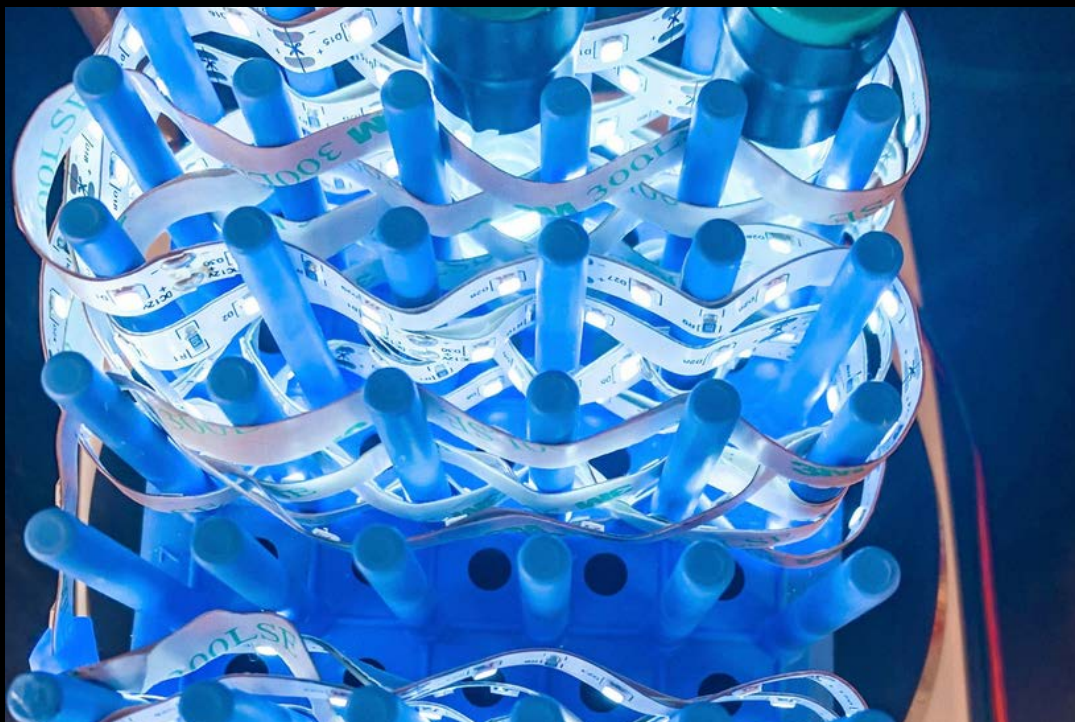
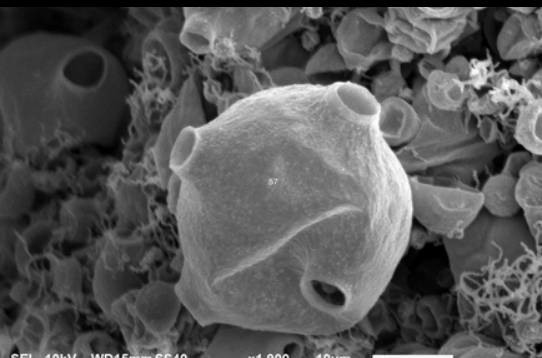


CNHS UNDERGRADUATE research SYMPOSIUM



FRIDAY, APRIL 28TH FROM 2-5 P.M. VAUGHN 9TH FLOOR

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Schedule

2:00 - 3:00 p.m.

Keynote Speaker

3:00 - 5:00 p.m.

Poster Session

Awards for best poster presentations will be announced immediately following the poster sessions.

The CNHS Undergraduate Research Symposium provides an opportunity for students within the College of Natural and Health Sciences to present their current or recently completed research projects in a poster format. The research may have been performed as part of a course (indicated with an asterisk), an Honors Research Fellowship, or an independent project conducted with a faculty mentor. Abstracts for all poster presentations are included in this program and are listed according to poster number.

The Symposium was initiated in 2013 through a generous grant from the UT Board of Fellows. Further financial support from the Office of the Dean of CNHS, the Department of Biology and Department of Chemistry, Biochemistry and Physics, and the Office of Undergraduate Research and Inquiry is also acknowledged. Finally, the organizers would like to thank all presenters, faculty mentors, and faculty judges for their participation in this event.

KEYNOTE SPEAKER

2-3 P.M. TRUSTEE BOARDROOM- 9TH VC

BAYLEIGH BENNER, PH.D.

**POSTDOCTORAL FELLOW AT WOODS HOLE OCEANIC
INSTITUTION (UT ALUMNA)**

**CHARACTERIZING EARTH'S VIROME: FROM
HUMAN PATHOGENS TO THE DEEP SEA**



ABSTRACTS

1. Hydrodynamic Form and Function of Hammerhead Sharks: Ontogenetic and Ecological Considerations

Sam Johnson, Alexandra Butler, Dan Huber, Michael Slattery

The planning surfaces of aquatic organisms are crucial in navigating their habitat and in providing energy-efficient modes of locomotion. The hammerhead cephalofoil has been studied for both its sensory advantages and its possible enhancement of hydrodynamic efficiency, specifically as a lift-generating structure. This project analyzed the cephalofoils and fins (planning surfaces) of the scalloped hammerhead, great hammerhead, and bonnethead sharks to determine changes in the size and shape of these structures with respect to habitat. It was hypothesized that these structures would be smallest relative to body size in the coastal dwelling bonnethead to facilitate maneuverability and largest relative to body size in the pelagic great hammerhead to facilitate cruising. Furthermore, it was hypothesized that these structures would grow isometrically in both species given that they spend their entire lives in a single habitat type (coastal and pelagic, respectively). In contrast, it was hypothesized that the scalloped hammerhead would have structures that grow with positive allometry in association with an ontogenetic habitat shift (coastal to pelagic). Results indicate variability in size and shape of the planning surfaces, and partial support of the above hypotheses. Further analysis is forthcoming in determining specific modes of growth and shape changes over ontogeny.

2. Form and Function of Hammerhead Shark Fin Morphology: Habitat and Maturity

Alexandra Butler, Dan Huber, Sam Johnson, Michael Slattery

The planning surfaces of aquatic organisms are crucial in navigation of their habitat and in providing energy-efficient modes of locomotion. The hammerhead cephalofoil has been studied for both its sensory advantages and its possible enhancement of hydrodynamic efficiency, specifically as a lift-generating structure. This project analyzed the cephalofoils and fins (planning surfaces) of *S. lewini*, *S. mokarran*, and *S. tiburo* (the scalloped hammerhead, great hammerhead, and bonnethead sharks) using morphometric analysis to determine changes in the size and shape of these structures with respect to the habitats used by these species. It was hypothesized that these structures would be smallest relative to body size in the coastal dwelling *S. tiburo* to facilitate maneuverability and largest relative to body size in the pelagic *S. mokarran* to facilitate cruising. Furthermore, it was hypothesized that these structures would grow isometrically in both species given that they spend their entire lives in a single habitat type (coastal and pelagic, respectively). In contrast, it was hypothesized that *S. lewini* would have intermediate-sized cephalofoil and fins relative to body size and that these structures would grow with positive allometry in association with the transition from coastal habitats (juvenile stage) to pelagic habitats (adult stage).

3. PA Students' Attitudes, Knowledge, and Perceptions About Marijuana

Kathryn Lawler, Abigail Strauss, Mary Martinasek, Allison Kaczmarek

Purpose: Statewide policy changes in recreational and medical marijuana laws affecting clinical medicine prompt educational programs to ensure students with the changing landscape. This study aimed to explore current and past physician assistant students' attitudes, knowledge, and perceptions towards recreational and medical marijuana.

Methods: A cross-sectional study was conducted with Physician Assistant (PA) students and alumni (n=62) from a mid-sized university in Southeast U.S. The study consisted of an online survey of 40 questions pertaining to both medical and recreational marijuana administered through Qualtrics™. Both descriptive and analytical statistics were conducted using SPSS version 27.

Results: When asked about counseling patients on medical marijuana only 50.9% felt comfortable. However, they were less comfortable with discussing drug interactions. (32.2%). The participants felt that edibles were the safest route of administration (46.8%). The majority felt it should be incorporated into the curricula of health sciences courses (79.6%). There was a statistically significant association between their knowledge and comfort in answering questions about the efficacy ($p < 0.001$). There was a statistically significant association between knowledge and drug interactions ($p = 0.005$).

Conclusion: The results of this study are concurrent with previous research, concluding that medical marijuana education should be further incorporated into healthcare curricula.

This research is the first to assess PA student knowledge, attitudes, and perceptions surrounding medical and recreational marijuana. Future studies should include other healthcare students who may counsel and educate patients on medical and recreational marijuana in their future careers.

4. A laboratory sequence linking Organic Chemistry II and Biochemistry Laboratories

Brianna Grossman, Evan A. Ambrose, Lucas A. Repke, Christopher D. Ciesla, C. Eric Ballard, and D. Scott Witherow

Our department's curriculum includes courses in general, organic, analytical, inorganic, physical, marine, and biochemistry. Often, students take one course after another without seeing how they blend to form the bigger picture. Students frequently say they wish they realized how the courses related to each other earlier in their academic career. Our goal in this project is to design a lab project that bridges the organic chemistry and biochemistry subdisciplines. Currently, Biochemistry Laboratory consists of a 10-week long project that creates a research-like feel that students enjoy based on data from student perception surveys. In this project, we intend to enhance that experience by using student-generated compounds synthesized in Organic Chemistry II Laboratory; students will prepare analogs of L-phenylalanine in that course. Students in Biochemistry Laboratory will analyze the effectiveness of those compounds in inhibiting the enzyme calf intestinal alkaline phosphatase. Many students take these two courses in consecutive semesters, and we hope that several students will be able to synthesize a sample one semester and test it during the following semester. This

experience will provide an example to students of how chemistry projects are linked in the real world. For instance, pharmaceutical and organic chemists often work together with biochemists in designing drugs, which are then tested for the effectiveness in targeting a protein. This project may provide students with an opportunity to see connections they might not otherwise realize exist. In this poster, we will present student-generated data from pilot experiments, as well as pedagogical information. This research was supported by a University of Tampa Research Innovation and Scholarly Excellence Award/David DeLo Research Grant (CEB, DSW).

5. Transition Metal-Free 1,2-Dioxygenation of 1,3-Dienes

Sophia M. Baldassarre, Adam P. Louise, Layna L. Summer, Brett N. Hemric

This proposal seeks to utilize a novel reaction platform using TEMPO, an oxygen radical source, to initiate addition to conjugated 1,3-dienes under mild conditions, beginning with the introduction of carboxylic acids as the terminal nucleophilic trapping partner.

6. Progress Towards Lewis Base-Catalyzed Addition of Nitrogen to Alkenes

Thalia A. Garcia, Brett N. Hemric

This project reports progress on the utilization of Lewis bases as catalysts for the addition of nitrogen to alkenes. Nitrogen holds a privileged status within modern pharmaceutical development and methods to access organic molecules containing these scaffolds in highly desired. By utilizing an established class of enantioselective reactions (Lewis base catalysis) this platform can address challenges in alkene amination chemistry and expand the versatility of current Lewis base catalyst strategies.

7. Anatomy of a Substrate Scope: Synthesis of a Library of 1,3-Dienes

Adam P. Louise, Sophia M. Baldassarre, Layna L. Summer, Brett N. Hemric

One of the most important aspects of the development of publications on the discovery of new chemical reactions is the testing of the reaction on a diverse array of steric and electronic environments to determine the capabilities (scope) of the new reaction. Despite its prominence in the assembly of scientific literature, the testing of the substrate scope is often taken for granted. This work details the synthetic processes and methods required to assemble a library of 1,3-dienes for testing in a novel reaction.

8. The effect of Bd fungal metabolites on planarian behavior and developmental regeneration.

Gretchen Hilt, Tomasina Cardone, Michelle Roux-Osovitz

The fungus *Batrachochytrium dendrobatidis* (Bd), is a major threat to amphibian biodiversity across the globe. This pathogenic microorganism is capable of decimating populations of amphibians with the spread of swimming zoospores throughout freshwater environments. Even though this pathogen has been eradicating populations for decades, attempts to suppress the infections have been unsuccessful. Our research question focuses on the recent development

and use of a prophylactic wildlife vaccination against Bd. However, the risks and effects of this vaccine have not yet been understood in regard to the ecosystem and other organisms in the environment. Our study reports an investigation on the effect of Bd metabolite on a soft-bodied organism found in the same freshwater environment: the planarian worm *Dugesia japonica*. This flatworm is a common organism used in developmental research because of their regenerative processes and extensive studies on behavioral responses to the environment. Here, we present our findings that Bd metabolite exposure has no significant effect on planarian behavior and movement within 24 hrs. and 72 hrs. of exposure. The results presented here will expand our understanding of the impacts of Bd metabolite on freshwater organisms and of Bd metabolite as a safe wildlife vaccine.

9. The cultivable and non-cultivable diversity of *Chondrilla nucula* in Tampa Bay

Sophia Carranza, Haydn Rubelmann

Chondrilla nucula, or the chicken-liver sponge, is a species of sponge that is native to Tampa Bay. *C. nucula* is more broadly found throughout the Caribbean and Mediterranean. The few studies done on the fungi from *C. nucula* have only been from Mediterranean sponges. Currently, there is no study characterizing the complete diversity of fungi from *C. nucula*. Here, we set out to describe the complete fungal diversity of several populations of *C. nucula* within Tampa Bay. Specifically, the goal of this study is to collect multiple *C. nucula* from 3 different sites within Tampa Bay and identify the fungal communities residing on each individual sponge. This was done by DNA sequencing as well as cultivating fungal isolates. Collectively, analysis of the fungal communities was evaluated to make conclusions about the fungal diversity at sample sites. Marine fungi are known to produce many natural products which are beneficial to humans, including antibiotics. Knowledge of the richness and diversity of marine fungi from *C. nucula* within Tampa Bay may lead to new fungal isolates that can be tested for natural products. This study will be the first study to describe the complete fungal diversity of the chicken-liver sponge.

10. Disruption of a coastal nutrient cycle by an invasive species

Ashley Fitzgerald, Kristian Taylor

Mangrove crabs (*Aratus pisonii*) feed on mangrove leaves in coastal ecosystems. The resultant detrital and fecal material powers an ecologically important nutrient cycle. Brazilian peppertree (*Schinus terebinthifolius*) is an invasive species capable of displacing native mangroves. This study focused on interactions between *A. pisonii* and leaves from *S. terebinthifolius* and red mangroves (*Rhizophora mangle*). Interactions were analyzed with videos of crab herbivory and analysis of leaf consumption. Mangrove crabs interacted with Brazilian peppertree and foraged briefly when only peppertree leaves were provided. With both plant species present, crabs preferred *R. mangle* leaves although foraging instances on *S. terebinthifolius* were observed. In-situ observations were performed to determine if crabs were utilizing the invasive tree. No *A. pisonii* were found on 213 surveyed peppertrees. This demonstrates the potential impacts of peppertrees within coastal habitats. Crabs fed upon *S. terebinthifolius* leaves in a laboratory setting, with a demonstrated preference for *R. mangle*, but not in their natural habitat. Further

work is necessary to elucidate this invasive's role in coastal nutrient cycling facilitated by *A. pisonii*. If a strong preference for red mangrove leaves is established, this may affect the distribution of mangrove crabs and nutrient cycling as the peppertree further invades mangrove habitats.

11. Can internet access help people with disabilities engage in more physical activity? An analysis of 2017 BRFSS

Madison Kasala, Willie Leung

Various intervention studies have demonstrated that positive behavior changes such as increased physical activity are prevalent with internet access. Having internet access could lead to the enhancement of physical activity for all individuals. However, there is currently limited literature pertaining to the relationship between physical activity and internet access among individuals with disabilities. The purpose of this study is to evaluate the association between internet access and physical activity levels among people with and without disabilities using a free-living setting dataset. This is a cross-sectional secondary data analysis using the 2017 Behavioral Risk Factor Surveillance System with a sample size of 8259 individuals and weighted 23.20% (95% CI [22.93, 23.47]) of participants identified as experiencing disabilities. Physical activity-related variables were regressed on disability status, access to the internet, and the interaction term between the two variables to determine the association using survey analysis. Across the sample, 84.14% (95% CI [83.91, 84.37]) reported having access to the internet. For people without disabilities, 88.24 (95% CI [88.00, 88.49]) reported accessing the internet compared to 70.55% (95% CI [69.68, 71.12]) of people with disabilities. A higher proportion of people without disabilities reported having internet access than people with disabilities ($F_{1, 442564} = 4036.3$, $p < .01$). The results found people with internet access were more likely to engage in leisure physical activity (OR=2.19, 95% CI [2.08, 2.31]), people with disabilities were less likely to engage in leisure physical activity (OR=0.49, 95% CI [0.46, 0.52]), and a statistically significant interaction between the variables ($p < .01$). From the linear regression, it was found that people with internet access and people with disabilities had lower physical activity per week (min) and a statistically significant interaction between the variables ($p < .01$). People with disabilities were less likely to engage in physical activity when they do not have internet access, they were more even less likely to engage in physical activity. This suggested that internet access might be a social determinant for physical activity engagement among people with and without disabilities. There is a need for further evaluation of how internet access impacts physical activity participation among people with and without disabilities.

12. Application of High Resolution UPLC-MS-MS Towards the Prioritization of Marine Bacteria-Derived Crude Extracts for Natural Product Drug Discovery

Megan Rothenberg, Jake L. Belli, Christine M. Theodore

Natural products are a prolific source of new pharmaceutical drug leads. Prioritization of organisms and extracts to maximize efficiency and success rate is an enduring struggle in the utilization of natural products in the drug discovery process. One evolving method is the application of tandem mass spectrometry (MS/MS) data sets for high-throughput prioritization.

In this project, a methodology using UPLC-MS-MS to prioritize marine bacteria-derived natural product extracts for further chemical and biological investigations was developed by utilizing statistical analysis, molecular networking, and free online crowd-sourced tools. This work provides a proof of concept for the use of high-level MS data sets in the undergraduate research laboratory.

13. Ecophysiology of Psammophytic Macroalgae Beneath Mangroves

Eamon Hennessy, Kevin S. Beach

Boodleopsis and *Cladophora* are two genera of turf macroalgae that stabilize the sediment in fringing mangrove forests in Tampa Bay. *Boodleopsis* is associated with higher canopy cover. The effects of desiccation and irradiance were explored as potential drivers of this distribution pattern. Experiments were conducted to determine desiccation potential and tissue dehydration in situ as well as photosynthetic performance during simulated emersion. The microhabitats in which *Boodleopsis* and *Cladophora* were found showed differences in desiccation potential ($p < 0.05$), and *Cladophora* tissues lost more relative water content during low tide in situ ($p < 0.05$). However, photosynthetic performance between the two seaweeds while drying did not differ ($p > 0.05$). At two of three sites sampled, *Boodleopsis* received lower levels of irradiance than *Cladophora* ($p < 0.05$). Photosynthetic responses to various levels of light were measured over one month, after which pigments were analyzed. Photosynthetic yield was significantly reduced in both genera when exposed to high light levels ($p < 0.05$). No significant differences in pigment concentrations between light treatments were found ($p > 0.05$). Because neither alga outperformed the other when desiccated to the same degree, it is likely that irradiance is the primary factor determining the distribution pattern.

14. Seasonal Assessment of Local Tampa Bay Nudibranch Species, *Dondice jupiteriensis*.

Erika Molina, Julia R. Piper, Samantha A. Schlegel, Daniela Gutierrez-Andrade, Louis J. Ambrosio, Michael L. Middlebrooks

There is limited documentation on the life history and distribution of heterobranch sea slugs in scientific literature. Populations of sea slugs are difficult to study, as these animals are often rare and hard to observe. *Dondice jupiteriensis* is an Aeolid nudibranch native to Florida and is found locally in Tampa Bay. *Dondice jupiteriensis* is often found feeding on the polyps of the hydroid, *Eudendrium carneum*. Despite the relative abundance of *D. jupiteriensis* in the Tampa Bay region, there is little information on their life history and seasonal population dynamics. In 2021, a year-long study was launched to document the changes of *D. jupiteriensis* on *E. carneum* throughout the year. Each month, four hydroid colonies were collected from Lower Tampa Bay. All observed sea slugs were identified to species and measured. To obtain colony density measures of *D. jupiteriensis*, total dry weight of hydroid was used. A total of 14 different heterobranch sea slug species were identified during this study with the highest species richness recorded in June 2021. The highest colony density and smallest mean size of *D. jupiteriensis* were both observed in the summer months. This suggests that major spawning events occur in late spring and early summer. This study provides an infrequent opportunity to

gain insight on nudibranch population dynamics as well as provide important preliminary research to uncover the life history of *D. jupiteriensis*.

15. Can wearable devices promote physical activity among people with intellectual and developmental disabilities?: A meta-analysis approach

Gracie Bent, Mia Dalton, Maria Gomez, Willie Leung

Individuals with intellectual and developmental disabilities (IDD) are more likely than typically developed peers to engage in sedentary behaviors and are less likely to meet the current physical activity levels. Wearable devices could potentially use to promote physical activity among this population. There is a lack of comprehensive literature on the effectiveness of wearable devices in promoting physical activity. Therefore, the purpose of this study is to examine the effects of interventions that utilize wearable devices on physical activity levels among people with IDD with meta-analysis techniques. Four databases (PubMed, SPORTDiscus, Web of Science, and PsycINFO) were searched for relevant literature with the key terms related to wearable devices, physical activity, and IDD. A total of 2234 articles were screened, with eight articles found to meet the inclusion criteria of using wearable devices in physical activity interventions and including people with IDD. Using the random effect model in the meta-analysis, 11 effect sizes from the eight included articles; it was found that using wearable devices promoted physical activity among people with IDD (Hedges' $g=0.43$, 95% CI [0.02, 0.84], $p=.04$). Based on the funnel plot and Egger's regression, publication bias was not found among the included studies. Moderator analysis found that types of wearable devices (research graded vs. consumer graded) and having additional strategies (i.e., one-on-one consulting, diet plan, education classes, etc.) influenced the relationship between wearable devices and physical activity. Using wearable devices could lead to the promotion of physical activity among people with disabilities. With the increasing popularity of wearable devices, there is a need to promote wearable devices among people with IDD to continue promoting physical activity. This could potentially decrease the gap in physical activity disparities between people with and without IDD.

16. Exploring Rare Earth Element Extraction and Luminescence Properties of Novel Ligand Systems

Victoria D. Pacanowski, Erin Kelly, Bailey J. Lake, Eric J. Werner

The acquisition of f-elements from natural sources and discarded consumer products has recently garnered attention due to their extensive high-tech applications. One application specifically of the rare earth elements (REEs) explored in this study requires complexing the metal ion with a suitable organic molecule to develop luminescent compounds as biomedical sensors. To obtain the relevant metals (e.g., Eu and Tb), improved procedures for separating REEs, which are notoriously difficult to separate and isolate in pure form, are therefore required. This study focuses on liquid-liquid extraction methods utilizing a tripodal ligand with three carbamoylmethylphosphine oxide (CMPO) groups attached to a tris-alkylamine capping scaffold. The extraction process involves pulling the metal from the aqueous to organic phase as the ligand binds the metal ion. Modifications of this process have led to different extraction

selectivity across the REE series. In addition to developing improved REE extraction methods, further luminescent sensor applications of the isolated metals are also being pursued in our lab. For example, stable macrocyclic REE complexes enable utilization in a variety of biomedical and sensor applications. This presentation will also describe new luminescent macrocyclic REE complexes consisting of a tetraiminodiphenolate (TIDP) ligand and its structural variation.

17. Secondary data analysis of physical activity levels between wearable device users and nonusers living with diabetes: 2017 BRFSS

Rachel Frias, Kim Vo, McKenzie Clough, Willie Leung

There are many health benefits to individuals with diabetes engaging in physical activity. Previous studies have demonstrated the effectiveness of using wearable devices in promoting physical activity among people with chronic conditions. Currently, limited literature studies the relationship between wearable devices and physical activity among individuals with diabetes in free-living settings. This study aims to examine the association between wearing wearable device use and physical activity levels among people living with diabetes with the hypothesis that using wearable devices could increase physical activity. The current study utilized the data from eight states of the 2017 Behavioral Risk Factors Surveillance System (BRFSS). The sample consisted of 1298 adults with diabetes who used and did not use wearable devices. Participants' physical activity per week (min) served as the dependent variable for the current study. Descriptive analyses were conducted to describe the sample. Unadjusted and adjusted linear regression was performed to determine the association between physical activity per week (mins) and wearable device usage (users and nonusers). 84.97% (95% CI [80.39, 88.89]) of participants reported as nonusers of wearable devices, while 15.03% (95% CI [11.11, 19.61]) were users. Across the sample, the average weekly physical activity was 427.39 mins (95% CI [356.43, 498.35]). Nonusers had a higher physical activity per week with 433.83 mins (95% CI [353.59, 514.07]), while users only had 392.59 mins (95% CI [253.48, 531.69]) of physical activity per week. However, the differences between the two groups were non-statistically significant ($p=.61$). In both adjusted and unadjusted linear regressions between physical activity per week and wearable device status, statistically significant associations were not found (unadjusted: $\beta=-41.24$, $p=.62$; adjusted: $\beta=-56.41$, $p=.59$). The results of this study found there was no association between using wearable devices and physical activity levels among people living with diabetes. Further research is needed to determine the effectiveness of wearable devices in promoting physical activity among people with diabetes. Additionally, there is a need to determine how people with diabetes use wearable devices that could increase physical activity levels.

18. Geographic Variability in Antarctic Dense Shelf Water Temperature and Salinity Trends

Samantha Schlegel, Kimberly Dobrinski

Dense Shelf Water that forms on the continental margin of Antarctica is the precursor to Antarctic Bottom Water. Filling vast expanses of the deep sea worldwide, Antarctic Bottom Water strongly influences global ocean circulations, climate processes, biogeochemical cycles, and biological productivity. At three locations, changes in Dense Shelf Water temperature and

salinity over nearly four decades were examined using data from water column profiles made by Conductivity, Temperature, and Depth (CTD) sensors and ARGO floats. Ross Sea temperature and salinity decreased from 1983-2000 and increased thereafter, while Prydz Bay temperature and salinity has decreased from 1982 to the present. In the Weddell Sea, no significant trends were observed. Trends vary geographically based on differing conditions such as glacial meltwater, sea ice formation, atmospheric processes, wind strength and direction, ocean currents, and bathymetry. Complex Southern Ocean systems deserve continued study because Dense Shelf Water around Antarctica is not following identical temporal patterns, with implications for different sinking rates, physical characteristics, and thus global distribution of Antarctic Bottom Water.

19. An Analysis of Foot Strength Variation in Ecotypes of the Sea Slug *Elysia Crispata*

Julia Piper, Erika N. Molina, Samantha A. Schlegel, Grace Ferguson

Elysia crispata is a photosynthetic sacoglossan sea slug with two morphologically distinct ecotypes. The mangrove or clarki ecotype typically lives in low wave energy mangrove swamps and adjacent habitats and has a thin green foot. The coral reef or crispata ecotype lives on coral reefs and coral rubble in higher wave energy environments and have a thicker opaque white foot. Due to these morphological differences a study was launched to compare the relative foot strength of each ecotype. Specimens of each ecotype were collected from Key Largo, FL USA. Fifteen individuals from each ecotype were tested using a flume apparatus filled with artificial seawater and tuned to create varying strengths of waterflow. Slugs were placed individually within the flume on a natural limestone tile and then subjected to experimental flow velocities. The length of time the slug withstood this flow before they were dislodged as well as the velocity of the flow during dislodgement was recorded. Each slug was tested four times, for a total of 60 trials per ecotype. For the clarki ecotype, slugs failed to be dislodged by the water flow in 32 of the trials. Of those dislodged the mean time withstood was 65.21 ± 25.24 seconds. For the crispata ecotype, slugs failed to be dislodged by water flow in 18 of the trials. Of the slugs that were dislodged by water flow the mean time withstood was 31.24 ± 23.35 seconds. This is surprising as the crispata ecotype was expected to be better able to adhere to surfaces due to its higher energy environment and more muscular foot. Failure to dislodge might be attributed to an increased mucus production in the clarki ecotype that allowed them to better adhere to the limestone rather than rely solely on foot strength.

20. Zooplankton Distribution, Abundance, and Biodiversity in Tampa Bay

Jonah Jimmerson, Rebecca Waggett

Zooplankton are some of the smallest animals that can be found in the oceans, but they serve as a vital trophic link between phytoplanktonic primary producers and larger carnivores that make up the trophic web above them. The health and diversity of zooplankton can be directly correlated to the quantities of resources available for larger marine organisms. Tampa Bay is a large, shallow estuary on Florida's Gulf Coast that is both ecologically and economically important. Because zooplankton can act as an indicator for the health of coastal ecosystems,

studying the ongoing trends of zooplankton in Tampa Bay could give insight into the condition of the broader ecosystem. For this study, samples have been collected from multiple locations throughout Tampa Bay over several years to be observed. This data was then compared to historic zooplankton diversity patterns in order to establish a reference for the current trends that we have observed. We have seen that overall abundances tend to be greatest in the late summer and fall seasons, especially in later years. Furthermore, the diversity indices have indicated that crustaceans – particularly calanoid and cyclopoid copepods – were frequently the most abundant taxa, though there was significant variation across seasons and sampling locations.

21. Uranium Distributions along Two Rivers in Tampa Bay, Florida

Allison Patys

Uranium is a naturally occurring, radioactive element that is commonly associated with phosphate deposits. A large region of central Florida is actively mined for phosphate to produce fertilizer, and therefore may contain elevated levels of uranium. The primary pathway for the uranium in these deposits to be transported to the local rivers is via groundwater. The rivers that discharge into Tampa Bay, the largest open-water estuary in Florida, are directly fed by several springs that are connected to this groundwater. The majority of the freshwater flow to the Bay is provided by the Hillsborough and the Alafia Rivers. The estuarine mixing zones for both of these rivers, during the wet and dry seasons, were surveyed for uranium distributions. Prior to analysis on an ICP-AES, the uranium in the river water was preconcentrated using UTEVA resin (Eichrom Technologies) to improve the detection limit. In general, the Tampa Bay rivers have uranium concentrations that are two to three times greater than the average concentration in global rivers and estuaries. Sulphur Springs may have a slight influence on the Hillsborough River during the dry season when the spring water is pumped to the base of the Hillsborough Dam to increase the freshwater flow of the river.

22. Student Confidence in University Response to Unwanted Sexual Contact and Violence

Kaitlyn Anderson, Kelsey Higgins, Caroline Carson, Jack Dodds, Tracy Zontek

The purpose of this presentation is to identify and describe the gaps in undergraduate student confidence levels in university response to sexual harassment. This presentation will analyze general patterns regarding student confidence, and identify deeper connections involving demographic characteristics. A secondary data analysis was conducted utilizing the results from the Victim Advocacy Survey that was administered to students at the University of Tampa in 2019 and 2021. Differing levels of confidence surrounding university action towards sexual violence were observed. Significant differences in confidence regarding university crisis management abilities and perceptions of activities towards the protection of student safety were noted between student demographics. These demographics included class year, Greek affiliation, gender, sexual orientation, race and between the 2019 and 2021 school years. These discrepancies are consistent with literature findings. Greek-affiliated students experience a greater rate of sexism and sexual violence than the general student population, and thus may have had greater exposure to university handlings of these situations. Furthermore, COVID-19

may have impacted confidence levels between class years and between 2019 and 2021 data sets. Discrepancies in confidence between class years may result from upperclassmen having first-hand experience with university crisis action.

23. Response and resilience of *Montastraea cavernosa* from Bermuda to a simulated thermal stress event

Jada Brown, Samantha de Putron

Corals affected by thermal stress can experience an imbalance in the symbiotic community resulting in bleaching. Bermuda reefs have high coral cover compared to other reefs in the Caribbean due to greater seasonal variance. To assess the current resilience of *Montastraea cavernosa*, fragments of six colonies were put through a simulated thermal stress event. During the experiment the following parameters were measured at different time points to determine coral responses: photosynthetic efficiency, bleaching score, gross photosynthesis, and respiration rates. Fragment responses differed over time point and colony for bleaching score. Results from the other parameters deviated from hypothesized trends likely due to smaller sample sizes. Understanding how *Montastraea cavernosa* in Bermuda responds to thermal stress is important to comparing how different species in Bermuda respond to thermal stress and how they compare to other regions of Caribbean.

24. Visual Survey of the Effects of Surface Area on the Number of Metacercarial Cysts on Fishes in the Stream in Plant Park

Courtney Peden, Abby Young, Kaitlin Keane, Olivia Hernandez, Emily Durkin

In this experiment, traps were used to collect fish from the stream in Plant Park in order to see how fish surface area relates to the number of parasitic metacercarial cysts on or in the fish. Over the course of two days, 12 traps were set in the stream and 108 fish were collected, observed for cysts, and their height and length measured. The surface area of the fishes were calculated using the formula for the surface area of the cylinder. This experiment found that of the species collected, the Sheepshead Minnow was most likely to be infected, but the Eastern Mosquitofish had a higher mean intensity. The frequency distribution displayed a negative binomial distribution. A majority of the fish that had at least one cysts were medium sized (surface area between 40 and 80 square centimeters), and the fish with the highest parasite load, 4 cysts, was medium sized as well. It was discovered that there is no correlation between the size of the fish and the parasite load.

25. An Exploration of Perceived Positive and Negative Effects from Vaping Among College Students

Tara O'Connor, Ryan Randecker, Mary Martinasek

Background: Electronic cigarettes produce a number of harmful chemicals that have been linked to adverse health effects including lung and cardiovascular diseases. This exploratory study aimed to explore positive and negative effects students experienced with e-cigarette use across two universities.

Methods: A cross-sectional study was conducted with U.S. and German college students (n=596). The study consisted of an online Qualtrics™ survey regarding usage, access, and effects of vaping administered through Qualtrics. Descriptive statistics were conducted using SPSS version 28.

Results: When asked about what positive experiences students had with vaping in the past 30 days, the most frequent responses were nicotine high (12.9%), head rush (12.2%), it helps them concentrate (7.6%), and love of flavors (6.2%). When asked about negative experiences, the most frequent responses were addiction (18.1%), coughing (13.8%), cost (13.6%), and headache (10.7%). There was a positive correlation between appetite and frequency of vape use ($p=0.04$, $r=0.161$).

Discussion: Overall students self-reported negative experiences more frequently than positive. Addiction was the most frequently reported experience which suggests that students are aware of the harms of e-cigarettes, but continue to vape, possibly due to the positive effects.

26. Transcreation: Aiming for Cultural and Linguistic Accuracy

Olivia Osseiran, Hailey Daves, Mary Madelyn Hart, Emma Kotelnicki, Victoria Meguro, Jusmary Mercado, Claudia Aguado Loi

Latina breast cancer survivors, a known vulnerable population, have specified survivorship needs that historically lack well-tailored coping and management models. The study aims to evaluate the development of curriculum materials for a Latina breast cancer survivor intervention in Tampa Bay. Curriculum development evaluation is necessary to ensure the effectiveness of educational materials for specific target populations. Module development and creation followed the guidelines of the American Cancer Society and the National Cancer Institute. Cultural relevancy and module efficacy were screened through expert consultation in the creation process and pilot testing through focus groups prior to module application. This research will assess the efficacy of transcreation in building intervention materials specified to the Latina breast cancer survivor demographic. By using transcreation to develop this health coaching intervention, cultural and linguistic accuracy can be ensured, resulting in more effective promotion of health behaviors and overall health outcomes.

27. Microbiome analysis of photosynthetic sea slug, *Elysia papillosa*

Jada Brown, Padmanabhan Mahadevan, Michael Middlebrooks

Sacoglossans, known as “solar-powered sea slugs”, are a group of marine gastropods that have the unique ability to photosynthesis through stealing functional chloroplasts from algae. *Elysia papillosa* can rely solely on photosynthesis and survive for up to two weeks without a food source. The microbiome of these slugs is crucial for their metabolism, immunity, development, but more importantly their photosynthesis. Full metagenomic analysis was conducted on four samples of *Elysia papillosa*. Sequences were classified with Kraken2 and relative abundances were calculated with Bracken. Bacteria was analyzed by taxonomic groups and hypothesized function to the sea slug was determined with extensive literature analysis. All samples were dominated by phyla Proteobacteria and Firmicutes. Other phyla present in all samples included Actinobacteria, Cyanobacteria, Bacteroidetes, and Tenericutes. Samples had high abundance in

Bacillus subtilis known to produce cellulase. It is possible that this bacterium could assist in degradation of cellulose in plant cell walls for access to chloroplasts. Other abundant species that dominated samples, such as *Escherichia coli*, were hypothesized to be present due to freshwater and human inputs at the collection site.

28. A Comparison of Backyard Broods, Surveying the Occurrence of Parasitic Eggs in Fecal Samples of Chickens.

Jeannette Bacchia, Mallory Kozik, Grace McGuire, Emily Durkin

The objective of this study was to identify how different backyard brood maintenance techniques affect the occurrence of parasitic eggs in the fecal samples of chickens. Owning and housing chickens on your property offers many benefits but also requires responsibility to maintain the health of the flock. Parasitic infections can pose health risks to the flock and chickens may even die from a severe infections. Using the Sheather's sugar flotation technique, fecal samples were analyzed and the presence and quantity of parasitic eggs were recorded in order to determine the average egg count per gram of feces (EPG). Fecal analysis displayed the presence of suspected threadworm eggs in the feces of brood one, and the presence of suspected tapeworm and cecal worm eggs in the feces of brood two. It is suspected that the exposure to various wildlife is a contributing factor to the different parasitic infections the two broods harbor. Backyard broods and parasites will always share a close relationship, it is simply a matter of balancing the parasites presence while maintaining the health of the brood. Maintenance techniques such as coop rotation and elevated food and water are simple techniques that owners can implement to create this balance.

29. Developing an Organic Electrochemistry Undergraduate Lab for Organic Chemistry II

Christopher Theodoropoulos, Ashley Longstreet

Organic electrochemistry is an exponentially growing field due to its ability to perform highly selective transformations of molecules under mild conditions. Despite its importance, organic electrochemistry is a topic which remains largely unexplored at the undergraduate level. Therefore, the goal of this project is to develop an electrochemical experiment that undergraduate organic chemistry students will perform in Organic Chemistry II lab. An experiment that is suitable for undergraduates must be simple to perform, safe, cost-effective, and take no more than 3 hours to complete due to the time constraints of lab periods. As such, the goal for this project is to modify known electrochemical reactions to be performed on an IKA ElectraSyn 2.0, a device that simplifies the electrochemistry setup and can be used by undergraduate students. The two reactions investigated were the carboxylation of 1-chloroethyl benzene into 2-phenyl propionic acid and the oxidation of benzhydrol. Currently, no product has been observed for the carboxylation of 1-chloroethyl benzene. The oxidation of benzhydrol was more successful where 5 – 15% conversion of benzhydrol to the desired product was observed with a 30 min reaction time. Optimization for this reaction will continue until >90% yield of the product could be obtained to make this experiment suitable for undergraduate students.

30. Assessing mobile predator populations in Tampa Bay using Baited Remote Underwater Video

William Love IV, Georgia Ambrose, Latyr McQuarters, Heather Mason

Traditional methods to study underwater communities focus on direct capture methods like trawling or underwater dive surveys, which either alter the ecosystem or introduce the effect of humans as part of the landscape. Remote video technologies are being developed worldwide as a tool to survey underwater community structure. While highly developed techniques are already in use in the southern hemisphere standardized methodology is yet to be established in the northern hemisphere. In this study, we utilized baited remote under water (BRUV) units to use to survey underwater seagrass and open bottom habitats to investigate changes in mobile predator populations over time in Tampa Bay. In addition, we assessed water chemistry and turbidity levels to determine the utility of the technique across a range of water quality parameters. Finally, these surveys are being used to standardize survey efforts and create a video catalog for behavioral studies of underwater organisms.

31. Investigation of the Gene Transcription Modifications Associated with Obesity in Zebrafish (*Danio rerio*)

Briana Alston, Jordan Gran, Kimberly Dobrinski

This study investigates transcriptional changes in the model organism, *Danio rerio* (zebrafish), associated with obesity. Zebrafish were fed separate diets to raise obese fish and normal weight fish for liver dissection. RNA Seq was run using Novaseq s4000 cycle to obtain short read sequences and transcriptional differences that were evaluated using the following python tools: Trimalore, STAR, docker, BLAST, Stringtie, Orfipy. This pipeline was used with gene ontology analysis for a functional comparison of the transcription data. Zebrafish are an excellent model organism for obesity as they share a considerable amount of genetic identity with humans. Additionally, zebrafish organ systems are also similar to human systems. Metabolic control in zebrafish is similar to humans including appetite circuits in the hypothalamus, as well as the pancreas and insulin-sensitive tissues: liver, muscle and white adipose tissue. Zebrafish, similar to mammals, store excess nutrients in white adipocytes. Obesity has been shown to be associated with disease such as diabetes and non-alcoholic fatty liver disease. This study will use the model organism, zebrafish, to explore the contributions obesity may play in formation of disease

32. Substance Use including the following: alcohol, smokeless tobacco, e-cigarettes, cigarettes and marijuana on the Health Status of College Students

Morgan Gray, Willie Leung

Abstract:

Background: The rise of e-cigarettes and the legalization of recreational marijuana contributed to the rise of substance use among college-aged individuals, in addition to alcohol, smokeless tobacco, and cigarettes. Substance use among college-aged individuals could have implications on their overall health.

Objective: This study aimed to examine the association between substance use of alcohol, smokeless tobacco, e-cigarettes, cigarettes, and marijuana and overall health status among college-aged individuals aged 18 to 22 in free-living settings.

Method: Using the 2020-2021 Behavioral Risk Factor Surveillance System, a total of 4,825 participants were included in the analysis. Participants were classified into two groups, substance users and nonusers. Participants who reported currently consumed alcohol, smokeless tobacco, e-cigarettes, cigarettes, and marijuana, were considered substance users, while participants who did not currently use any substances were considered nonusers. Health statuses were estimated in two ways, self-related health (excellent, very good, good vs. fair and poor) and number of healthy days without physical and mental illness. Descriptive analyses and regressions were performed to estimate the association between the variables among college-aged individuals.

Results: Higher proportion of non-substance users (92.84%, 95% CI [91.22, 94.44]) reported having excellent, very good, and good health in compared to substance users (90.82%, 95% CI [89.30, 92.40]). However, the difference was not statistically significant ($p=.08$). Non-substance users had higher average number of healthy days (26.14, 95% CI [25.68, 26.59]) compared to substance users (25.06, 95% CI [24.59, 25.52]) ($p=.01$). While the logistic regression found no statistically significant association between substance use and self-rated health status, the linear regression found substance users had less healthy days ($b=-1.43$, $p=.001$).

Conclusion: Among college aged individuals, using any substances could lead to worsen health. Further research is needed to examine how the frequency of substances used could lead to the severity of health status.

33. Potential Picasso: The Chemical Analysis of a Painting with Unknown Origins

Clarissandra Braun, Christine Theodore

In the spring of 2021, a painting signed and dated "Picasso 1905" was submitted to the University of Tampa for the purpose of investigating the provenance, material composition, and potential attribution of the artwork in question. In collaboration with art historians, an extensive review of the historical and chemical literature on Picasso's works was done to determine the common pigments, binders, and canvases in use by the artist in the early 1900s. Method development was conducted using known standards and pigments which were digested and run on the ICP-OES. These results were compared to various pieces extracted from the painting in question which appeared to indicate anachronistic materials. A handheld XRF, IR

camera, and UV light source were used as a noninvasive way to collect more data on the elements present within the pigments and the artwork. The information obtained from these experiments was used in conjunction with stylistic analyses to make suggestions for the next steps of analysis.

34. Not Putting Your Foot in Your Mouth: Comparison of Diversity in Florida and California Academies of Sciences

Michaela Sweeney, Jillian Arzoumanian, Justin Child, Jen Wortham

Past research reports minimal authorship diversity in research journals, with males having more publications, co-authors, and single authored papers. No study has tracked diversity in authorship from the journal's inception. The Florida Academy of Sciences and California Academy of Sciences publish regional journals covering social and natural sciences. Florida lacks diversity objectives and statements, whereas California has had diversity objectives for over a century. Tracking the authorship diversity in these two vastly different journals can determine if organizations and research journals are progressing in diversity and being inclusive. The objective of this research was to determine if having diversity objectives results in the outcome of improved diversity. California was predicted to have more diversity in authorship over Florida in all measurable variables. Authorship data was collected such as the number: of males and female authors, first authors, single authors, and co-authors; of publications from government agencies versus universities; of publications from in-state versus out of state; and of publications per year and pages published. Florida showed more diversity in all variables but one, suggesting that California was not succeeding in diversity of authorship despite having gender diversity goals for over 100 years. Areas of improvements for both organizations are discussed.

35. Brachial Plexus 3D Models in Anatomy Education: Varying Complexity to Facilitate Learning

Jacob Prior, Mason Meers

Within the nervous system, some of the most complex areas to learn about are junctions between multiple nerves called plexuses. The human brachial plexus consists of five spinal nerves that fuse and separate repeatedly within the upper limb, generating many smaller nerves. This can be a difficult area for a student to learn because of the number of nerves present and occasional inconsistencies of location between visual depictions and dissections. Despite the clinical importance and complex structure of the brachial plexus, there are few commercial models available. However, with the increased accessibility of 3D printing technology, the potential exists for increased, affordable access to physical models of the brachial plexus. Scientifically accurate models can be made available to provide physical or virtual models for study. Moreover, model designers can vary the complexity and detail of models to suit different needs, such as for undergraduate or graduate education. We describe the design and creation of 3D brachial plexus models of varying complexity intended for a study on their efficacy in undergraduate anatomy education. This presentation explores the

preliminary steps in studying the potential benefits and variety of approaches to giving students access to custom 3D models of complex structures.

36. The Visual Pigments of Syngnathidae and their Role in Ecology

Quinn Donahue, Jeffry Fasick

The spectral tuning properties in rod (RH1) visual pigments of different pipefish (*Syngnathus*) and seahorse (*Hippocampus*) species were examined to determine their absorbance maximum for RH1. Predicted rhodopsin sequences were obtained from the National Center for Biotechnology Information and their amino acid sequences were used to identify and compare key spectral tuning positions between each fish species and cow (Bovine) rhodopsin as a control. Out of eighteen critical amino acid positions, the pipefish and seahorses had key changes in relation to the cow at positions 83, 292, and 299 that indicated shifts in the absorbance maximum. To further examine the key changes, amino acid sequences were run through LOMETS to model and compare respective protein structures. These models were examined in Pymol and the distance between the Schiff- base nitrogen of the opsin protein to key residues were measured to further identify changes in RH1 pigments. We propose that the spectral tuning properties of the RH1 pigments in pipefish and seahorses have changed to adapt to a specific foraging strategy. In the future we can look at the cone pigments to further examine how visual pigments in pipefish and seahorses play a role in foraging ecology of these fish.

37. Analysis and genetic identification of unknown microbes at the University of Tampa

Grayson A. O'Brien, Victoria Tavares, Ann H. Williams

Anyone who has been to the University of Tampa has seen the breathtaking water fountain outside of Plant Hall. Many students sit, take photos, or study in that area, but is it safe to dip your hand or foot into that water source? We sampled and isolated microorganisms from the water fountain both from the top and bottom of the water column. Water samples were collected and filtered on Nutrient agar, Mannitol Salt agar, MacConkey agar, and Thiosulfate-Citrate-Bile Salts-Sucrose agar plates. Two colonies were isolated in the NA plate, four in the MSA plate, two in the MAC plate, and one in the TCBS plate. The MSA showed a yellow color change and the TCBS showed an orange color change. Gram Stain showed gram-negative cocci in the TCBS, NA, and MAC. The MSA was divided into 4 quadrants, three sections turned out to be Gram-positive cocci and one showed Gram-negative rods. The antibiotic susceptibility pattern was determined for the isolates using the Kirby-Bauer method, the antibiotics used were Novobiocin, tetracycline, kanamycin, and Penicillin. Isolates were further tested using Biochemical tests such as the Enteropluri tubes. Preliminary results indicate the isolation of *Shigella* serogroup C and *Salmonella*. More results such as BIOLOG testing will help analyze any antibiotic-resistant bacteria, helping The Universities's community.

38. Assessing Plasticity of *Halimeda incrassata* Through Change in Water Motion

Matilda Newell, Kevin S. Beach

There are many different variables that can change the morphology and physiology of macro-Algae, such as, water motion, herbivory, salinity, irradiance, and temperature. The focus of this study was how water motion affects *Halimeda incrassata*. For this study, the *Halimeda* was collected from locations along the West coast of Florida down to the Florida Keys. This study aimed to compare the morphological and physiological differences between the three locations to see if changes in the environment create significant differences in the *Halimeda* and to see if these differences were minimized growing in a common garden. Some measurements of morphology and physiology like height of the *Halimeda* and the surface area were found to be significantly different between different locations and locations compared with their common garden. This study shows that there are some significant changes in the morphology and physiology of the *Halimeda* due to variabilities in the environment conditions from the three locations. This will help further understand what factors play a part of the plasticity of *Halimeda*.

39. Prevalence of Intestinal Parasites in Local Dog Parks

Rebecca Velasco, Alaina Whelan, Faviola Collazo, Emily Durkin

Gastrointestinal parasites are ubiquitous in domestic dogs. A heavy infection of parasites in dogs can cause severe symptoms such as anemia, vomiting, diarrhea, and in some severe cases, death. Parasites are the most prevalent in dogs not on prevention and frequently attend dog parks. In this study, fecal samples were obtained from four local dog parks in Tampa Bay, two in lower-income neighborhoods and two in higher-income neighborhoods, to determine the prevalence of intestinal parasites among dog parks. It hypothesized that there would be a higher number of intestinal parasites in dog parks located in low-income neighborhoods compared to those in middle/high-income neighborhoods. Our results included one *Ancylostoma caninum*-positive fecal float sample and one *Trichuris vulpine*-positive fecal float from Al Lopez dog park. All other samples for both fecal floats and direct smears were negative. This study suggests preventive measures, such as awareness of intestinal parasite infections, their effects on dogs, and increasing waste management, can lower parasite prevalence in low-income dog parks.

40. Effects of heat stress on the physiological characteristics of *Lactobacillus rhamnosus*

Lilian Da Silva, Louis J. Ambrosio

The ability of microorganisms to adapt to environmental stressors is essential for their survival and growth in various settings. However, the response of *Lactobacillus rhamnosus* to environmental stressors, such as changes in temperature, remains poorly understood. Understanding the morphological changes this bacteria undergoes under different temperatures can help develop strategies to enhance its viability and efficacy in various applications. *L. rhamnosus* was isolated from Chobani Greek yogurt and was subjected to heat stress in different temperature regimes ranging from 37°C, 40°C, 45°C, and 50°C during a set

amount of time. When exposed to high-temperature stress they would exhibit a physiological change to survive and adapt to their environment. *L. rhamnosus* was shown to have a shift in morphological appearance in higher temperatures mostly at 45°C and 50°C. There is still a significant knowledge gap in the understanding of the specific morphological changes that *L. rhamnosus* undergoes when under the stress of different temperatures. However, it is one step closer to developing new strategies that can enhance the viability and efficacy of this bacterium in food products.

41. Collaborative Group Exams Benefit Students Regardless of Academic Major

Jillian Arzoumanian, Michelle Roux-Osovitz, Jeffrey M. Grim

Modern pedagogical approaches are adapted to facilitate student learning. "Two-staged" collaborative group exams allow students to work together in collective groups after first attempting an assessment individually. The implementation of collaborative group exams should convert exam-style assessments into learning opportunities focused on improving content retention and learning.

This study measured the effects of collaborative group exams on student performance, learning, and experience in biology courses at the University of Tampa. Collaborative exams were deployed in introductory (4 sections) and upper level (7 sections) courses. Quantitative and qualitative data were recorded from ~418 individual students.

Overall, collaborative exams enhanced student performance, perception, and experience in biology courses at all levels. Collaborative exams reduced test anxiety by 50%, and students expressed an 8% increase in perceived benefits of them over time. Student performance increased by 49% on collaborative exams relative to individual exams.

Our data indicate that students in all course levels and academic majors benefit from collaborative exams. They are exposed to new skills and content during collaborative group exams that are applied to improve their own learning. Therefore, we would suggest that all courses consider incorporating forms of collaborative assessment as a way to enhance student learning and course experience.

42. NASCAR Race or Code Blue: Can Using the Pit Crew Model at the Initiation of a Code Optimize Patient Outcomes?

Alyssa Anderson, Kasandra Brennan, Corryn Eckel, Elizabeth Sassatelli

After gathering background data regarding code blue circumstances, an evidenced based practice research approach was used to compile available literature on the impacts of initiating a code blue with a pit crew model. Replacing ad-hoc code blue teams with the pit crew model has been proven to impact the patient's outcome in a positive manner. The PICO question formulated is, at Bay Pines Veterans Administration Healthcare System, does assigning specific Code Blue roles to staff on acute-care units before each shift result in higher survival-to-discharge rates? Lastly, a plan of implementation is developed and explored.

43. Investigating the Impact of Sonication on the Oral Microbiome and Biofilm Formation

Alisha Poothurail, Grace Spiegelhoff, Isabella Minuta, Eric Freundt

The human mouth is home to numerous microscopic organisms making up complex communities. Collectively, these organisms are referred to as the oral microbiome, and are found on the teeth, gums, tongue, hard tissues of the mouth, and in saliva. Some of these organisms are harmful while others are beneficial. Dental plaque is formed when bacteria adhere to the surface of a tooth and form a community called a biofilm. Since plaque accumulation leads to periodontal disease, these biofilms must be removed regularly through brushing. This study analyzes the effects of sonication on the oral microbiome. Six individuals who use a manual toothbrush were given a sonicating toothbrush and samples were collected prior to changing toothbrushes, and after one week, three weeks, and six weeks. Three individuals continued to use a manual toothbrush and served as a control group. The 16S ribosomal RNA gene sequence was amplified and used to determine microbiome composition, while a biofilm assay was also conducted to see if sonication affected the bacteria's ability to establish biofilms. The results of this study elucidate how sonication affects both the oral microbiome and biofilm formation.

44. What's in Our Water? Identifying uncharacterized bacteria from recreational sites in Tampa Bay

Evelyn Martinez, Maryn Shilale, Jeannette Bacchia, Caitlin Katz, Lauren Logsdon

While bacteria are part of all ecosystems on earth, the presence of pathogenic bacteria such as *Escherichia coli*, *Staphylococcus*, and *Vibrio* species pose a risk to human health. Recreational waterways are monitored for fecal indicator organisms in order to minimize adverse health conditions within the community, but the presence of other pathogens may go undetected. Between 2019 and 2021 a University of Tampa research team sampled different recreational waters across Tampa Bay to test for the presence of *Staphylococcus aureus* and Methicillin resistant *S. aureus* (MRSA) using microbial and genetic tests. Of the samples that displayed common microbial markers for *S. aureus*, many lacked the *S. aureus* genetic marker *NucA*, indicating the presence of other unidentified potentially pathogenic organisms. To identify these uncharacterized organisms, the 16srRNA gene was amplified by PCR and sequenced using the ABI seq studio analyzer system. MEGAx software and the NCBI GenBank database were used to analyze the sequence results, and a variety of genera were identified. Our data suggest the presence of mostly non-pathogenic environmental bacteria such as *Cobetia*, *Exiguobacterium*, *Priestia*, and *Bacillus*, with only a few pathogenic bacteria identified. Here we will present our current findings and discuss our approach to analyzing the diversity of the organisms we have identified. This projects' findings provide insight into the diversity of organisms in Tampa Bay and will help guide new approaches to determining the health and safety of our waterways.

45. Health Coaching Workbook for Latina Breast Cancer Survivors

Emma Kotelnicki, Victoria Meguro, Claudia Aguado-Loi, Melissa Williams

Latina breast cancer survivors (LBCS) historically lack culturally tailored coping and management interventions. This study aims to develop a linguistically and culturally aligned workbook to accompany a health-coach intervention. Following best practices for transcreation, a process guided by the integration of cultural nuances, this study aimed to design culturally and linguistically relevant materials for a health coaching intervention for LBCS. The content for this was informed by theory and evidence-based practices. The materials in this 6-week hybrid intervention consisted of modules and an accompanying workbook focused on key survivorship concerns tailored to the needs of LBCS. This workbook coincided with the content covered in each module. The workbook was used as a tool that offered corresponding module-based information, interactive activities and homework, and additional resources for LBCS to access afterward related to this intervention. The goal of incorporating this workbook into our materials was to provide a device that our participants could access at any point during or following this intervention to receive ancillary knowledge about any of the content covered in the modules.

46. Evidence for tissue damage on flies from mites using SEM

Anngelyk La Luz, Emily Durkin

In nature, many organisms develop symbiotic relationships, such as mutualism, and parasitism, with other organisms. Mite species are commonly involved in symbioses but are understudied, likely due to their small size. *Macrocheles* spp. mites attach to flies for transportation. However, whether the mites damage the fly while attached is unknown. The purpose of this research was to find evidence for whether *Macrocheles* spp. are harming fly hosts using scanning electron microscopy (SEM). Mites were collected from the wild and four populations were generated in the Durkin Lab. Mites from two of the populations were exposed to fly hosts. Those that attached were used for SEM imaging. Through trial and error, I determined the best SEM protocol for imaging using a Jeol JSM-6010 LA analytical SEM. While imaging, we found that fly and mite appendages were obstructing the view of the mite's mouthparts. Thus, whether *Macrocheles* spp. mites damage fly hosts remains unknown. We plan to continue modifying SEM protocols for better images and try other methods, such as bio-staining fly hosts, to determine the exact nature of the relationship between these mites and fly hosts.

47. What's in Our Water? Assessing the Risk of Pathogenic Bacteria in Tampa Bay Waterways

Jeannette Bacchia, Caitlin Katz, Lauren Logsdon

While bacteria are part of all ecosystems, the presence of pathogenic bacteria such as *Staphylococcus*, and *Vibrio* species pose a risk to human health. Recreational waterways are monitored for fecal indicator organisms, but the presence of other pathogens may go undetected. Between 2019 and 2021 a University of Tampa research team sampled different recreational waters across Tampa Bay to test for the presence of Methicillin resistant *S. aureus* (MRSA) using microbial and genetic tests. Of the samples that displayed common microbial

markers for *S. aureus*, many lacked the *S. aureus* genetic marker *NucA*, indicating the presence of other unidentified potentially pathogenic organisms. 16s rRNA sequencing was used to identify these organisms to determine the presence of additional pathogens. Although most identified bacteria were non-pathogenic, we did identify two genera that could be a risk to human health. The opportunistic pathogens *Vibrio parahaemolyticus* and non-aureus staphylococci were independently isolated on multiple sampling days from multiple locations in the Tampa Bay area. Interestingly, these organisms also carried the *MecA* gene which provides methicillin resistance. The presence of these organisms poses a risk for immunocompromised individuals, and the presence of methicillin resistance may serve as a source of antibiotic resistance in the environment.

48. Materials Effect on Pathogenetic Fungal Biofilm Development

Tanner Bomstad, Louis J. Ambrosio

Hospital-acquired infections are common and cost the United States over twenty-eight billion dollars according to the CDC. These diseases can be transmitted through biofilms breaking off from medical devices (e.g., catheters) and disperse pathogens into the bloodstream. *Candida albicans* a top five leading causes of hospital-acquired infections. This research aims to explore if there is increased biofilm formation, and potential for morphological changes by *Candida albicans* on silicone (a common material for healthcare devices), as has been seen in pathogenetic bacterial biofilms. Biofilms were grown on glass and silicone in static incubation. Biofilms were prepared and imaged using scanning electron microscopy to gather data on the *Candida albicans* produced to compare. The glass was host to many small biofilms. Silicone biofilms were inconsistent in shape and size but showed potential for larger biofilms. Larger biofilms present a greater risk of spreading disease as there is an increased chance for portions to break away from the main biofilm and spread. While this study is far from definitive, it justifies further examination into the greater attachment potential of biofilms produced by fungal *Candida* species found in hospitals to better understand the pathogenic threat posed by fungal biofilms.

49. Inducing Lambda Prophage by Ultraviolet Irradiation

Lily Schools, Haydn Rubelmann, Eric Freundt

Escherichia coli W3104 is a strain that contains a temperate lysogenic phage, Lambda, in its genome. This prophage can be induced, triggering the lytic cycle upon DNA damage, resulting in phage production and cell lysis. The number of virions present after lysis can be detected through a plaque assay, where a virulent phage is combined with a susceptible host bacterium. The purpose of this study was to develop an experimental procedure for a classroom setting. Four trials were performed by irradiating a plate of *E. coli* W3104 at 302nm to induce the lytic cycle. The plates were incubated to allow cell lysis to occur. Phage was collected from the plate and isolated by centrifugation. Serial dilutions of the phage were performed and used to infect the *E. coli* strain C600. Plaque forming units were calculated for each dilution by conducting a plaque assay. All trials showed plaque formation with no significant difference in PFU/mL. After optimizing the conditions for reproducibility, the experiment was performed by students. 80%

of students formed countable plaques. This study demonstrated reproducible methodology that provides students the opportunity to induce prophage and demonstrate both the lytic and lysogenic cycles of viral replication.

50. The symbiotic relationship between *Styela plicata* and *Tunicotheres moseri*

Emma Robbins, Louis J. Ambrosio

Symbiosis is prevalent in every environment and the impact symbionts have on host organisms define relationships as either parasitic (-) or mutualistic (+). While associations that result in no positive or negative impacts on hosts are considered to be commensal, this designation is often unjustifiably assigned when little information about a symbiotic association exists. The endosymbiotic crab *Tunicotheres moseri* is reported to be commensal but there are no clear studies substantiating the lack of impact this crab has on its ascidian host. *Tunicotheres moseri*, inhabits the branchial basket of ascidians, where delicate gill tissue is housed. In this study, gill tissue from infected and uninfected host ascidians, *Styela plicata*, were compared using scanning electron microscopy to determine whether crabs cause mechanical damage to soft tissue of the branchial basket. Comparison between infected and uninfected organisms revealed damage of tissue from infected *S. plicata* but not from uninfected host ascidians. These results suggest, *T. moseri* may be parasitic instead of commensal. Further investigation is needed to better document the impact to ensure that damage observed in this study is caused by *T. moseri* and not other endosymbionts that commonly inhabit *S. plicata*.

51. Prevalence of the parasitic bacteria *Wolbachia* in the semi-terrestrial isopods *Ligia exotica* and *Ligia baudiniana* populations from Tampa Bay and Sarasota areas

Annabelle Bork, Katrina Weiss

Ligia is a semi-terrestrial isopod genus that inhabits the intertidal, wrack, and harbor zones of warm temperate and mild tropical areas. These scavenging, herbivorous, semi-terrestrial, crustaceans have been reported in the United States since the late 1900s. *Ligia exotica*, an introduced species of Asian origin, has been documented in the Tampa Bay region since 1884; however, *Ligia baudiniana*, a species native to the Caribbean region, was only confirmed to be present in the Gulf Coast of Florida within the last 10 years. These species exhibit morphological, molecular, and possibly microbiotic differences. *Wolbachia* is a parasitic bacterium found in most insects surveyed as well as crustaceans and nematodes. Species of *Wolbachia* may manipulate sexual reproduction of the host, including by feminizing processes on males, death of males in the larval stage, and the inability of an infected male to reproduce with uninfected females. Thus, it has been suggested that infection with *Wolbachia* may affect the evolution of their hosts. Although *Wolbachia* has been shown to infect *Ligia* isopods, the prevalence of this bacteria in natural populations is not well understood. In this study, we surveyed three populations of *L. exotica* from Tampa Bay and three populations of *L. baudiniana* from Sarasota in the Fall of 2022 and Spring of 2023. Assays were carried out using loop-mediated isothermal amplification (LAMP) to determine the prevalence of *Wolbachia*

infection in each populations. To date, we have detected Wolbachia only in *L. baudiniana* from Sarasota with Wolbachia positive individuals being primarily female.

52. Assessing Interspecies Interactions in Tampa Bay Using Baited Remote Underwater Video

Georgia Ambrose, William Love, Laytr McQuarters, Heather Mason

Understanding interactions between individuals of different species (interspecies interactions) are critical to assessing the food web and overall community structure. Tampa Bay is full of a diverse group of mobile organisms through which many interspecies interactions occur including predator-prey, competition, and symbiotic interactions. Baited Remote Underwater Video (BRUV) units are a non-invasive method for characterizing underwater environments and were used to study Tampa Bay shallow water habitats across a year with monthly sampling and a total of over 200 deployments. With the developments of the BRUV units in Tampa Bay we assessed water chemistry (including turbidity) as well as geographic influences such as proximity to seagrass beds and distance between deployments. Assessing the habitats of where the interspecies interactions are occurring in Tampa Bay is important for the understanding of habitat conservation, especially in seagrass beds.

53. Facultative Macrochelid Microbiome

Kelsey Logan, Emily Durkin

Not only do microbes impact the health of animals, but they also can shape behavior. This observation has been recorded across multiple taxa acting to influence behaviors ranging from feeding to social communications. Arthropod microbiomes often include vertically transmitted bacteria known to alter behavior. The following research used macrochelid mites which are facultative parasites that exhibit variations in parasitic behavior. The microbiome of these macrochelids has yet to be examined. The objective of the following study is to explore the microbiome of facultatively parasitic macrochelids to determine if there are microbe differences between free-living and parasitic mites. This will be explored by obtaining and culturing mite populations, isolating individuals that exhibit free-living and parasitic behavior, extracting DNA, and then sequencing the DNA to identify bacteria in the microbiomes. Isolating individuals by behavior is a highly intensive process and the majority of the population data is processed. The preliminary comparisons of the population data show differences in free-living and parasitic tendencies.

54. Evaluating Changes in Photoinhibition with Leaf Age and Irradiance in *Rhizophora mangle*

John Dorrian, Kevin S. Beach

Mangrove forests are an essential ecosystem providing many benefits that include, supporting biodiversity and fisheries, commercial products, and climate mitigation. Restoration guidelines for mangroves have not been updated in 22 years new information being available, and in an attempt to update guidelines, the available information regarding irradiance and the local red mangrove, *Rhizophora mangle*, was found to be incomplete and, at times, contradictory. The present study seeks to identify if elevated irradiance levels induce photoinhibition in *R. mangle*

and how this may impact restoration efforts. After exposing 50 seedlings to two light treatments and collecting field samples, it was found that pigmentation varied significantly with leaf age, NPQ induction was significantly higher in plants from the low light treatment, and the slopes of NPQ vs PAR graphs decreased gradually with each week. These data speak to the risk of shifting plants from one light regime to another, as low light individuals induced NPQ quicker when exposed to the same light levels as high light plants, but also the possibility to successfully aid them in that transition, by implementing an adjustment period prior to planting, and with the existing guidelines could be used to increase the effectiveness of restoration projects.

55. Larval development of appendages in *Tunicotheres moseri*

Sarah Kelley, Louis J. Ambrosio

Tunicotheres moseri is a marine crab that completes its entire larval development on the abdomen of the mother. During this time, embryos develop asynchronously, leaving defenseless eggs paired with highly developed juveniles. Pairings of siblings with asymmetries in development result in sibling cannibalism, with only poorly developed early stages (eggs and zoea I) being cannibalized by more developed sibling juveniles. If early-stage siblings are more vulnerable due to poor appendage development and the inability to defend themselves, it was expected that eggs and zoea I would have less developed appendages when compared to their more developed siblings (zoea II, megalops, and juveniles). Using scanning electron microscopy, the appendage development of the larval stages was imaged and compared. These micrographs indicated that there was little difference between the appendage development of the zoeal stages that would allow for greater defensive capabilities. There was a much larger jump in appendage development in megalops and juveniles, presenting with well-defined appendages that would be effective in defense. These findings partially support the hypothesis that early stages may be vulnerable to cannibalism due to poor defensive capabilities, but it does not explain why zoea II are not cannibalized, given its similar development to zoea I.

56. Testosterone effect on *Plasmodium* sp. intensity in *A. sagrei*

Isabella DeLuca, Briar Marini, Lexi Davis, Jusmary Mercado, Emily Durkin

The objective of this study was to measure the intensity of *Plasmodium* sp. in both male and female *Anolis sagrei* (brown anoles). Previous research shows a positive correlation between testosterone and immunity suppression. Because of this, we would predict to see a higher prevalence and intensity of *P. sp.* in male *A. sagrei*. Seasonality must be taken into consideration because prior knowledge indicates that *P. sp.* is in higher prevalence in the winter months than the spring months which is the period of this study. The sample size consisted of both male and female sexed *A. sagrei*, as we wanted to compare parasite intensity. The design of this study involved capturing brown anoles around Gainesville, Tampa, and Fort Myers, Florida, and extracting their blood. We then produced blood smears and observed them under a compound microscope. We recorded the quantity of parasites present in each smear using six different fields of view. With this data collected, we calculated the intensity of *P. sp.* and compared these values amongst sexes in *A. sagrei*. We found that *P. sp.* intensity was higher in

males which supports our hypothesis that testosterone does have an effect on immunity suppression in *A. sagrei*.

57. Discovering unique and new types of low surface brightness galaxies

Campbell Bonner, Michael G. Jones, Burcin Mutlu-Pakdil, Denija Crnojevic

Most galaxies in the Universe fall under two categories, spirals or ellipticals, based on their morphology; they range from being very large and luminous to very small and faint. Recently, researchers have discovered low surface brightness galaxies that look very faint and show different properties than most common galaxies. This study expands on two ongoing research projects that are pursuing the search of such rare and extreme galaxies. Project 1 focuses on finding diffuse galaxies and blue blobs within a survey the Fornax cluster of galaxies. Project 2 focuses on elusive, very low surface brightness galaxies that are extremely diffuse; these galaxies are being searched for in the Legacy Surveys DR10 images, around hosts similar to our Milky Way galaxy. Both studies are utilizing a systematic method of visual searching. Using this methodic approach, we have identified several candidates that match these recently discovered rare galaxy types.

58. Deriving Neural Stem Cells from the Umbilical Cord as a Potential Treatment for Neurodegenerative diseases

Kayla Santopietro, Michael Cottone, Pavan Rajanahalli

Neurodegenerative diseases such as Alzheimer's disease (AD), Parkinson's disease (PD), multiple sclerosis (MS), and bipolar disorders currently have limited treatment with the drugs available to date. Human mesenchymal stem cells isolated from the umbilical cord (hUMSCs) are being investigated as a suitable option for future clinical trials due to their non-invasive isolation procedure, immunomodulatory effects, and self-renewing properties. Extracellular chemical signals secreted from differentiated hUMSCs can be utilized to derive specialized cells rather than using traditional growth factors. This study explores the properties of hUMSC derived NSCs grown on different conditions such as, plastic, vitronectin (VXF), and poly-L-ornithine (PLO) with FGF2 beads or FGF2 powder. The cellular growth, morphology, and abundance of NSCs were evaluated over a period of six days. PLO conditions supplemented with FGF2 powder provided the greatest abundance of NSCs and selected for the best quality of exosomes.

59. Parasite Prevalence in *Archosargus probatocephalus* (Sheepshead sp.) and *Morone saxatilis* (Striped bass sp.)

Kayla Santopietro, Michael Cottone, Alexandria Stouch, Emily Lubas, Emily Durkin

The prevalence of parasite infections among fish populations is a growing concern, as it poses a threat to the world's largest sustainable source of high quality protein. Studies in underdeveloped countries have reported that there was a greater abundance of parasites in wild caught fish as compared to more developed countries. This highlights the demand for more effective measures to protect the sustainability of the global seafood industry. This study

detected, identified, and determined the prevalence of parasites in *Archosargus probatocephalus* (Sheepshead) and *Morone saxatilis* (Striped bass). Both species of fish were obtained from a wild-caught fish market in Tampa Bay. Fish necroscopies were performed on 10 fish for each species. Out of 20 fish samples examined, 5 fish were infected with 7 parasites in total. The mean parasite abundance for both species was 0.35 and the highest abundance was for the *Archosargus probatocephalus*. Parasites were found in the gills, intestines, and fins of infected fish.

60. Hubble Space Telescope Observations of NGC 253 Dwarf Satellites

Livia Bezerra Costa, Denija Crnojevic

Dwarf galaxies are the faintest and smallest galaxies in the universe. Our currently accepted model for the formation of our Universe, the Lambda Cold Dark Matter Model, is challenged by observations of these small and faint galaxies: it does a good job explaining hierarchical structure formation for large scales but lacks explanations for small sub-galactic scales. The study of dwarf galaxies can thus help us constrain models of galaxy formation and evolution. We have surveyed NGC253, a Milky Way-mass spiral galaxy in a nearby isolated environment, using a ground-based 6.5m telescope, which has resulted in the discovery of nine faint dwarfs around this galaxy. These appear to be in a planar configuration, which is unexpected in theoretical models. We have further obtained deep Hubble Space Telescope images to confirm their nature and their spatial distribution, and we will use these images from HST to find distances, luminosities, metallicities, and star formation histories.

61. Analysis and manipulation of various fluorescent proteins as a guided-inquiry classroom laboratory project

M. Elise Gething, Anna McCormick, D. Scott Witherow, and L. Michael Carastro

The study of fluorescent proteins has revolutionized how protein expression is studied within cells. The successful subcloning, transformation, expression, and purification of fluorescent proteins require multiple laboratory and data analysis skills. The purpose of the experiments described is to determine the ideal procedure to successfully subclone and express four different fluorescent proteins to be used in the Advanced Biochemistry course at the University of Tampa including EGFP, mKalama, mVenus, and mT-Sapphire. The successful PCR amplification utilizing the same parameters of each of these variants was confirmed through the expected band size. The successful double restriction digestion subcloning of the variant into pET-41a using NcoI and NotI restriction digestion was performed. This subcloning and transformation into competent *E. coli* were confirmed through Sanger sequencing. The IPTG induction of expression of the fusion proteins revealed fluorescence of EGFP, mKalama, mVenus, and mT-Sapphire under broad range UV light. The purification of these proteins was completed using glutathione affinity chromatography. A western blot analysis was performed using anti-GFP mouse IgG monoclonal antibody that revealed that the antibody binding site is conserved across variants. The results of these experiments indicate the successful subcloning and expression in competent *E. coli* cells of mVenus, mT-Sapphire, and mKalama.

62. Carbazole Derivatives as Photocatalysts in the C-H Arylation of N-Methylpyrrole

Natalie A. Reece, Ashley Longstreet

Photocatalysts with the ability to transform substrates that are difficult to reduce or oxidize are valuable, as these redox reactions have posed continuous challenges. In an ongoing effort to apply the unique redox properties of carbazole derivatives, our group has investigated reactions involving the utility of carbazole derivatives as powerful single-electron photoreductants. After demonstrating the ability of eight carbazole derivatives to reduce electron deficient aryl bromides and chlorides in the hydrohalogenation reaction, three of the carbazoles were applied towards the C—H arylation of pyrrole derivatives to further investigate their reactivities. Thus far, three carbazoles were used successfully in the arylation of N-methylpyrrole with 2-chlorobenzonitrile to produce the desired product in 57—79% isolated yields. Unlike when other photoreductants are employed, no additives to facilitate the reduction of the oxidized carbazole were necessary. The modularity and favorable oxidation potential of the carbazole provides a framework for future experiments, which can facilitate analysis of the reaction mechanism and aid in the development of novel transformations.

63. Ectoparasites within the Tampa Bay

Kathleen Gillis, Alyssa Murphy, Rebecca Huizer, Sean Quinn, Emily Durkin

This study examined the presence of *Amyloodinium ocellatum* and other ectoparasites, the water quality, and the location of the specimens to see if any connections arise that are distinguishable or significant. There are two different locations that the Florida Fish and Wildlife gathered the specimens from on two different days. Sample one was taken on day three of their collection and is farther north than sample two which was taken on day four and is more south, closer to the Caribbean. We examined the fins of each fish for visible parasites but did not go in depth under a microscope. We also took a gill sample and scale scraping from the same side of the fish, alternating sides with every other fish. Upon analyzing our data, the most significant connection found was between dissolved oxygen levels/conductivity and parasitic presence arose. These findings correlate with our predictions, that dissolved oxygen/conductivity and parasitic presence are inversely related. This is due to the lower levels of immunity displayed from fish during unfavorable conditions. The needs of the fish are not being met, thus making them more susceptible to parasites as their immune system cannot fight the parasite to its full extent.

64. Morphological Investigation of *Alloniscus oahuensis*

Johnny Kenney, Louis J. Ambrosio

Molecular analyses have uncovered cryptic diversity within many taxa in the sub-order Oniscidea and have demonstrated that coastal species, species from remote islands, and species with complex taxonomic histories exhibit high levels of cryptic diversity. *Alloniscus oahuensis* fits each category. Additionally, previous genetic analysis of *Alloniscus oahuensis* suggests cryptic species present within the taxon. Two divergent lineages were uncovered, Philippines-Micronesia and Polynesian-Melanesia. In this current study, specimens of the

Polynesian-Melanesia clade and specimens of the Philippines-Micronesia clade were examined to establish a morphological basis for comparison. Specifically, this study utilized Scanning Electron Microscopy (SEM) to compare key physical features between the species, notably the telson and pereon edges, and conduct dimensional analysis of the cephalothorax to body size ratios between the cryptic species for contributions in future taxonomic explorations.

65. Observation of Cellularization in fs(1)A1459 Mutants

Charli Wingfield, Stephen Kucera, Leif Benner, Louis J. Ambrosio

Drosophila melanogaster is a common and effective model organism in genetics research and development. They are quick to reproduce, have complex genomes, and are genetically very similar to humans with less redundancy. The mutation fs(1)A1459 found in *D. melanogaster* is one of the recessive maternal effect mutations that cause eggs to be laid but arrest development before maturation. This halt in embryonic development has been narrowed down to occurring in the cellularization phase after the formation of the syncytial blastoderm when nuclei elongate, and cell membranes are supposed to form. The peripheral nuclei of a homozygous and heterozygous embryo were quantified and compared to get the average number of cell structures in an area of space. Using the average number of cell structures a t-test was conducted and rejected the null hypothesis making the difference in the average number of cell structures between genotypes significant supporting the irregularity of cell membrane formation of embryos from flies homozygous for fs(1)A1459.

66. The use of sea urchin immune cells as indicators of environmental stress

Lydia Francis, Michelle Roux-Osovitz

Echinoderms are spiny skinned animals including the charismatic sea urchin, iconic sea star, sand dollars, and the sea cucumber. Sea urchins play an important role for developmental biology research, genome breakthroughs, invertebrate immunity discoveries and international cuisine! Sea urchins' immune systems can provide us knowledge for detection and quantification of the effects of stressors on sea urchins in Tampa Bay and in aquaculture. Sea urchin immune cells (coelomocytes) can be found in the coelomic fluid within the coelomic cavity of the animal. There are four essential types of coelomocytes, the red amoebocyte, the white amoebocyte, vibratile cells, and phagocytes. The immune cells are involved in defense functions including phagocytosis (engulfing and destroying foreign particles), encapsulation of pathogens (disease causing microbes), production of antimicrobial compounds (to fight infection), clot formation (for wound healing) and removal of synthetic substances and chemicals (i.e. microplastics). The practice of isolating, identifying, and measuring changes in urchin *Lytechinus variegatus* coelomocytes is important for studies involving non-memory based or innate immune response during environmental stressors such as harmful algal blooms (red tide), microbial infections (balding disease) and seasonal sea grass habitat loss. In this research study we have isolated, identified and are quantifying coelomocytes under field and laboratory conditions. Our quantification of cells in a controlled laboratory urchin population versus a wild urchin population, will help us understand how changes in coelomocyte abundance, diversity, and function fluctuate in response to environmental stressors.

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