior. Three game cameras were placed on the burrow apron 1 meter from the entrance. The camera data was filtered to remove images without these target species, and the remaining photos were entered in an excel spreadsheet. We investigated whether green iguana presence elicited a territorial response from the gopher tortoise. This study aims at producing information on the interactions between these species to aid in improved management practices for the green iguana.

Poster - morning
Health & Medical Sciences
13. Mossy Fiber Bouton Analysis of Adult-Born Granule Cells in a Vertebrate Model of Spontaneous Epilepsy
By: Vanessa Stubbs, Sebastien Nicolas, and Ceylan Isgor
Faculty Mentor(s): Ceylan Isgor
Presenters**: Vanessa Stubbs**

The occurrence of seizures in young adulthood may be related to the development of spontaneous adult-onset epilepsy, a disorder in which there is no known cause. We surveyed the hippocampus, which contains a dentate gyrus (DG) and cornu ammonis (CA) area, where DG granule neurons can undergo continuous proliferation and maturation well into adulthood. The axons of these cells, mossy fibers (MF), synapse with the dendrites of the pyramidal cells in the CA3 region, forming large intricate terminals known as boutons. Excess of the brain-derived neurotrophic factor (BDNF) in the local circuits can alter the developmental course of adult-born granule neurons. Our novel transgenic mouse model, termed TgBDNF, was found to overexpress BDNF and be susceptible to seizures. By utilizing a mouse model that can spontaneously convulse and the analysis of immature granule neurons, our research is able to link their formation/maturation to the development of seizures in young adulthood.

Poster - afternoon
Health & Medical Sciences
14. Potential Role of Subventricular Zone Neurogenesis in the Treatment of Alzheimer's Disease
By: Parsa Sartipi, Hailee Sontag, Subash Bhandari, Howard Prentice, and Jang-Yen Wu
Faculty Mentor(s): Jang-Yen Wu and Howard Prentice
Presenters**: Parsa Sartipi**

The discovery of neurogenesis has opened novel potential treatment options for neurodegenerative diseases such as Alzheimer's Disease (AD). New neurons of the subventricular zone (SVZ) contribute to optimal olfactory circuit formation in rodents via the rostral migratory stream (RMS). A similar proliferation of the stem cells in the SVZ is seen in humans. We hypothesize that the new neurons of the SVZ migrate to different brain regions. Further research in rodents has shown new neurons in other brain regions, such as the striatum, but the origin of these neurons has not been established. There is some evidence that these neurons potentially arise from SVZ. However, a number of studies indicate that neuronal precursors can be found in several brain regions including hypothalamus and

striatum. This project aims to determine the presence of neurogenesis at the SVZ in the AD mice model.

Poster - morning
Music, Art, Literature, Theater, History & Philosophy
15. Irish Choral Music: New Editions
By: Sophia Gonzalez
Faculty Mentor(s): Stacie Rossow
Presenters**: Sophia Gonzalez**

For years after Irish Independence, in 1918 the Irish government encouraged a renaissance of Irish language and traditional music. A number of composers rose to the challenge and created part-songs for children to facilitate the learning of both. Composers such as Carl Hardebec and Eamon Ó'Gallaghair composed or arranged a great number of tunes for treble voices between 1920-1950. Sadly, those scores have gone out of circulation and publication and are currently only available through library archives for study. Today, choral conductors across the United States use similar part songs from different countries to teach children both musical and cultural lessons. Sadly, there are currently very few available in the Irish language that are accessible to younger voices. The availability of these songs, in modern notation and language would greatly enhance the ability to represent the Irish tradition in school curriculums.

Poster - afternoon
Basic Sciences
16. Development and Optimization of Giant Unilamellar Vesicle Protocol to Study the Properties of Fluorescent Lipid Analogs
By: Charles Kean, Genesis Fernandez, and Maciej Stawikowski
Faculty Mentor(s): Maciej Stawikowski
Presenters**: Charles Kean**

The development of membrane sensors and lipid analogs require a controlled and convenient bilayer membrane model to study them. Due to the constant shifting in membrane conditions in live cells it is challenging to study the behavior of new molecules in such conditions. Giant unilamellar vesicles (GUVs) represent a good membrane model system used to study membrane dynamics and properties of fluorescent lipid analogs. Here we report the development and optimization of GUV preparation protocol as well as the application of GUVs to investigate the partitioning of several fluorescent lipid probes between the liquid ordered and liquid disordered membrane domains.

Poster - morning
Basic Sciences
17. The Synthesis of Protected Sialic Acid Donor Analogs
By: Andrew Whyte Jr, Ivet Boneva, Ramya Ayyalasomayajula, and Mare Cudic
Faculty Mentor(s): Mare Cudic
Presenters**: Andrew Whyte Jr**

The presence of incomplete or truncated glycan structures, commonly known as tumor-associated carbohydrate antigens (TACAs) can be capped by sialic acid and play key roles in tumor initiation, progression, and metastasis. The sialyl-Tn (sTn), containing a sialic acid α-2,6 linked to GalNAc α-O-Ser/Thr is often overexpressed when aberrant glycosylation pathways in cancer cells are activated, and is linked to poor prognosis in cancer patients. Our objective was to synthesize suitably protected sialic acid donor analogs for use in the synthesis of the sTn-derived glycosyl amino acids. The first step was the protection of the carboxylic acid group of sialic acid with methyl ester, followed by the acetylation of the hydroxyl groups. The final step involved selective activation of the anomeric center with thiophenol substitution, resulting in the desired product, phenyl-β-1-thiogalactoside. The total yield over the three steps was 53%. The final product was characterized by 1H and 13C NMR spectroscopy.

Poster - afternoon
Basic Sciences
18. Using AI to Investigate the Distribution of Mitochondria in Drosophila Neurons
By: Laura Martinez, Danielle Riboul, David Hall, Ken Nguyen, and Gregory Macleod
Faculty Mentor(s): Gregory Macleod
Presenters**: Laura Martinez**

This study seeks to determine the volume and distribution of mitochondria along the length of motor and sensory neurons in Drosophila 3rd instar larvae. Such data has the potential to reveal mechanisms that control mitochondria and provide an insight into the links between mitochondrial dysfunction and neurodegenerative diseases. With the help of the Max Planck electron microscopy core, we obtained micrographs of serially sectioned Drosophila (fruit fly) brain and peripheral nervous system. However, the amount of detail in these images is overwhelming and so we explored the use of artificial intelligence (AI) to automate steps in the analysis. Specifically, we adopted the Dragonfly ORS software platform. By training this AI to recognize neurons and mitochondria we are now able to process a far greater number of images. This in turn provides large sets of numerical data that might be interrogated to reveal phenomena otherwise overlooked in smaller data sets.

Poster - morning

Behavioral, Educational & Social Sciences

19. Common Political Beliefs Create Shared Reality and Meaning in Life

By: Claire Keane, Sofia Azcurra, and Jordan Thompson

Faculty Mentor(s): Geoffrey Wetherell

Presenters**: Claire Keane** and Sofia Azcurra

Political identification relates to a sense of shared reality– common moral and political attitudes shared among political group members. People seek a sense of shared reality to provide existential and epistemic meaning. Moral convictions which represent a sense of right or wrong may imbue shared realities with meaning. We expected strong collective political identification, shared reality within a political group, and a sense of moral conviction about shared political beliefs to predict a greater sense of meaning from shared political beliefs. 361 psychology undergraduate students completed a survey measuring collective political identification, shared reality within a political group, moral conviction, and existential and epistemic meaning garnered from shared political beliefs. The hypotheses were mostly supported; shared reality and moral conviction significantly predicted meaning in life from shared beliefs, but collective political identification did not. This suggests that shared political beliefs and moral convictions create a sense of meaning in life.

Poster - afternoon

Behavioral, Educational & Social Sciences

20. Facets of Authoritarianism Predict Support for Subverting Democracy to Remove Unrepresentative Ingroup Politicians

By: Sofia Azcurra, Claire Keane, and Jordan Thompson

Faculty Mentor(s): Geoffrey Wetherell

Presenters**: Sofia Azcurra** and Claire Keane

Individuals high in Right Wing Authoritarianism (RWA) tend to be socially conservative and high in prejudice towards marginalized groups while those high in Left Wing Authoritarianism (LWA) prefer overthrowing traditional societal structures. We hypothesized authoritarianism would predict endorsement of democracy subversion to remove poor ingroup representatives. We hypothesized RWA facets: conventionalism, authoritarian submission, and authoritarian aggression would all be predictors of democracy subversion. For LWA, we predicted anti-hierarchical aggression and anti-conventionalism would be better predictors of democracy subversion than top-down censorship. 314 psychology undergraduate students completed a survey, measuring political identification, RWA, LWA, and willingness to subvert democracy. The hypotheses were partially supported; results showed conventionalism was the most predictive RWA facet. Anti-hierarchical aggression and top-down

censorship were the most predictive LWA facets (top-down censorship was a negative predictor). These findings can help identify traits that pose a threat to the democratic system.

Poster - morning
Engineering
21. Biomimetic Autonomous Underwater Vehicle with Surface Object Tracking Capability
By: David Gonzalez, Andres Guerrero, Ivan Kuznetsov, Felipe Mendes, Brandon Mundarain, and Hannah Whitney
Faculty Mentor(s): Pierre-Philippe Beaujean
Presenters**: Brandon Mundarain**, Hannah Whitney, Andres Guerrero, David Gonzalez, Ivan Kuznetsov, and Felipe Mendes

AUVs have provided a new frontier for underwater robotic applications such as scientific ocean research and furthering military applications. One such application of an AUV is to protect personnel from potential threats through underwater detection of foreign entities. Additionally, bio-inspired AUVs are more recently being considered because of how efficiently marine life can travel through different underwater environments. This project showcases the design, analysis, and construction of a biomimetic AUV with the ability to detect, track, and follow a surface moving object, as well as obtain video surveillance. Fundamentally different design concepts were considered. Through thorough research and concept comparison using trade studies and physical calculations, the design concept best suited to meet the project requirements was a squid-inspired AUV, nicknamed the Robo-Squid. This design mimics the propulsion of a squid with a pulsating water pump mechanism that allows the AUV to turn as well as move horizontally.

Poster - afternoon
Business, Marketing, Finance & Public Administration
22. Future of Entertainment and Movies
By: Christiaan Lecky
Faculty Mentor(s): Monica Escaleras and Eric Levy
Presenters**: Christiaan Lecky**

Entertainment has been with us ever since mankind figured out how to communicate ideas, stories, and events by using words, images, sounds, or gestures. From caveman paintings, Greek epic poems, Roman gladiatorial games to opera, novels, and first moving images, people had always found a way to entertain themselves and others. By the twenty-first century, 3D movies and streaming platforms have advanced entertainment to new heights and TV shows dominated television. Due to the COVID-19

pandemic, new releases were postponed or moved to streaming platforms and most of the movie theaters were closed down. Is the future of entertainment changed forever? Will streaming platforms replace movie theaters? Will we see more streaming platforms in the future? The purpose of my study is to analyze Americans' views on the future of these media and how the COVID-19 pandemic has impacted the entertainment industry going forward.

Poster - morning
Business, Marketing, Finance & Public Administration
23. Money Matters in K-12 Education
By: Elianny Garcia
Faculty Mentor(s): Monica Escaleras and Eric Levy
Presenters**: Elianny Garcia**

Living in the 21st century, the finance industry is drastically evolving as we keep moving into FinTech. According to one of Harvard's Business case studies, ever since the Great Recession, many generation z and millennials have researched about personal finance for their own benefit and safety net. As individuals become more independent, it's crucial to have knowledge on managing finances. The objective of this survey is to determine whether Americans believe financial literacy is indeed important. This resulted with a motive of finding whether students should be taught about personal finance from grades K-12. A survey was designed to analyze the financial literacy for American adults and receive their opinions on personal finance through Amazon Turk. In my results, no one strongly disagreed that personal finance should be taught in grades K-12. In summary, my project supports the idea of a potential implementation for K-12 education about personal financial success.

Poster - afternoon
Classroom Research Project/Assignment
24. Investigating the Dynamics of Vimentin & Actin in Huntington's Disease through the application of Fluorescent Recovery After Photobleaching
By: Jacklyn Pinedo and Jianning Wei
Faculty Mentor(s): Jianning Wei
Presenters**: Jacklyn Pinedo**

Huntington's disease (HD) is an inherited gene; a mutant of Htt which causes this fatal-rare, progressive, neurodegenerative disorder. The understanding of Huntington's disease is still unclear as there is not much research on the sets of the disease. Vimentin and Actin are important filament components responsible for cytoskeleton structure. This study uses the application of Fluorescent

Recovery After Photobleaching to observe the differences between Vimentin and Actin to determine how mutant htt affects their cytoskeleton dynamic functions. Actin with mutant htt will become unstable leading to less fluorescence recovery (cytoskeleton dynamic functions severely affected) when subjected to Fluorescent Photobleaching compared to Vimentin with mutant htt. By conducting this research, we will make progress in establishing the overall difference between the molecular functions of normal (wild type) htt and mutant htt.

Poster - morning
Engineering
25. Optimize the Refueling Gas Station Locations in Post-Evacuation Conditions
By: Vasileios Liatsos, Mackenzie Mannarino, Mihalis Golias, Evangelos Kaisar, John Hourdos, and Sabyasachee Mishra
Faculty Mentor(s): Evangelos Kaisar
Presenters**: Mackenzie Mannarino**

Past disasters portray the destructive potential of natural hazards and the long-term societal disruptions that affect impacted communities and their surroundings. Therefore, preparedness of indirect and direct releases of natural hazards and risks that communities face is necessary for recovery. The directed refueling process of gas stations is a problem that's been heavily focused on due to the increasing complexity and importance for numerous years. The leading concern for the petroleum supply chain during a natural hazard, is its ability to adjust to the increase in fuel demand prior and following an evacuation. This research targets the process of fuel distribution following a natural disaster while considering the variance in supply chain during that time. An integrated model is proposed to manage a combination of the Gas Station Replenishment Problem (GSRP) and the Multi-Compartment Vehicle Routing Problem (MCVRP), however altering the objective function, assumptions, and constraints to the post-evacuation conditions.

Poster - afternoon
Engineering
26. Torsion Force Detection Using A Soft Magnetic Sensor Array
By: Lucja Stawikowska, Rishav Goolcharan, and Erik Engeberg
Faculty Mentor(s): Erik Engeberg
Presenters**: Lucja Stawikowska**

Prosthetics help those who suffer from the loss of a limb. Currently, hand prosthetics do not provide adequate sensing capabilities compared to a human limb. To mimic touch response, sensors must be

integrated into prosthetic devices. Despite the many sensor types available, flexible tactile sensors generally perform best with prosthetics, since they allow for stretching without damage to the sensor. This study aims to determine whether a soft magnetic sensor array can detect and classify torsion forces (twisting). The sensor is designed to detect variation in magnetic field, generated when various forces are applied to its skin. The prototype is currently able to detect and classify direct pressure at varying locations, but its ability to detect torsion is yet unknown. If expected results are obtained, the sensor can be integrated into a prosthetic hand prototype, along with haptic user feedback, to allow the sensing of direct pressure and torsion.

Poster - morning
Environmental, Ecological & Marine Sciences
27. Microsatellite Assessment of South Florida's Gopher Tortoise Population
By: Rachel Starck, Luis Carrillo, Olivia Rothberg, Colin Hughes, and Evelyn Frazier
Faculty Mentor(s): Colin Hughes and Evelyn Frazier
Presenters**: Rachel Starck** and Luis Carrillo

Gopher tortoises (Gopherus polyphemus) are important ecosystem engineers but are threatened by urbanization and habitat fragmentation and are now actively managed. FWC range maps do not include south Florida, so the genetic uniqueness of these populations is unstudied. We will examine the genetic composition of these populations using nine microsatellite loci. We hypothesize that the populations contain high genetic diversity since they are descendants of the refugium population of the last glacial maximum. DNA will be extracted from blood samples collected at Jupiter Abacoa preserve, the Boca Raton FAU preserve, and from Zoo Miami using Qiagen DNeasy Blood & Tissue Kit. We will amplify the microsatellite loci and send the products to University of Arizona's core genetics facility for size-determination. The products will be analyzed using publicly available software. Since gopher tortoises play an important role as ecosystem engineers, we hope this study will help management and long-term survival.

Poster - afternoon
Environmental, Ecological & Marine Sciences
28. Prevalence and Detection of Legionella Species in Potable Water Using the CDC Gold Standard & qPCR
By: Lauren Sankar, Arthi Khan, and Nwadiuto Esiobu
Faculty Mentor(s): Nwadiuto Esiobu
Presenters**: Lauren Sankar** and Arthi Khan

Legionella is a fastidious bacterium found in water systems that causes Legionnaires' disease and Pontiac fever. Legionella pneumophila is spread by the inhalation & aspiration of aerosolized bacteria. Most city labs in South Florida cannot detect Legionella pneumophila because of the stringent culture requirements. We employed the standard CDC Elite culture protocol to determine the prevalence of legionella in ten samples collected from Florida Atlantic University, and developed a molecular assay based on quantitative PCR (qPCR) techniques to detect most Legionella species in one step targeting familiar L. pneumophila with specific primers (Lmip1 and Lmip2 in 16s rRNA). The arrangement and validation of these primers were confirmed through NCBI primer BLAST software. Due to increasing outbreaks within the public health, early and rapid detection of L. pneumophila can prevent immunocompromised residents from potential death. Further, the broad primer targets would highlight occurrences of less known legionellae while easing detection methods.

Poster - morning
Health & Medical Sciences
29. Conformation and Proteolytic Analysis of APP Model Glycopeptides
By: Gustavo Mundim, YashoNandini Singh, Ramya Ayyalasomayajula, Nancy Vela, Dmitriy Minond, and Mare Cudic
Faculty Mentor(s): Mare Cudic
Presenters**: Gustavo Mundim**

The β-amyloid precursor protein (APP) has been extensively used in studies regarding Alzheimer's Disease (AD) considering it undergoes proteolytic cleavage by α-, β-, and γ-secretases. While β-secretase causes a sequential cleavage, thus liberating the neurotoxic amyloid β-protein (Aβ), α-secretase prevents its generation cleaving within the amyloid domain. It had been previously reported that Tyr-681-O-glycosylation and the Swedish Mutation supports the amyloidogenic pathway since β-secretase activity increased compared to α-secretase. To further our studies, APP fragments carrying O-glycosylated sites at Thr663 and Ser667 along with their respective non-glycosylated analogues have been synthesized to expand on the role of glycosylation on conformation and proteolytic processing. It has been concluded that the level of β-secretase activity significantly increased in the glycopeptides with the Swedish mutation in comparison to their native and nonglycosylated counterparts. Moreover, data shows conformation heavily depends on internal conditions (O-glycosylation and Swedish mutation) and external (buffer ions and solvent polarities).

Poster - afternoon
Health & Medical Sciences
30. Sulindac and Carbamathione as Potential Therapeutic Interventions for Alzheimer's Disease
By: Daniel Gerguis, Michael Amin, Anthony Dawod, Howard Prentice, and Jang-Yen Wu
Faculty Mentor(s): Howard Prentice and Jang-Yen Wu
Presenters**: Anthony Dawod**, Michael Amin and Daniel Gerguis

Alzheimer's disease is a neurodegenerative disorder that predominantly affects senior citizens causing the eradication of memory and thinking skills. Early signs of Alzheimer's cause damage to the hippocampus and entorhinal cortex. Current FDA-approved medications such as donepezil, rivastigmine, and galantamine can help mitigate the effects of mild Alzheimer's symptoms and regulate neurotransmitters; however, those medications do not completely cure the disease. Furthermore, neurodegenerative diseases are implicated with neuronal over-excitation via glutamate receptors in addition to oxidative stress and calcium overload. Sulindac, a non-steroidal anti-inflammatory medication, contributes to decreasing oxidative stress and induces pro-survival signaling in models of tissue ischemia and neuronal overexcitation. Carbamathione, a glutamate receptor partial antagonist, is protective against excitotoxicity through downregulating ER stress and mitochondrial stress. The current studies address the effects on maintaining neuronal cell viability and examine the mechanisms of Carbamathione and Sulindac-mediated neuroprotection using disease models of neuronal excitotoxicity.

Poster - morning
Basic Sciences
31. Model Selection for HIV and Nutrition Dynamics
By: Vivek Sreejithkumar, Kia Ghods, and Necibe Tuncer
Faculty Mentor(s): Necibe Tuncer
Presenters**: Kia Ghods** and Vivek Sreejithkumar

Human immunodeficiency virus (HIV) is a serious public health concern. Although previous research demonstrates proper nutrition as an early intervention for HIV, there is a gap in the literature regarding a model to quantify this relationship between nutrition and HIV immune response. This research uses mathematical modeling to map the within-host dynamics of nutrition and HIV. The models are a system of ordinary differential equations, and model selection is conducted to determine the best model. The MATLAB software was used to fit the models to data acquired from a previous study on simian immunodeficiency virus (SIV) in 12 rhesus monkeys (Vaidya et. al., 2016). Model parameters can be estimated with the fminsearchbnd function on MATLAB. The AIC (Akaine

Information Criteria) is used to determine the best model to represent the data. The results show that the simplest model, with the least parameters, was the best model (AIC score of -337.622).

Poster - afternoon
Basic Sciences
32. Method of Endogenous Tagging In The Retina Using CRISPR - CAS9
By: Chuanping Zhou, Yuchen Wang, Yan Cao, Noor Ibrahim, and Kirill Martemyanov
Faculty Mentor(s): Terica Meredith and Kirill Martemyanov
Presenters**: Noor Ibrahim**

Immunohistochemistry (IHC) is an imaging method commonly used to check for specific antigens in biological research. This process is very time-consuming and resource-heavy as specific antibodies need to be manufactured for each point of interest. CRISPR models have been made to help streamline IHC in the brain by inserting premade gene segments into specific parts of the genome to create a knock-in. However, these processes have not yet been expanded to the retina. This study aims to develop a method of imaging to streamline IHC in the retina. Through the use of in vivo electroporation in neonatal mice and custom CRISPR guide RNA and donor DNA, the project strives to develop an alternative method of imaging the retina using IHC, that only needs one type of antibody to image a plethora of points of interest.

Poster - morning
Behavioral, Educational & Social Sciences
33. Online Looking vs. In-Person Looking
By: Ataliaha Blake, Victoria Ronderos, Jacqueline Stotler, and Teresa Wilcox
Faculty Mentor(s): Teresa Wilcox
Presenters**: Ataliaha Blake**

In response to the COVID-19 pandemic, developmental psychology studies have transitioned from in-person to online. Online research has its distinct benefits and limitations. Prior research indicates while infants' visual preferences can be successfully measured using online tools, the quality of data obtained can vary (Nelson & Oakes, 2021). The current study investigated the feasibility of online platforms, such as Zoom, to conduct developmental research studies. We predicted that the quality of webcam-looking time data would be similar to that of in-person data. Data were collected via the Zoom platform. Using a previously established preferential looking paradigm, infants aged from 6 to 24 months were shown a series of YouTube videos, with either a robot hand or human hand, to determine whether they can distinguish between "automated movements" and "human movements."

Results from the ANOVA analyses will be presented and insight on infants' discrimination of robots will be discussed.

Poster - afternoon
Behavioral, Educational & Social Sciences
34. Perceptions of Posttraumatic Growth Among Adults With Lived Experience In Foster Care
By: Morgan E. Cooley, Robin Jimenez-Bean, Heather M. Thompson, and Marianna Colvin
Faculty Mentor(s): Morgan Cooley
Presenters**: Robin Jimenez-Bean**

Adults with lived experience in foster care (LEFC) often endure challenges over the course of their life due to their prior life experiences and continued limits in accessing different types of resources or support. Despite their obstacles, adults with LEFC may also thrive as a consequence of their adversity and trauma resulting in personal growth, healing, and transformation. Substantial posttraumatic growth research exists; however, there have been limited applications of this concept to the experiences of those with LEFC. This qualitative research utilized focus groups to examine the experiences and perceptions of PTG among adults enrolled in college with LEFC. Implications for future research, practice, and academic programming or other types of supports will be discussed.

Poster - morning
Business, Marketing, Finance & Public Administration
35. Americans Views on Reliance of Foreign Goods
By: Christian Fronteddu
Faculty Mentor(s): Monica Escaleras
Presenters**: Christian Fronteddu**

The covid-19 pandemic has had wide ranging effects on the economy of the United States and the consuming habits of Americans. The ripple effects caused by the onset of the pandemic have shown glaring weaknesses in the United States reliance on importing goods and the interconnectedness of the global economy. As the Covid pandemic winds down it is important to re-examine the state of America's economy and Americans' public sentiment towards the changing state of our economy. The purpose of my research is to examine American's concerns, if any, in regard to America's reliance on importing goods and their consuming habits and preferences when making purchases and their reasoning.

Poster - afternoon
Engineering
36. Evaluation of Failure Mechanics for Solar Car Sandwich Composites
By: Polina Sabitova and Ruby Aubin
Faculty Mentor(s): Marianne Porter
Presenters**: Polina Sabitova** and Ruby Aubin

The composite material industry focuses on developing material sandwiches that combine the strength, stiffness, and lightweight qualities of various materials into a single unit. The goal of this research was to conduct additional testing on the integrities and durabilities of carbon fiber composite sandwiches for their utilization in a solar car body and to use the data for future research comparison. The solar body's purpose is to aid in optimizing the vehicle's performance while simultaneously prioritizing passenger safety. Using heavy common car body metals for the car would significantly decrease the vehicle's velocity and reduce performance. 48, 2"x 6" by 0.75" thick pre-ordered carbon fiber composites with foam and honeycomb aluminum cores were tested using compression-load bearing systems. This data creates the baseline comparison for our next steps in constructing carbon fiber composites in the Cane Institute of Advanced Technologies using wet vacuum bag sequential infusion methods.

Poster - morning
Environmental, Ecological & Marine Sciences
37. Inlet-adjacent Beach and Shoreline Variability at Decadal Scales
By: Teagan Duenkel, Duncan Clark, and Tiffany Roberts Briggs
Faculty Mentor(s): Tiffany Roberts Briggs
Presenters**: Teagan Duenkel** and Duncan Clark

Healthy beaches are essential for storm protection, habitat provision, and economic support. However, with sea-level rise, coastal construction, and intensifying storms, coastal erosion is prevalent and requires informed mitigation and management strategies. This study evaluates decadal-scale trends in morphology change and shoreline variability of inlet-adjacent beaches in Jupiter, Florida. Data from six locations over a period of four decades were analyzed to determine volumetric and contour changes above the shoreline (0 m elevation) and across the entire profile. The largest variability in decadal morphology change was measured at beaches closest to Jupiter Inlet. Substantial shoreline and beach changes were also associated with periods of higher storm activity. Variability in storm events, nourishment trends, and longshore sediment transport also influenced decadal morphologic change. To best adapt to coastal change and develop comprehensive beach-inlet

management plans, it is imperative to understand past trends of shoreline variability and beach-nearshore erosion and accretion patterns.

Poster - afternoon
Environmental, Ecological & Marine Sciences
38. Straight Swimming Kinematics of Shoaling Leopard Sharks (Triakis semifasciata)
By: Charles D. Romero, Cassandra Ruddy, Andrew Nosal, and Marianne Porter
Faculty Mentor(s): Marianne Porter
Presenters**: Charles D. Romero**

Previous research has examined an offset mode of wave propagation between the yawing head and beating tail of swimming sharks. During swimming, tailbeat amplitude is larger than head yaw amplitude, but head yaw frequency is faster than tailbeat frequency. We aim to quantify straight swimming kinematics of shoaling leopard sharks (Triakis semifasciata). Due to their ability to rest at the sea floor, buccal pumping sharks may swim differently than ram ventilators. We hypothesize that leopard sharks employ an offset mode of wave propagation, resulting in different strouhal values than obligate ram ventilators, suggesting they swim less optimally. We obtained aerial video filmed in La Jolla, CA and used Logger Pro 3.16 software to motion track individuals using 5 midline anatomical landmarks. We quantified parameters including anterior/posterior amplitude/frequency, and strouhal number. Preliminary data suggests that leopard sharks employ an offset wave, similar to other sharks.

Poster - morning
Health & Medical Sciences
39. Cell Autonomous or Cell Non-Autonomous? Regulation of C. elegans Lifespan by GPCR-1
By: Leena Al-Hraki, Yarleni Suarez, Elizabeth Lieberman, and Kailiang Jia
Faculty Mentor(s): Kailiang Jia
Presenters**: Leena Al-Hraki**, Yarleni Suarez, and Elizabeth Lieberman

Caloric restriction can delay aging and increase lifespans of various species, including primates. However, the mechanisms by which food nutrients are detected are not well understood. C. elegans is a good model to dissect a signaling transduction pathway. We recently identified a G protein-coupled receptor, named GPCR-1, that is involved in the detection of food signals in C. elegans and found that mutations of this gene can extend C. elegans lifespan; presumably by reduced food signaling that mimics caloric restriction. To determine if GPCR-1 acts in chemosensory neurons to transmit food signals, we will utilize the RNAi technique to silence GPCR-1 in neuronal, intestinal, hypodermal,

and reproductive tissues. The results will ascertain if GPCR-1 functions cell autonomously or cell non-autonomously to control aging. The data is anticipated to help understand how caloric restriction affects aging in humans and discover new therapeutic targets to decelerate aging and emergence of neurodegenerative diseases.

Poster - afternoon
Health & Medical Sciences
40. The Mutual Patterning of Power and Resilience in Nurses Experiencing Nurse Coaching and HeartMath® During a Pandemic
By: Angela Siclari, Nancey E.M. France, and David Newman
Faculty Mentor(s): Nancey E.M. France
Presenters**: Angela Siclari**

Strengthening the power and resilience in nurses can help manage stress which can ultimately improve quality of patient care and promote overall wellbeing, especially during a pandemic. The purpose of this pilot study was to discover the mutual patterning profile of power and resilience in nurses experiencing Nurse Coaching and HeartMath® during a pandemic. This descriptive exploratory research study used a mixed methods design with pretest-posttest quasi-experimental and Husserlian phenomenological approaches to explore the influence of HeartMath® and Nurse Coaching on resilience and power in nurses. The results had shown that there was a significant increase in power after all sessions, especially for choices, freedom and involvement. The synthesis of unity power in caring for self to care for another emerged through and within the essential structures. This pilot study has provided evidence that during the pandemic the participants' power and resilience were strengthened through Nurse Coaching and HeartMath®.

Poster - morning
Basic Sciences
41. Evan's Blue Assay Evaluation of the KED Signaling Pathway's Possible Wound Response Function in Tomato Plants
By: Annalise Wellman, Alexander Spanoudis, Hailey Wright, Nicholas Nifakos, and Xing-Hai Zhang
Faculty Mentor(s): Xing-Hai Zhang
Presenters**: Annalise Wellman**

The KED signaling pathway found in tomato plants currently has no known function, but research suggests it is expressed in plant wounding. Evan's Blue assay is an indicator solution that gauges wounding in plant tissues. Using a prepared Evan's Blue solution allows one to evaluate a possible link

between plant healing and the expression of KED gene. In this study, control tomato plants, and KED knock-out tomato plants, were both wounded. The wounded leaf samples were suspended in Evan's Blue solution for 20 minutes. Then, the samples were placed in 2.5 ml methanol for 24 hours to remove excess chlorophyll from the tissues. Evan's blue dye was extracted from decolorized leaf samples, and its concentrations were measured. Using this method to track the possible role of KED gene expression in plants' wounding response can potentially broaden our knowledge of the KED signaling pathway and its utilization in other plant species.

Poster - afternoon
Basic Sciences
42. Interpersonal Characteristics Related to Stress Reactivity and its Relation to the Responses Towards Mindfulness-Based Meditation Interventions in Preadolescents
By: Mylinh Nguyen and Nancy Jones
Faculty Mentor(s): Nancy Jones
Presenters**: Mylinh Nguyen**

Previous research demonstrates that children's interpersonal characteristics are associated with the functioning of the hypothalamic-pituitary-adrenal (HPA) stress axis and suggests that meditation interventions efficiently reduce anxiety and stress. This current study sought to evaluate data from 2 previous studies; one testing students in grade 3, and the other testing a year later, grade 4. The first placed participants in meditation interventions and analyzed their electroencephalogram (EEG) values to test for neurophysiological changes. The second placed participants in a stressor paradigm (math quiz) to measure salivary cortisol. This study plans to evaluate those who participated in both studies to examine which students were more susceptible to the stressor paradigm to compare the results from when they participated in the meditation intervention. It is important to gain a better understanding of the interactions between interpersonal characteristics related to stress reactivity and how certain traits may appear with meditation inventions in preadolescents.

Poster - morning
Behavioral, Educational & Social Sciences
43. Effects of Anxiety and Stress on Learning
By: Emma Lilly Menzer, Aisha Bashir, David Bickham, and Terrence Barnhardt
Faculty Mentor(s): Terrence Barnhardt
Presenters**: Emma Lilly Menzer** and Aisha Bashir

Learning occurs across multiple systems, including the declarative system, involved in conscious learning, and the habit-based procedural system, used in unconscious learning. Literature suggests that anxiety and stress can impact the procedural and declarative learning systems. This study explored the relationship between participants' initial anxiety and induced emotion to study how the match (congruence) or mismatch (incongruence) between the two factors impacts declarative and procedural learning. Learning was assessed using a novel probabilistic learning task board game. Results suggest a relationship between emotion congruence and task performance. For example, highly anxious individuals in the negative emotion condition performed better on the declarative task than highly anxious individuals who underwent a positive emotion induction. The reverse was true for the procedural learning condition. This research is significant because it discerns factors that may be used in deciding effective declarative or procedural therapy strategies for individuals with anxiety disorders.

Poster - afternoon
Behavioral, Educational & Social Sciences
44. Intrinsic Drunkenness in Auto Brewery Syndrome - A Systematic Review
By: Lea Goldenberg and Lincoln Sloas
Faculty Mentor(s): Lincoln Sloas
Presenters**: Lea Goldenberg**

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

Poster - morning
Business, Marketing, Finance & Public Administration
45. New Cold War for a Great Reset
By: Victor Sardon
Faculty Mentor(s): Luis Garcia-Feijoo
Presenters**: Victor Sardon**

Russia and China have been looking for a way out from the Western financial system. Both Russia and China have been working on SWIFT alternatives since 2014—SPFS and CIPS. This could lead to the decline of the petrodollar as Russia would be able to dictate how it sells its oil and gas, while the US cannot stop Putin. Not to mention, Russia is the largest exporter of wheat globally and is in efforts to take control of Ukraine, another top exporter. This would lead to large price shocks to the global economy, especially across the futures markets of commodity sectors. This project explores the indicators that led up to these events and the indicators related to how other BRICS countries will look to keep up with any major change—whether that be shortages or inflation impacts.

Poster - afternoon
Engineering
46. Modeling Tire Efficiency: Effects of Speed, Tire Pressure, Vertical Load, Inflation Gas Type, and Tire Type on Solar Cruiser Tires
By: Mark Zagha, Buddy Trent IV, and Nathanael Lecky
Faculty Mentor(s): Allan Phipps
Presenters**: Mark Zagha**, Buddy Trent, and Nathanael Lecky

Rolling resistance plays an important role in how a car utilizes its energy. It is necessary that a solar cruiser utilize as little energy as possible. For this experiment, the scientist utilized an apparatus to hold a wheel over a treadmill to test the factors that affect rolling resistance. Due to COVID-19, scientists were only able to test the effects of pressure and speed, deeming these variables most important. The scientist found that at all speeds, an increase in pressure caused the rolling resistance to decrease, as the hypothesis predicted. The scientist also initially predicted that an increase in speed would cause an increase in rolling resistance, although the scientists found that speed affected the rolling resistance minimally. In conclusion, it is most important that the solar cruiser's tires are filled to the right pressure, and the driver should not worry about the speed affecting the rolling resistance.

Poster - morning
Environmental, Ecological & Marine Sciences
47. Why the Weird Head? Vertebral Column Variability Between Hammerhead and Requiem Sharks
By: Sonoma Arnaldy, Jamie Knaub, and Marianne Porter
Faculty Mentor(s): Marianne Porter
Presenters**: Sonoma Arnaldy**

To swim, sharks produce thrust through consistent lateral undulations using their body and caudal fins. Sphyrnidae (hammerheads) and Carcharinidae (requiem) sharks are families within order Carcharhiniformes. Hammerheads have an expanded head (cephalofoil) that yaws at a higher frequency during swimming compared to requiem sharks. Higher head yaw frequencies may stress the anterior vertebrae more in hammerhead sharks resulting in different regional morphology compared to requiem sharks. We examined the differences in vertebral morphology among two representative species from each family. Using a micro-CT scanner, we imaged vertebrae from three body regions from four species of shark (Prionace glauca, Carcharhinus obscurus, Sphyrna lewini, and Sphyrna mokarran). Using CTVox and ImageJ, we quantified the 3D morphology of anterior, middle, and posterior vertebrae representing different locations along the undulatory swimming wave. The importance of this study is to highlight the morphological variability across the order Carcharhiniformes, that may contribute to their swimming kinematics.

Poster - afternoon
Basic Sciences
48. Utilizing Facial Recognition Software to Identify Hybrid Cercopithecus Monkeys within a Five-Year Photo Collection
By: Kayla Ahlness, Cole Tucker, Connor Cane, and Kate Detwiler
Faculty Mentor(s): Kate Detwiler
Presenters**: Kayla Ahlness**, Cole Tucker, and Connor Cane

Population monitoring, group member identification and the cultivation of an accurate life history profile is crucial to document population trends for wildlife species. An experienced field researcher is capable of tracking known individuals with high success, however visiting researchers or novice field assistants are not able to reliably identify individuals. Recent studies have implemented Artificial Intelligence (AI) to automate individual identifications, thus providing researchers with a new tool to build life history profiles of wild animals. This project utilizes an AI facial recognition software to identify study individuals in a photographic collection (2015-2019) of two Cercopithecus species and their hybrids (n = 1,151 photos). We defined an identification as correct if the AI yielded 98.0-100%

accuracy score. We identified 57 unique monkeys from AI profiles (n = 61 monkeys) in the 5-year photo collection. Our results confirm the usefulness of the AI tool for monitoring individuals in the study population.

Poster - morning
Health & Medical Sciences
49. Assessment of a New Model for Chronic Fatigue Syndrome: Studies of the Viral Mimetic Poly I:C on Biochemical Measures of Brain Inflammation and Serotonin Signaling
By: Tiffany Zhang, Paula A. Gajewski-Kurdziel, Rania Katamish, Alaina Tillman, Carina Meinke, Ning Quan, and Randy D. Blakely
Faculty Mentor(s): Randy D. Blakely
Presenters**: Tiffany Zhang**

Chronic fatigue syndrome (CFS) is a debilitating, multisystem disease characterized by severe fatigue without medical explanation. Currently, there are no established diagnostic tests or FDA-approved treatments. To develop treatments and understand its etiology, we need to study valid preclinical models, which are currently lacking. Evidence shows that infection may play a role in the development of CFS and prolonged fatigue may be due to changes in central serotonin homeostasis. Thus, we aim to examine whether a viral mimetic (PIC) can trigger prolonged fatigue behavior and neuroinflammation. Three mouse strains were examined for their reaction to PIC and only CD1 mice demonstrated prolonged fatigue. Next, examination of brain tissue will reveal whether our mouse model displays similar alterations in markers of neuroinflammation and serotonin-related genes compared to the clinical CFS population. Development and optimization of this model ultimately allows for the development of treatments that target these unique pathways.

Poster - afternoon
Health & Medical Sciences
50. Examining the Effects of Service Dog Trainings on Heart Rate Variability in Veterans with Post-Traumatic Stress Disorder
By: Sydney Hardison and Cheryl Krause-Parello
Faculty Mentor(s): Cheryl Krause-Parello
Presenters**: Sydney Hardison**

Post-Traumatic Stress Disorder (PTSD) is a trauma-induced psychological ailment plaguing military Veterans. Physiological stress can be measured by heart rate variability (HRV), the variation between each heartbeat. The purpose of this study is to examine the effects of a service dog training

intervention on HRV in Veterans with PTSD. Data were collected from a randomized clinical trial. Participants were randomly assigned into two groups. The intervention group received service dog training from a professional dog trainer and interacted with dogs. The control group received parallel service dog training virtually and had no interactions with dogs. Results indicated that the intervention group experienced increases in their average HRV, while the control group did not experience an increase in HRV. The results suggest that the intervention supported improvements in a physiological stress indicator (HRV) in Veterans with PTSD. The results implicate that dog interactions decrease physiological stress and improve Veterans' biological coping.

Poster - morning
Engineering
51. ROCDOC - Remote Operated Concrete Mattress Deployer
By: Samuel Shaffer, Reilly Maguire, Anthony Zarrilli, Rachel Williams, Mathew Wolf, Kevin Axelrod, and Pierre-Philippe Beaujean
Faculty Mentor(s): Pierre-Philippe Beaujean
Presenters**: Samuel Shaffer**, Anthony Zarrilli, Rachel Williams, Matthew Wolf, Reilly Maguire, and Kevin Axelrod

Concrete mattresses are implemented to protect underwater pipelines from dropped objects, corrosion, and marine activities. In addition, they provide stabilization to pipelines in loose seafloor conditions. The mattresses used in this design will be a 1:10 scale from the standard size of 20 [ft] x 8 [ft] x 1 [ft]. The purpose of this project is to create a remote operated concrete mattress deployment frame that is capable of operating at a maximum depth of 60 feet, while using cameras and a sonar for navigation. Our design utilizes two sub-systems, the first being a stabilizing platform on the ocean surface which duels as the primary communication hub between overall system and operator. The second sub-system which is submerged will contain our propulsion mechanism, along with a payload of two concrete mattresses. Preliminary analysis has shown our system is capable of maintaining stability and structural integrity throughout the mission.

Poster - afternoon
Basic Sciences
52. Scalp and Hair Mycobiome Community Structure in Balding and Non-Balding Humans
By: Katrina Dobinda, Aziza Abdelaziz, Belén Wertheimer, Deena Davis and Nwadiuto Esiobu
Faculty Mentor(s): Nwadiuto Esiobu
Presenters**: Katrina Dobinda**

Approximately 20% of Americans experience hair loss in their adulthood with limited options of effective treatments or therapy. Fungi such as the Malassezia yeast have been closely linked with human balding. The ultimate goal of this study is to advance the understanding of the potential role that fungal communities play in balding and hair loss. Metagenomic DNA was extracted from 4 subjects (2 balding and 2 non-balding) and analyzed using next generation sequencing of ITS genes to define the mycobiome community structure of balding and non-balding scalps. Utilizing metagenomic sequencing and RFLP analysis, mycobiome diversity of extracted samples will be cross referenced to test the hypothesis that hair loss is closely linked to fungal dysbiosis. In this presentation, the overall community structure and diversity indices unique to balding will be determined and contrasted with non-balding conditions. Significance in dysbiosis would promote further research and potential targeted therapies for hair regeneration.

Poster - morning
Basic Sciences
53. Analysis of the Function of GRM-1 in Controlling Caenorhabditis elegan Life Span
By: Anthony Golka, Hannah Mendez and Kailiang Jia
Faculty Mentor(s): Kailiang Jia
Presenters**: Hannah Mendez** and Anthony Golka

Longevity enables the extension of a healthy lifespan. In accordance with the disposable soma theory of aging, a trade-off occurs in which genes deleterious to aging create a positive effect on reproduction, enforcing gene selection. This positive effect is created through signals to germline cells of an organism. However, how germline cells detect this signal is unclear. Therefore, we propose to study the function of GRM-1, a protein that could act in germlines to mediate this signal in Caenorhabditis elegans. GRM-1 is expressed in multiple tissues including germline cells and mutations of GRM-1 lead to abnormal germline cell proliferation. We will use the RNAi technique to silence GRM-1 in multiple tissues, including germline. If our hypothesis is correct, we will observe extension of lifespan when GRM-1 is silenced in germline cells but not in other tissues. This anticipated result suggests that GRM-1 may mediate germline signaling in controlling longevity.

Poster - afternoon
Behavioral, Educational & Social Sciences
54. The Role of Infant Temperament on Parental Sensitivity and Intrusiveness
By: Aishwarya Bandaru, Lindsey Riera-Gomez, and Teresa Wilcox
Faculty Mentor(s): Teresa Wilcox
Presenters**: Aishwarya Bandaru**

Previous research has shown that a mother's sensitivity is a predictor of her child's emotional regulation (Frick et al., 2017). Additionally, mothers who are more intrusive, or controlling, in response to their child's temperamental problems will have children who demonstrate more disruptive behaviors in later years (Yan et al., 2019). The purpose of this study was to investigate the association between infant temperament, or the infant's emotional expression and regulation, and parents' intrusive and sensitive behaviors. We predicted that parent reports of infant temperament would be associated with the way in which parents behave towards their infants. Forty-six parent-infant dyads participated in a 4-minute freeplay interaction. Parental sensitivity and parental intrusiveness were coded from the recorded sessions. The results demonstrate that infants high in surgency (positive emotionality) have parents that are more sensitive and less intrusive. These findings suggest that infant surgency elicits maternal responses that promote infant emotional development.

Poster - morning
Engineering
55. Bio-Inspired Self-Burying AUV
By: Alexis Base, Cauhl Cleary, Anthony Gore, Sil Schoolman, Mackenzie Smith, Juan Rios, and Pierre-Philippe Beaujean
Faculty Mentor(s): Pierre-Philippe Beaujean
Presenters**: Alexis Base**, Anthony Gore, Cauhl Cleary, Juan Rios, Mackenzie Smith, and Sil Schoonman

Autonomous underwater vehicles (AUV) are utilized to perform various marine applications from monitoring to surveying ecosystems. However, the demand for AUVs to adapt to increasingly complex problems have prompted the exploration into biomimetic AUVs. Marine organisms, such as the Stargazer and Horseshoe Crab have evolved mechanisms of self-burying for their environment. An AUV, modeled after these species, capable of burying could perform similar functions. In between missions, AUVs typically need to be retrieved out of the water, posing challenges, so it is beneficial for the vehicle to stay on the seabed until triggered for the next mission to start. To overcome this challenge, this project works to design, fabricate, and test a bio-inspired underwater vehicle with self-burying capability. An AUV capable of self-burying and sustaining a vertical load, via impeller design, could prove beneficial in applications such as extended deployment, withstanding ocean current, recovery operations, and appearing undetectable.

Poster - afternoon
Engineering
56. Federated Learning for Sustainable Microgrid Optimization
By: Samuel Gerstein and Zhen Ni
Faculty Mentor(s): Zhen Ni
Presenters**: Samuel Gerstein**

The growing use of renewable energy will have unprecedented impacts on current power systems. The volatile and decentralized nature of renewable energy generation can disrupt the grid equilibrium, forcing grid operators to rethink how they can optimize both the supply and demand of energy. Researchers have found classical machine learning algorithms to be effective in predicting the energy demand but lack an understanding of real-world constraints such as user privacy, inhibited communication, and constraints on computing infrastructure. To combat this, I propose a federated learning framework (FL) for energy demand prediction in microgrids. Federated learning uses the various clients in a microgrid system to train a model locally and aggregates the weights of each client to build a new global model. By reducing transmission through a central point of failure, this process is more robust in critical smart infrastructure. This project applies a federated learning simulation on smart home datasets.

Poster - morning
Behavioral, Educational & Social Sciences
57. Memory for Actions and Objects
By: Elizabeth Escuage, Lindsey Pugh, Alan Kersten, and Julie Earles
Faculty Mentor(s): Julie Earles
Presenters**: Elizabeth Escuage**

Binding of person (actor) and action is a process that occurs anytime we remember an event. This process is vital to correctly remember events, whether important or mundane. When an error occurs in this process, false memories can be created in the mind. Understanding how and why these errors occur is fundamental. Previous research has shown a relationship between emotions and binding persons to actions. The present study seeks to investigate whether these emotion-tied binding errors can also occur when the focus is on the object and an action, instead of the actor. Specifically, the study aims to create video stimuli of actors using objects for participants to view and then attempt to recall whether they saw the action and the object paired together. The aim of the study is to show that emotion will affect participants' ability to bind actions and objects.

Poster - afternoon
Environmental, Ecological & Marine Sciences
58. Implications of Harmful Algal Blooms [HABs] and the Nutrient Pathway in Lake Okeechobee.
By: Emaad Mirza and William Louda
Faculty Mentor(s): William Louda
Presenters**: Emaad Mirza**

Within Lake Okeechobee, a lengthy history of algae blooms has prompted the usage of mandated research on the water body to further understand the eutrophic nature of the disturbed lake. This study focuses on nutrient pathway analysis and is supported by published compositional data of the lake during HAB season. Theorized steps to help reverse the ecological damage done by HABs are calculated and revolve around anthropological containment on afflictive processes. Data analysis was done on five contrasting locations in the lake with collection done biweekly, resulting in evidence supporting the idea of phosphorus linked algae blooms. Other findings were nitrate and nitrite consistencies throughout location with subtle changes between other nutrients, which in turn do not necessarily convey the presence of an algal bloom. Media reports of HABs such as advisories were used as methods to further analyze the lake's compositional content and ecological effect.

Poster - morning
Environmental, Ecological & Marine Sciences
59. The Fit, the Stressed, and the Ugly; Exploring Relationships Among Body Condition, Corticosterone Hormone, and Sexual Ornamentation in a Songbird
By: Rindy Anderson, Morgan Slevin, Asiah Noel, Ana Estrella, and Lourdes Sprinckmoller
Faculty Mentor(s): Rindy Anderson and Morgan Slevin
Presenters**: Lourdes Sprinckmoller**, Asiah Noel, and Ana Estrella

Our study explores relationships among stress, health, and sexual ornaments (bill color, song) in a wild songbird, the Northern Cardinal. When a bird experiences a stressor, the "fight or flight" hormonal response is evoked. This response includes elevated glucocorticoid hormones that evoke behavioral and physiological changes. In this study, we aim to quantify concentrations of the hormone corticosterone (CORT), which is involved in the avian stress response, and analyze its connections with body condition and sexual ornamentation. We will use 160 plasma samples collected at two-time points from wild Cardinals to quantify how each bird elevated CORT in response to capture. We will then relate measures of the CORT response to measures of body condition, the health of the gut microbiome, redness of the bill, and qualities of a song for each bird. Data collection and analysis are in progress, and results are expected within the next two months.

Poster - afternoon

Health & Medical Sciences

60. Response of Gut Microbiomes of Mice to Microcystin in the Presence of Sulforaphane and Varying Fat Diet

By: Mahi Barot, Latanya Hall, Jean Bontemps, Krista McCoy, and Nwadiuto Esiobu

Faculty Mentor(s): Nwadiuto Esiobu and Krista McCoy

Presenters**: Mahi Barot** and Latanya Hall

According to recent developments in microbiology research, gut microbiota is implicated in the overall wellbeing, immunology, and brain function of humans. Microcystin, a cyanobacterial toxic pollutant, changes gut microbiomes rapidly and increases bacteria that mediate inflammation in the mouse model of nonalcoholic fatty liver disease. Sulforaphane, a chemical produced by broccoli and other cruciferous vegetables, helps mitigate the negative effects of several pollutants. We hypothesize that microcystin induces gut dysbiosis which is exacerbated by a high-fat diet, and that administration of sulforaphane restores gut homeostasis. Fecal samples of high/low fat diet mice were analyzed using metagenomics and standard microbiological culture techniques before exposure to 150 mg/Kg microcystin to determine the influence of microcystin on gut community structure changes with diet and nutritive supplement sulforaphane. Our research provides potential probiotics and better understanding of the physiological process which could be used in therapies against algal toxins and poor diet.

Poster - morning

Health & Medical Sciences

61. Daily Accommodations for People Living with Posterior Cortical Atrophy Disease

By: Camila Marques Cuoco and Krystal D. Mize

Faculty Mentor(s): Krystal D. Mize and David F. Bjorklund

Presenters**: Camila Marques Cuoco**

People living with neurocognitive degenerative diseases such as posterior cortical atrophy (PCA) encounter unique challenges in their daily life and often struggle to find accommodations that support their needs. The purpose of this project is to interview those living with PCA to better understand what type of accommodations are needed for a good quality of life. The patients revealed that because little is known about their condition, they are often given resources that are not helpful such as memory or blindness accommodations. In this project, we address the unique challenges facing patients with PCA such as mobilization difficulty, reading and writing difficulties, visual-spatial deficits, as well as other independent living and home safety concerns. Ultimately this project aims to

create a guide of accommodations for patients, loved ones, and healthcare providers as a means of enhancing the experience of those living with the PCA.

Poster - afternoon
Basic Sciences
62. Mineralization and Mechanics of Shark Cartilage
By: Dawn Raja Somu, Malena Fuentes and Vivian Merk
Faculty Mentor(s): Vivian Merk
Presenters**: Malena Fuentes**

Shark cartilage is a complex multi-scale material containing collagen fibers, sulfated sugars, and inorganic minerals. Previous research on shark mineralized vertebral cartilage has shown that the mineral content and arrangement vary among species. We hypothesize that the variation in mineral content and arrangement have mechanical consequences for the spring function and dynamic mechanics of the vertebral column during swimming. Mineralized blocks or radiating lamellae alternate with unmineralized regions in a species-specific pattern, which raises the question as to how inorganic and organic constituents interact. Our experimental approach explores the relationship between nanomechanical performance, structure, and chemical composition of the complex mineralized tissues. Vertebral mineralization patterns and mechanical properties were studied using atomic force microscopy (AFM), allowing us to quantify local biomechanical characteristics, Raman spectroscopy to detect compositional changes in the mineral content, and scanning electron microscopy (SEM) to identify the differences between surface textures of the shark cartilage.

Poster - morning
Basic Sciences
63. Let's Get Moving: A study of Toughness and Stiffness of the Shortfin Mako, Isurus Oxyrinchus Vertebrae
By: Maria Uribe Mejia, Delaney Frazier, and Marianne E. Porter
Faculty Mentor(s): Marianne Porter
Presenters**: Maria Uribe Mejia**

The cartilaginous vertebral columns in elasmobranchs experience compression and tension during swimming. Previous studies tested three ontogenetic groups, and they found that the young of the year group outperformed the other ontogenic groups in stiffness and strength, specifically in the posterior region. They hypothesized that the posterior region needed to be stiffer and stronger to support the forces required for fast swimming. We tested three regions of Isurus oxyrinchus, shortfin

mako, (anterior, middle, and posterior) for toughness and stiffness using relevant biological strain rates of 0.1%, 1.0%, and 10%. We hypothesized there would be a variation in toughness and stiffness between regions due to higher mineral content, which correlates with high tail beat frequency, leading to faster swimming.

Poster - afternoon
Behavioral, Educational & Social Sciences
64. Predicting Rekindling and Rebounding Desire After Romantic Relationship Breakup
By: Emily Weser, Morgan Cope, and Michael Maniaci
Faculty Mentor(s): Michael Maniaci and Morgan Cope
Presenters**: Emily Weser**

In the process of breaking up with a romantic relationship partner, some people may react in different ways as a form of relationship dissolution. Some may rebound, seeking a new partner right after the previous breakup. Others may desire getting back together with their previous partner, otherwise known as rekindling. Based on previous research, I hypothesize that those who experience a high volume of attachment anxiety will express desire to rebound towards a new partner. This is because attachment anxiety is associated with emotional distress and poor self-views, which leads the individual in an attempt to find a new relationship quickly. We examined a self-report and found that individuals who express an anxious attachment style, have the desire to rekindle their past romantic relationship alongside the desire to rebound to a new partner. This suggests those high in anxiety, feel the need to secure a partner to avoid being alone.

Poster - morning
Behavioral, Educational & Social Sciences
65. Attachment Style and Post-Dissolution Behavior.
By: Taniya Davis, Morgan Cope, and Michael Maniaci
Faculty Mentor(s): Michael Maniaci and Morgan Cope
Presenters**: Taniya Davis**

People have different strategies for getting over a romantic relationship breakup. These coping styles may be associated with the attachment style of individuals. I examined how reports of anxious and avoidant attachment correlated with post-dissolution strategies people may use to deal with negative emotions surrounding relationship loss including post-breakup immersion, rekindling, and expansion. I hypothesized that highly anxious attached individuals would predict more rekindling desire, while low anxious and avoidant attachment will predict more immersion and expansion behavior. No effects

were predicted for individuals with avoidant attachment. Results demonstrate that anxious attachment was positively correlated in immersion, expansion, and rekindling behaviors. Avoidantly attached individuals were also found to positively correlate with rekindling behavior. Implications of these findings indicate that anxious attachment was associated with all post-dissolution strategies which imply the desire of recovery of the self-concept post-breakup. Also, avoidantly attached individuals displayed more rekindling behavior which was unexpected.

Poster - afternoon
Environmental, Ecological & Marine Sciences
66. Analysis of FAU Ecological Preserve Canopy Coverage: Testing Field Measurement Methodologies
By: Alyssa Jiggetts, Anna Jarvis, Elise Siegel and Dianne Owen
Faculty Mentor(s): Dianne Owen
Presenters**: Alyssa Jiggetts**, Anna Jarvis, and Elise Siegel

Quantifying canopy cover allows for better support in their conservation efforts and is imperative in monitoring ecosystems. The current techniques used to record canopy coverage provide inconsistent percentages, yet, there is a lack of research and consensus on what method or methods seem to be most consistent and accurate. The techniques studied were the GRS densitometer, a laser, the spherical densitometer, and two mobile softwares, Gap Light Analysis Mobile App (GLAMA) and Canopeo. They were tested against each other while performing canopy collection at about 100 specific points in the FAU preserve, to compare the results and consistency between these current methodologies with a sufficient amount of data. The results yielded a variation in accuracy between the methods. GRS densitometer, spherical densitometer, and GLAMA provided more accurate and precise results, whereas the laser and Canopeo had more biases and larger variances in results in comparison to the former three.

Poster - morning
Environmental, Ecological & Marine Sciences
67. Surveying Antibiotic Resistance of Gram-Negative Bacteria Isolated from Wild-Caught and Rehabilitated Green Sea Turtles (Chelonia mydas) and Loggerhead Sea Turtles (Caretta caretta) of Florida
By: Isabella Donadio Pizzolato, Selah Brammer, and Sarah Milton
Faculty Mentor(s): Sarah Milton
Presenters**: Isabella Donadio Pizzolato** and Selah Brammer

Given the number of anthropogenic threats facing marine turtle species, management of wild turtles in rehabilitation facilities is a prominent issue. Studying antibiotic-resistant bacteria profiles found in marine turtles around Florida will aid in understanding the types of pollutants facing marine turtles and ensure rehabilitation facilities do not contribute to antibiotic resistance by treating turtles with antibiotics they are increasingly resistant to. Furthermore, proliferation of pathogenic antibiotic-resistant bacteria could cause an increased spread of untreatable diseases in wild turtles. Preliminary studies analyzing antibiotic resistance in marine turtles have been conducted in other regions, such as the Mediterranean, and with Loggerhead Sea Turtles (Caretta caretta), but have not yet been conducted with Green Sea Turtles (Chelonia mydas) or around Florida. This project intends to survey marine turtles around Florida to examine the antibiotic resistance profile in gut microbiome and identify trends between overall turtle health and the presence of antibiotic-resistant bacteria.

Poster - afternoon
Health & Medical Sciences
68. Evaluation of Sulforaphane as a Potential Prebiotic for Gut Microbes Exposed to Endocrine Disrupting Chemicals
By: Jean Bontemps, Bodhi Stone, Krista McCoy, and Nwadiuto Esiobu
Faculty Mentor(s): Nwadiuto Esiobu
Presenters**: Jean Bontemps**

Endocrine Disrupting Chemicals (EDC) such as plastics and some pesticides increase the risk of a wide range of developmental anomalies and diseases. There is some evidence that sulforaphane, a sulfur-rich compound found in many cruciferous vegetables, can mitigate the damage from EDC but the mechanisms are very poorly defined. This research hypothesizes that sulforaphane acts as an effective prebiotic, supporting the growth of key gut microbiomes involved in antioxidation signaling and or degradation of the toxins. Fecal samples from mice exposed to Vincolzilin (EDC) and other toxins alone; +SFN and control were analyzed using SFN-enrichment media (1.25 mh/L) and control BHI agar to determine influence of sulforaphane on recovery of gut microbiome abundance, richness, and diversity. Plate-wash PCR and BLAST protocols will be used to identify specific microbiomes stimulated by SFN which could serve as probionts in potential therapies for diseases from these ubiquitous pollutants.

Poster - morning
Health & Medical Sciences
69. Cell Starvation Caused by Amyloid Peptides (Aβ1-40 and Aβ1-42)
By: Rudolf Hall, Giselle Shim, Ibrahim Shokry, and Rui Tao
Faculty Mentor(s): Rui Tao
Presenters**: Rudolf Hall**

Individuals with Alzheimer's disease (AD) have unintentional body weight loss. In this study we propose to test the hypothesis that β-amyloid (Aβ) peptides cause a reduction in nutrient uptake into cells, resulting in cell starvation. Human immortal A172 astrocytes were used to test the hypothesis. Cells were maintained at 37°C in a humidified atmosphere of 5% CO_2, fed twice a week. After reaching about 80% confluency, cells were harvested and seeded on 96-, 48-, or 24-well plates. In this study, Aβ1-40 and Aβ1-42 at concentration of 1-50μM was examined in comparison with glucose deprivation. We tested whether the effect of Aβ was similar to the cell starvation. Compared to control, Aβ treatment caused a reduction in glucose and pyruvate into cells. The reduction was statistically significant. In summary, Aβ aggregation on cells likely causes cell starvation, which is likely the molecular mechanisms underlying for weight loss in AD patients.

Poster - afternoon
Basic Sciences
70. Evaluation of Bio-inoculants for Crop Resilience
By: Ojdre Sutherland, Karim Dawkins, and Nwadiuto Esiobu
Faculty Mentor(s): Nwadiuto Esiobu
Presenters**: Ojdre Sutherland**

Florida's Citrus production has dropped significantly from 77.4 million tons to 6.9 million tons in 2019 because of an uncontrolled bacterial disease which forced growers to other crops such as bamboo and blueberries. Microbial amendments are known to improve plant yield and resilience to disease. We hypothesize that excessive use of agrochemicals deplete the plant rhizosphere of beneficial microbes, and that the use of appropriate inoculants will enhance resistance and yield. This report is a proof of concept to test the effects of bacteria and mycorrhiza fungi on citrus - Valencia spp, and three other herb/vegetable crops of importance in Florida. Seed germination rate, plant biomass yield and the infection rate of the Liberibacter asiaticus (measured by qPCR) will be measured over time in the presence and absence of the bio-inoculants.

Poster - morning
Basic Sciences
71. An Ultrastructural Analysis of the Relationship between Synapses and Mitochondria Across Neuron Types in C. elegans
By: Maria Gabriela Restifo, Reggie Joseph, Carlos Oliva, Kerdes Joseph, Danielle Riboul, Ken Nguyen, David Hall, and Gregory T. Macleod
Faculty Mentor(s): Gregory Macleod
Presenters**: Maria Restifo**

The brain consumes 20% of the body's energy, most of which is used at synapses. Mitochondria provide approximately most of the brain's energy, and because of this role, it is probable that synapses need mitochondria close by. My goal is to test whether mitochondria are randomly distributed with respect to synapses by analyzing their degree of co-localization in 15 neurons, using EM data from hermaphroditic Caenorhabditis Elegans nematode. The synapse-mitochondrial relationship can be tested by calculating the average difference in distance and volume between these subcellular components. Another objective is to determine whether there are co-localization differences based on the function of the neuron or its neurotransmitter type or according to whether the synaptic compartment is pre or postsynaptic. This analysis aims to better understand neuronal energy dynamics and any essential requirements of synaptic transmission through uncovering hitherto uncovered relationships between synapses and mitochondria.

Poster - afternoon
Behavioral, Educational & Social Sciences
72. Physiological Measures of Discrete Emotions Using the IAPS
By: Samuel Parker, Terrence Barnhardt, and David Bickham
Faculty Mentor(s): Terrence Barnhardt
Presenters**: Samuel Parker**

This study expands on previous work examining the discrete emotions sadness, fear, disgust, anger, contentment, awe, amusement, and excitement elicited by the International Affective Picture System (IAPS). Participants were exposed to four triplets of three pictures for each of the discrete emotion categories in a counterbalanced design. Participant ratings of valence and arousal were collected. Electrodermal activity and EKG were also used to measure physiological signs of stress. We predicted greater signs of sympathetic nervous system activity for negative versus positive emotions. We also predicted that emotions precipitating motor action should elicit a greater electrodermal response. This work serves as a manipulation check for the IAPS, helps further categorization of the IAPS, and explores the physiological correlates of discrete emotions.

Poster - morning
Behavioral, Educational & Social Sciences
73. Teacher Candidate Perceptions and Understanding of the Impact of Bullying and their Role in Bullying Prevention for Students with Disabilities
By: Daniely Da Silva
Faculty Mentor(s): Lisa Finnegan
Presenters**: Daniely Da Silva**

Although bullying statistics indicate a decline, the long and short-term impacts of bullying are detrimental to both the perpetrator and the victims of bullying. Consequently, bullying remains a concern to the school district, administrators, students, and parents, especially considering the noticeable shift in significant online bullying via social media platforms. This study aims to provide insight into the teacher-candidates understanding of bullying and their role in its prevention. There is a presumption that teacher candidates understand they have to play a role in bullying prevention, however, they may lack the knowledge of how to stop and prevent bullying from occurring.

Poster - afternoon
Environmental, Ecological & Marine Sciences
74. Turning Maneuvering of Volitional Swimming Leopard Sharks
By: Lenia Jordan, Cassandra Ruddy, Andrew Nosal, and Marianne Porter
Faculty Mentor(s): Marianne Porter
Presenters**: Lenia Jordan**

In previous studies, shark maneuvering has been observed in constrained tanks to encourage tight abrupt turns, or when turns are elicited by a sensory stimulus. In leopard sharks (Triakis semifasciata), the whole body morphology were significant variables impacting turning. In this study, we quantified turning maneuvers and body shape in shoaling leopard sharks. We hypothesized that leopard sharks with longer and slimmer body shapes would have tighter turns than sharks with stocky bodies. Videos were obtained using aerial drones from the nearshore environments in La Jolla, CA, an area known to have a high abundance of leopard sharks. We used Logger Pro 3.16 software to motion track individuals using five points along the body midline. We quantified turns using the bending coefficient, which looks at the distance from the shark head to the tail. Understanding maneuvering kinematics is useful for understanding animal interactions such as foraging and mating.

Poster - morning
Behavioral, Educational & Social Sciences
75. Improve Your Commute (IYC)
By: John L. Renne, Louis A. Merlin, Katherine Freeman, Serena Hoermann, Paula Lopez, Alexandru Pasarariu, Chase Lewis, Taje Butler, Meenal Rathod, Trystine Fellman, and Michaella Louis
Faculty Mentor(s): John Renne and Serena Hoermann
Presenters**: Meenal Rathod**, Trystine Fellmann, Michaella Louis, and Chase Lewis

The IYC study aims to optimize the urban and environmental aspects of commuting to improve the academic success of students.The focus of our abstract is the process of using student ambassadors for generating research interest and participation, as opposed to conventional methods of garnering research. Method-wise, the student ambassadors will be using a multi-channel approach that includes social media content, flyers, events, games, and merchandise to generate more interest and participation from local college students. Student ambassadors will gather data on student transportation and commuting habits to optimize the urban and environmental aspects of commuting for students to improve their academic success. It will also focus on the process of using student ambassadors as opposed to conventional methods of gaining research participation, to raise awareness, interest, and participation for the IYC study.

Poster - afternoon
Health & Medical Sciences
76. Spouses of Veterans with PTSD Symptoms and their Service Dogs: Exploring the Human-Animal Bond
By: Natalie Korpinen and Beth Pratt
Faculty Mentor(s): Beth Pratt
Presenters**: Natalie Korpinen**

While service dogs are trained to perform tasks for their owners, they may also have beneficial effects on the health and wellness of their owners' spouses. The purpose of this study was to uncover the experience of spouses living with veterans who struggle from symptoms of PTSD and have a service dog. This study incorporated a qualitative exploratory design. Six participants completed demographic questionnaires and one-on-one interviews. Descriptive statistics were used to examine demographic data, and interpretive phenomenological analysis was used to examine qualitative data. Results revealed three main themes and seven sub-themes: 1. Caregiving teammate (a) collaborator (b) respecting service dog boundaries; 2. Improved health and wellbeing (a) presence (b) hopefulness (c) functional living; and 3. Unbounded relationship (a) responsibility (b) interconnection. This study

suggests that nurses who work with this population need education regarding service dogs' roles and effects on their owners and immediate family members.

Poster - afternoon
Engineering
77. The Use of Machine Learning Algorithms to Contribute in Social Good
By: Danny Alice
Faculty Mentor(s): Dimitris Pados
Presenters**: Danny Alice**

Artificial intelligence is the future. Advances in machine learning (ML) and artificial intelligence (AI) can change the way how we solve problems where there is a positive turn around not only in our communities, but around the world as well. This insight can assist with problems outlined by the United Nations sustainable 17 developmental goals such as no poverty, fighting for climate action, quality education, good health and well-being and much more. Scientists and researchers have been using artificial intelligence (AI) and machine learning (ML) in the past few years due to the need of machinery to find the solutions to their problems. The call for AI and ML to take part in these challenges has risen and continues to be as time moves forward and issues in our society appears.

Poster - afternoon
Basic Sciences
78. Creation of a Microbial Resource Collection for the Formulation of Soil Amendment Products
By: McKhaila McKenzie, Shyan Braswell, Ojdre Sutherland, Karim Dawkins, and Nwadiuto Esiobu
Faculty Mentor(s): Nwadiuto Esiobu
Presenters**: McKhaila McKenzie** and Shyan Braswell

The increasing number of crops being infected by emerging pathogens across the globe underscores the need for more plant "vaccines" using microbe libraries. Florida citrus yield, for example, has sharply declined in recent years because of a new plant disease. In this study, the rhizosphere and roots of various plant species will be mined for an assortment of plant growth-promoting microbes. Using differential selective media and 16S/18S rRNA protocols, the microbes will be isolated, identified, and characterized into four categories: hormone-producing, nitrogen-fixing, phosphate solubilizing, and biocontrol agents. A searchable database will be created. We hypothesize that plant type (root biomass, growth rate, etc.), nutrient requirement, and location will correlate with the prevalence of specific types of PGPM in their rhizospheres. The microbes will be stored in a low-temperature bead storage

system. Microbe libraries are invaluable first steps towards formulating new consortia of organisms for plant resilience.

Poster - morning
Basic Sciences
79. Discrete Neural Circuits Drive ADHD like Phenotypes in the Drosophila Melanogaster Model of NF1
By: Genesis Omana Suarez, Connor N. Broyles, and Seth M. Tomchik
Faculty Mentor(s): Catherine Trivigno and Seth Tomchik
Presenters**: Genesis Omana Suarez**

Neurofibromatosis type 1 (NF1) is a genetic disorder that predisposes individuals to develop a range of symptoms, including tumor formation and cognitive deficits. Because the neurofibromin protein in Drosophila melanogaster shares high homology to humans, the fruit fly makes a suitable model to perform genetic screens to elucidate genotype-phenotype relationships of NF1. Increased grooming behavior has been previously reported following NF1 knockdown in large neuronal clusters; however, this phenotype does not replicate in microcircuits. Thus, the requirement of Nf1 could be additive across circuits. Moreover, the ability of the fruit fly's disease model to adapt to a novel environment is yet to be established. Finally, to assess habituation in the NF1 knockdown model and a matched control clone, we quantified grooming followed by an environment modification stimulus. These results, together with other ongoing experiments, contribute to our understanding of how neural circuit dysfunction impacts motor behavior and environmental adaptation.

Poster - afternoon
Behavioral, Educational & Social Sciences
80. Action Identification and Relationship Satisfaction
By: Danny Zweben, Morgan Cope, and Michael Maniaci
Faculty Mentor(s): Michael Maniaci and Morgan Cope
Presenters**: Danny Zweben**

Actions can be defined in either lower (detailed) or higher-level (abstract) terms. Some people tend to rate actions as higher level than others across many domains, allowing them to interpret meaning from small details. In romantic relationships, this allows higher-level individuals to interpret incoming information into their existing relationship identity. Individuals who tend to think in lower-level terms may be prone to questioning the relationship based on incoming information. We hypothesized that higher-level individuals would rate their relationships as more satisfying overall, while lower-level

individuals would be more likely to report feeling unsatisfied as they may become overwhelmed or inaccurate when interpreting relationship details. We collected measures of trait action identification and relationship satisfaction from 308 participants. Results supported the hypothesis, such that individuals who think in higher-level abstract terms reported feeling more satisfied with their romantic partner.

Poster - morning
Engineering
81. Micro-Hydroelectric Kinetic Powered Desalinator
By: Jared McFadden, Tyler Gilley, Tyler Smith, Robert Pugh, Alejandro Alvaro, Carlos Garriga-Dominguez, and Pierre-Philippe Beaujean
Faculty Mentor(s): Pierre-Philippe Beaujean
Presenters**: Jared McFadden**, Tyler Gilley, Robert Pugh, Tyler Smith, Carlos Garriga Dominguez, and Alejandro Alvaro

Naturally occurring, potable water is a rapidly declining resource on Earth. The process of desalination, removing the salt from saltwater to create freshwater, is used to combat this issue. This system utilizes a power harnessing method in conjunction with a desalination method. The power harnessing method is a 9-blade water wheel capturing tidal energy and is connected to a generator by a step-down gearing system, which converts the mechanical energy to electrical energy. This electrical energy powers the chosen desalination method; Humidification-Dehumidification Desalination (HDH). The HDH process begins with an ultrasonic transducer that creates micro-cavitations in the water, producing water vapor. The water vapor is sent down a pipe cooled by the ocean current to condense the water vapor, resulting in freshwater. This desalination method was chosen because of its low power demand, minimal maintenance, and compatibility with our water wheel.

Poster - afternoon
Environmental, Ecological & Marine Sciences
82. Strategic Time and Speed Management of a 4-Seater Solar Automobile
By: Ayush Gowda, Boone Douglass, and Christian Engman
Faculty Mentor(s): Allan Phipps
Presenters**: Ayush Gowda**, Boone Douglass, and Christian Engman

This project attempts to create a model to optimize the energy consumption and production of a solar-powered vehicle by finding measurable factors that affect energy expenditure and yield. Previous research in this field has looked at solar energy production in specific locations and at energy

consumption in electric vehicles. However, almost none have attempted both. To increase the accuracy of the model, any factors that could change the car's movement or energy gathering capabilities were taken into account. Data were gathered from previous solar car testing or taken from NREL's NSRDB database using their Application Programming Interface (API), this allows for easy and timely access to their database and automating data collection for large data sets. If the model's predictions are accurate, they can be used to optimize performance for solar and electric vehicles to make them more effective.

Poster - morning
Behavioral, Educational & Social Sciences
83. "Just Teasing" or "Unjust" Insulting?
By: Jaimie Yap and Carol Mills
Faculty Mentor(s): Carol Mills
Presenters**: Jaimie Yap**

This study aims to shed light on how banter messages are received and why. Limited work has been conducted on the communicative act of banter. Various definitions for banter exist, making such incidents open to interpretation. To determine how outsiders perceive banter, about 200 adult workforce participants(ages 18-25) anonymously completed a Qualtrics survey through MTurk. Participants were randomly assigned a 20-30 second bantering scenario video to evaluate the interaction quality observed. MANCOVA, conducted on the effects assessment of interaction, measured multiple factors to determine variables affecting results. The measure of bullying experience responses compared personal accounts to banter perceptions to identify relations. Findings show participant viewpoint is influenced by the sex of the teaser and observer, nonverbal cues, and personal experience. Implications suggest our experiences shape how we later perceive those around us. These findings will help us effectively distinguish between banter and bullying by recognizing where our bias stems.

Poster - afternoon
Health & Medical Sciences
84. Exploring the Relationship Between Starvation, Amyloid-β Peptides, and Alzheimer's Disease
By: Mary Adam and Rui Tao
Faculty Mentor(s): Rui Tao
Presenters**: Mary Adam**

Inflammation of the neurons has long been observed within Alzheimer's Disease (Kinney et al., 2018), alongside an increase in Amyloid-β peptides and an overall decrease in glucose metabolism (Marcus et al., 2014). This decrease in glucose metabolism shows that neural cells are using more energy than they are intaking, starving as they are not able to get enough nutrients, also aligning with the observation that full-body weight loss is also common in AD (Gillette-Guyonnet, 2000). The objective of current research is to measure cells' output of adenosine triphosphate (ATP), adenosine diphosphate (ADP), and adenosine monophosphate (AMP) in order to find the relationship between Aβ peptides and energy production of the neurons. We hypothesize that an accumulation of Aβ will cause a lower output of AMP, ADP, and ATP, causing the inflammation in AD. Knowing the specifics of Aβ peptides's role in the pathogenesis of AD could help advance AD treatment.

Poster - morning
Basic Sciences
85. Testing if Territory Size Relates to Gut Microbiome Characteristics of the Northern Cardinal (Cardinalis cardinalis) in a Semi-urbanized Area
By: Kayla Ahlness, Morgan Slevin, and Rindy Anderson
Faculty Mentor(s): Rindy Anderson
Presenters**: Kayla Ahlness**

Territoriality of the Northern cardinal is well researched, although little is known regarding if health influences territory size. Maintaining a large territory increases fitness by providing adequate breeding resources, but larger territories require heightened competitive ability and energy expenditure to defend. Recent findings indicate the gut microbiome can predict health in cardinals. This research tests the correlation between territory size and gut microbiome diversity (cloacal samples already collected) in Northern cardinal males. The study is being conducted at Tree Tops Park, targeting color-banded males. GPS points are marked where a male displays territorial defense (i.e. song), either unprompted or in response to audio playback. Territory size is being estimated via ArcGIS to create a comprehensive territory map. the gut microbiome. Data collection is ongoing, and results will be determined by Spearman correlation tests comparing territory size (hectares) and alpha diversity (Shannon index and number of Absolute Sequence Variants observed).

Poster - afternoon
Behavioral, Educational & Social Sciences
86. The Impact of the COVID-19 Pandemic on the Mental Health, Physical Health, and Media Use of College Students with ADHD
By: Ali Idriss, Lisa Finnegan, Michael Tollefsrud, Tomer Zilbershtein, Kshitij Chaube, Paritosh Jadhao, Shannon O'Hara Wiora, Joel Brandwein, and Jonathan Spaan
Faculty Mentor(s): Lisa Finnegan
Presenters**: Ali Idriss**

The COVID-19 pandemic has had major implications on the health and well-being of people all around the world. More specifically, college students with ADHD in the US have faced social isolation and major changes to their learning environments in the Spring semester of 2020 due to COVID-19 restrictions. Our goal is to examine various life changes of college students with ADHD due to COVID-19 restrictions and differences in their physical health, mental health, and media use before and during the pandemic. We also intend to examine the association between COVID-19 worries and COVID-19 stress and changes in physical health, mental health, and media use before and during the pandemic. Ninety-one subjects have participated in a modified self-report assessing various aspects of the social, emotional, and physical impacts of the pandemic on each subject. Currently, we are using pair sample t-tests, and regression to conduct the analyses.

Poster - morning
Basic Sciences
87. Ecdysone Recovery of MSR Deficient Drosophila
By: Brenna White, Itzel Cabrera, and Alexandra Brown
Faculty Mentor(s): David Binninger
Presenters**: Brenna White**, Itzel Cabrera, and Alexandra Brown

Methionine sulfoxide reductase (MSR) functions to restore oxidized methionine to functional methionine. MSR is a ubiquitous enzyme found in nearly all organisms from bacteria to humans. Our lab has created genetic mutants of Drosophila (fruit fly) that lack MSR activity. These mutants have a prolonged third larval instar and the adult flies have a dramatically reduced lifespan. Serotonin is a neurotransmitter that affects behavior and has recently been discovered to regulate ecdysone, a hormone required for larval development. Since ecdysone functions downstream of serotonin, we are testing the hypothesis that supplementing the culture medium with ecdysone can rescue the prolonged larval third instar development and possibly extend the lifespan in flies lacking MSR activity. If the hypothesis is correct, it suggests that the absence of MSR affects the level of serotonin or possibly interferes with the function of one or more of the five serotonin receptors.

Poster - afternoon
Health & Medical Sciences
88. Using qPCR to Determine Total Bacteria and Potential Biomarkers of Non-balding and Balding Hair in Humans
By: Deena Davis, Aziza Abdelaziz, Katrina Dobinda, and Nwadiuto Esiobu
Faculty Mentor(s): Nwadiuto Esiobu
Presenters**: Deena Davis**

About 80% of adult men over the age of 50 are affected by hair loss, with very limited and affordable solutions and therapy. There is growing evidence that scalp and follicular dysbiosis could contribute to hair thinning and loss. In this study, metagenomics extracted from the hair follicles and scalp swabs of actively balding and non-balding subjects were analyzed using SYBR Green Quantitative Real-Time PCR to determine the correlation between total bacteria and prevalence of specific bacteria biomarkers and hair loss. For total bacteria, primers flanking the V3-V4 hypervariable regions of the 16S rRNA gene was used, while primers targeting Cutibacterium acnes and Stenotrophomonas geniculata, as well as Staphylococcus epidermidis will be evaluated for key biomarkers. This report describes how changes in bacteria communities are related to balding and underscores the need for including microbiome considerations in hair therapy.

Poster - morning
Basic Sciences
89. Is the Vocal Performance of the Northern Cardinal (Cardinalis cardinalis) Related to its Microbiome Diversity?
By: Kayla Ahlness, Don Cadet, Rebeca Castro, Ryan Gomes, Morgan Slevin, and Rindy Anderson
Faculty Mentor(s): Rindy Anderson
Presenters**: Ryan Gomes**, Rebeca Castro, and Kayla Ahlness

The vocal repertoire for the Northern cardinal (Cardinalis cardinalis) encompasses multi-syllable songs and has been heavily researched. Males (and females) will sing to display territory defense and engage in courtship, often singing for ≥10 mins straight. Based on emerging microbiota-gut-brain relationships, males with greater vocal performance (i.e. "better" singers) are predicted to have more diverse gut microbiomes. We aim to test for correlation between the vocal performance and gut microbiome diversity in male Northern cardinals. We have recorded a sample of previously color-banded males at Tree Tops Park and are currently scoring each recording for vocal performance through RavenPro Bioacoustic Analysis software. Spearman correlation tests will compare vocal performance for each male against microbiome alpha diversity from previously collected cloacal samples. By studying singing

behavior and comparing vocal complexity to microbiome samples, we can evaluate potential effects gut health may have on brain function and test for microbiota-gut-brain relationships.

Poster - afternoon
Behavioral, Educational & Social Sciences
90. Verbal Learning Task Intrusion Differences Across Hispanic Cognitive Diagnostic Groups: A Longitudinal Analysis
By: Leticia Prado, Layaly Shihadeh, Merike Lang, Alicia Goyizolo, and Monica Rosselli, and 1Florida Alzheimer's Disease Research Investigators
Faculty Mentor(s): Monica Rosselli
Presenters**: Alicia Goytizolo**

This study aimed to compare Hispanics with normal cognition and mild cognitive impairment (MCI) in their intrusion percentage scores on the Hopkins Verbal Learning Test (HVLT). We hypothesized that Hispanics with MCI would display a higher percentage of intrusions on HVLT immediate and delayed recall trials across two years. A within-subjects effects test in the immediate recall trials showed significant interaction between bilingualism and the percentage of immediate intrusions. For between-subjects effects, bilingual status and diagnosis were significant. The within-subjects effects for delay recall trials showed no significant interaction between the percentage of delayed intrusions and any variables in the model. For between-subjects effects, males and monolinguals demonstrated significantly higher percentages of intrusions over total words recalled in delayed trials. These results demonstrate that for Hispanics, HVLT intrusions may help determine cognitive decline from MCI, and this relationship may depend on factors such as demographics and bilingualism.

Poster - morning
Basic Sciences
91. Eliminating Breast Cancer Cells by Blocking the Immune Evasion "Don't Eat Me" Signal
By: David Harbaugh, Marissa Shank, and Jordan Merritt
Faculty Mentor(s): Jordan Merritt
Presenters**: David Harbaugh** and Marissa Shank

Cancer is a disease that features dysregulated cellular proliferation associated with the evasion of immune response mechanisms. The human breast cancer cell line MCF-7 upregulates CD47 on its cell surface to interact with signal-regulatory protein alpha (SIRPα) on THP-1 macrophages to evade phagocytosis, enabling cell survival and proliferation. Prior research demonstrates that targeting CD47 with anti-human CD47 antibodies is an effective strategy to block the CD47-SIRPα interaction.

Similarly, we expect to inhibit the CD47-SIRPα interaction by outcompeting SIRPα with known ligand thrombospondin-1 for CD47. This interaction will elicit an immune response from THP-1 macrophage resulting in the phagocytosis of the MCF-7 cells and production of pro-inflammatory cytokine IL-1α. Further understanding of ways to manipulate the CD47-SIRPα interaction between cancer cells and immune cells could lead to combinational therapies that are more effective than the individual therapies administered separately.

Poster - afternoon
Health & Medical Sciences
92. Culture Conditions for the Recall of Preexisting Memory B and T Cells to Childhood Vaccine Antigens within Peripheral Blood
By: Sara Thomas, Imtisal Imran, Czdari Lee, and Mahyar Nouri-Shirazi
Faculty Mentor(s): Mahyar Nouri-Shirazi
Presenters**: Imtisal Imran** and Sara Thomas

Studies indicate that smokers have impaired immune responses to natural infections and booster vaccines, which could adversely influence herd immunity during pandemics and epidemics. Using an animal model, we reported that nicotine compromises the immune response to prophylactic and therapeutic vaccines by negatively affecting dendritic cell (DC) activity and ensuing DC-natural killer cross-talk. These studies suggest that smoking may attenuate preexisting memory cells specific to childhood and booster vaccines. To test this hypothesis, we first evaluated culture conditions to detect preexisting memory cells specific to vaccine antigens in nonsmoker blood samples. For humoral immunity, R848/IL-2 was optimal for the differentiation of memory B cells into IgG-secreting plasma cells. For cellular immunity, GM-CSF most effectively supported the differentiation of memory T cells into IFN-g-producing effector cells. These select conditions can be utilized to assess the impact of external factors like smoking on the development and longevity of immune memory to vaccines.

Poster - morning
Environmental, Ecological & Marine Sciences
93. Utilizing Newly Developed Solvents and the Waste Heat Produced to Regenerate the Solvent that Reduces and Filters Carbon Emissions from Power Plants
By: Vinu Suthakaran
Faculty Mentor(s): Masoud Jahandar Lashaki
Presenters**: Vinu Suthakaran**

Produced CO2 emissions generated through power plants has long been detrimental to the environment. A newly developed solvent known as EEMPA offers a new solution as a water-lean solvent that is more cost effective than other water lean solvents. When utilizing solvents previously to capture these CO2 emissions, regeneration was a costly process due to the aqueous amines being water-rich leading them to need to be boiled at high temperatures for reuse. Rather than focusing on regenerating the solvent through cost, the method utilized in this project is the use of waste heat produced from the process as it usually is distributed in polluting ways that can lead to separate issues such as coral bleaching if not carefully disposed of. This project looks towards utilizing industrial ecology as a means of developing a solution to the problem at hand and focusing on working through power plants to reduce CO2 emissions.

Poster - afternoon
Basic Sciences
94. Influence of Melatonin Biosynthesis in Plant Stress Response
By: Aisha Mirza, Patricia Yu, Robert Van de Werken, Khaled Chehab, Nicholas Nifakos and Xing-Hai Zhang
Faculty Mentor(s): Xing-Hai Zhang
Presenters**: Aisha Mirza**, Patricia Yu, Robert Van de Werken, and Khaled Chehab

The biosynthesis pathway of melatonin involves the enzymes SNAT (serotonin N-acetyltransferase) and ASMT (acetylserotonin O-methyltransferase). It has been recently discovered that this hormone aids in regulating abiotic stress response in plants. The plant used for this project was tobacco (Nicotiana tabacum), a genetic plant model widely applicable to other plant research. Our lab has created tobacco plants where the melatonin genes SNAT and ASMT were knocked out by CRISPR technology. We analyzed the genotype of these plants by germinating the seeds in medium containing hygromycin. Seed germination and seedling growth were tested under abiotic stress conditions such as high levels of NaCl, mannitol, and sorbitol. Gene editing and gene expression of SNAT and ASMT was measured in both the control plants and the knock-out plants using qPCR. Our studies provide new insight into the involvement of melatonin in regulating abiotic stress and manipulating hormone levels to impact plant stress response.

Poster - morning
Environmental, Ecological & Marine Sciences
95. Repeatability of Aggression in Astyanax Mexicanus
By: Lina Crisostomo, Roberto Rodriguez-Morales, Erik Dubouè, and Johanna Kowalko
Faculty Mentor(s): Erik Duboué and Johanna Kowalko
Presenters**: Lina Crisostomo**

Aggression is a complex behavior conserved across the animal kingdom in vertebrates, including fish. The Astyanax mexicanus model provides multiple cavefish populations which have evolved independently. In these populations, there are differences in behaviors, like aggression. Previous findings suggest that surface fish are more aggressive than cavefish. Through this, we have identified multiple behaviors within aggression. The continuity of these behaviors is important because it can show us how aggression is developed and if there is a baseline that can be measured repeatably. To test this, we looked at the repeatability of these aggressive behaviors through the resident-intruder assay, a method to measure offensive aggression and defensive behaviors. Preliminary data suggest that surface fish showcase an increase in aggression while cavefish display constant or no aggression as trials progress. Taken together, this could lead to understanding the genetic underlings and neural circuits controlling aggression in fish.

Poster - afternoon
Health & Medical Sciences
96. Abstract of Critical Turning Point: Mother's Decision to Withdraw their Infant from Life Support
By: Veronica Laracuente and Dawn Hawthorne
Faculty Mentor(s): Dawn Hawthorne
Presenters**: Veronica Laracuente**

The death of an infant is unimaginable as most parents expect not to outlive their children. Having to make the decision to withdraw their infant from life support creates a critical turning point that causes a shift in the direction of one's life. The purpose of this study was to describe the critical turning points associated with the decision to remove their infant from life support. Story Inquiry Theory was used to guide this qualitative study. Open-ended, in-depth, semi-structured interviews were collected from mothers 13-16 months after the death of their infant. Mothers were asked to describe the events surrounding the death of the infant. The results revealed three themes: being present and building a future, being with and being heard, and finding meaning in the tragedy. The study findings can enhance nurses support to mothers who made the painful and difficult decision to withdraw their infant from life support.

Poster - morning
Environmental, Ecological & Marine Sciences
97. Galagoides of Lomami National Park in the Democratic Republic of the Congo and Tanoé-Ehy Forest in the Ivory Coast
By: Eugenia Jean
Faculty Mentor(s): Kate Detwiler and Kathryn Coates
Presenters**: Eugenia Jean**

Bioacoustics are useful for differentiating cryptic primates in remote rainforests. Galagos can be difficult to identify visually, but species-specific vocalizations can be used to recognize species. The study sites are Lomami National Park (LNP) in the Democratic Republic of the Congo and Tanoé-Ehy Forest (TEF) in the Ivory Coast. The primary goal is to review vocalization data from camera trap videos and SM4 recordings to distinguish between two closely related, nocturnal dwarf galago species (Galagoides demidoff and Galagoides thomasi). I used the acoustic programs Kaleidoscope Pro and Raven Pro to extract, cluster, and measure call parameters. I hypothesized that it is possible to confirm the presence of both species within their preferred habitats. I found evidence of G. thomasi within both sites, and G. demidoff in LNP. This study validates the implementation of passive acoustic monitoring in areas of conservation priority by improving biodiversity estimates for cryptic species.

Poster - afternoon
Cross Disciplinary Projects
98. Opinions on Emerging Transportation Technologies
By: Priyanka Perumalraja
Faculty Mentor(s): Monica Escaleras and Eric Levy
Presenters**: Priyanka Perumalraja**

The future of transportation is a continuously evolving subject with the constant development of advanced technologies. New emerging transportation technologies such as electric and self-driving vehicles, high-speed trains, and hyperloops may prove to be highly significant in the future of transportation. This study analyzes the opinions of Americans ages 18 and over on their comfortability traveling in self-driving and electric vehicles, high-speed trains, hyperloops, and space travel, and whether they think they would be more prevalent in the future. Overall, the public believes electric vehicles, high-speed trains, and space travel will be more prevalent in the future. From these results, the market for electric vehicles, high-speed trains, and space travel may expand in the future. Understanding consumers' willingness to use these technologies, and their opinions on the potential future of advanced transportation, may help to understand whether there will be a market for these technologies and how it will behave.

Poster - morning
Engineering
99. Minimizing Gas Leakage from Lab-Scale Anaerobic Digesters
By: Lusnel Ferdinand, Laura Martinez, and Daniel Meeroff
Faculty Mentor(s): Daniel Meeroff
Presenters**: Lusnel Ferdinand** and Laura Martinez

Anaerobic digestion (AD) has been regarded as a practical process for converting organic matter into biogas, which can be converted into energy using a variety of feedstocks such as municipal solid waste (MSW), thickened waste activated sludge (TWAS), food waste (FW), and livestock waste (LW). The use of AD alongside wastewater treatment plants is favored since the presence of bacteria in wastewater aids in the breakdown of organic matter from feedstocks, and since many wastewater treatment plants have the infrastructure needed to incorporate AD, the practice is feasible. To determine the best mix of feedstocks to maximize the production of methane from biogas to generate electricity, research is needed to accurately measure the volume of biogas produced using a volume displacement approach with the least amount of leakage possible. Previous measurement methods used direct mass transfer capture, but the leakage exceeded.

Visual Arts - afternoon
Music, Art, Literature, Theater, History & Philosophy
100. Hotspot
By: Gina Marie Gruss
Faculty Mentor(s): Annina Ruest
Presenters**: Gina Marie Gruss**

"Hotspot" is an interactive digital art piece that investigates the objectification of women's bodies and the "male gaze;" questions women's historical and current places in art and technology (as muses, fans, and supporters—not creators in their own right); as well as reveals the invisible damage that constant harassment and surveying does to a woman. It received an OURI grant and is being crafted with the help of Professor Annina Ruest. When interacting with "Hotspot," you first look at the mannequin regularly; investigating the clothes, body. Then, with the use of a thermal imaging camera, you see the patterns of heat and cold that light up the body—hotspots being in areas that have faced more scrutiny. In that process, you become the voyeur. It is important and timely, especially in a post-#metoo world, to challenge our conceptions and fix wrongdoings. "Hotspot" brings light to this issue—literally and metaphorically.

Poster - morning

Engineering

101. Lee County Leachate Clogging Study

By: Thu Nguyen, Laura Martinez, Maurier John-LaFon, and Daniel Meeroff

Faculty Mentor(s): Daniel Meeroff

Presenters**: Thu Nguyen**, Laura Martinez, and Maurier John-LaFon

A leachate collection system (LCS) is a system installed in a municipal solid waste landfill to collect either rainwater seeping through the waste or moisture formed from waste breakdown. However, many LCSs often encounter leachate drainage clogging. Factors that affect LCS clogging include water quality parameters such as temperature, pH, calcium, chemical oxygen demand, and total dissolved solids. Lee County is located on the South West coast of Florida, which has the rainy season from May to October. The study's objective is to analyze leachate quality from Lee County's solid waste authority to predict mineral precipitation and further prevent operational challenges that might lead to groundwater contamination. Langelier Saturation Index (LSI) and Ryznar Index (RI) will be used to calculate the calcium saturation indices before and after chemical addition interventions to control clogging. The LSI and RI values are anticipated to be different in pre-clogged pipes versus clogged pipes.

Poster - afternoon

Environmental, Ecological & Marine Sciences

102. An Analysis of the Extended Reproductive Season of Gopher Tortoises in Southeastern Florida

By: Riley Waters

Faculty Mentor(s): Jon Moore

Presenters**: Riley Waters**

Gopher tortoises are known to have a breeding season that takes place throughout spring and early summer. However, recent research has documented that the gopher tortoises of southeastern Florida have been found to mate throughout the fall and winter months as well, suggesting an extended, and possibly year-round, reproductive season for these gopher tortoises. This may be due to the extreme climate conditions of south Florida. This project will be an analysis of the fecundity of female gopher tortoises at one location in Jupiter, FL to assess the possibility of an extended reproductive season. Field ultrasound equipment will be used to find gravid females, along with nest surveys conducted to find nests in the fall and winter months. This research will determine whether reproduction in the fall and winter is a significant survival strategy for gopher tortoises of southeastern Florida.

Undergraduate Research Symposium | 2022