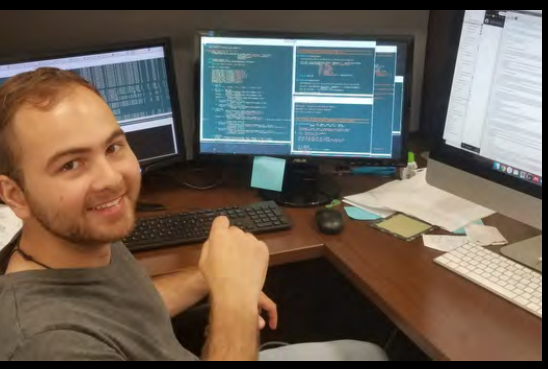
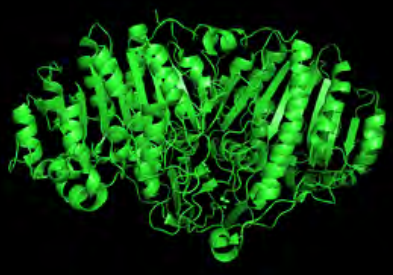
CNHS UNDERGRADUATE research SYMPOSIUM





FRIDAY, APRIL 26TH FROM 2-5 P.M. VAUGHN 9TH FLOOR

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 astrisk), 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 iaccording 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 and Biochemistry, the Department of 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

ALBERT MANERO, PH.D.
EXECUTIVE DIRECTOR
LIMBITLESS SOLUTIONS

APPLYING INTERDISCIPLINARY RESEARCH TO SOLVE BIG CHALLENGES

ABSTRACTS

1. A population analysis of physical activity levels among disabled and Native American individuals living in the United States

Marissa Rappa, Willie Leung

Introduction: Physical activity has many different health-related benefits. People across different population are encouraged to engage in physical activity throughout their life. However, currently, there is a gap in literature examining the physical activity levels of Native American with and without disabilities. The purpose of this study is to examine the association between physical activity levels and disability status and Naïve American status.

Methods: The current cross-sectional secondary data analysis included 205362 participants from the 2015 – 2019 Behavioral Risk Factor Surveillance System. Participants were classified into four different groups based on their self-reported disability status and Native American Status. Physical activities were examined as physical activity per week (minutes) and vigorous physical activity per week (minutes) based on their participants self-reported two most engaged leisure physical activity's types, frequency, duration, and intensity. Descriptive analysis and linear regression with interaction terms between disability status and Native American status were performed under survey analysis to examine the variables of interests.

Results: Among participants without disabilities, 99.20% (95% CI [99.12, 99.28]) were non-Native American and 0.80% (95% CI [0.72, 0.88]) were Native American. Among people with disabilities, 98.38% (95% CI [98.19, 98.58]) were non-Native American while 1.62% (95% CI [1.42, 1.81]) were Native American. The linear regression suggested that having disabilities and being Native American are associated with higher levels of physical activity per week ($p < .001$). Similar results were found in the linear regression in the vigorous physical activity per week, where people with disabilities were associated with higher vigorous physical activity per week ($p < .001$). The interaction term in both regression was not statically significant ($p > .05$).

Discussion: Disability statues and Native American status might not influence each other in regard to physical activity levels. However, looking at the results separately, disability status and Native American status do impact physical activity levels. Cultural experiences and educational experiences of Native American, regardless of disability status, have the potential to influence physical activity.

2. Does vaping impact physical activity levels among college-age individuals?: A population-based study using the 2017 BRFSS

Maria Fernanda Morones Gomez, Adam King, Thais Luchesi de Medeiros, Willie Leung

Introduction: Participating in physical activity provides several health benefits, including increased life expectancy, improved brain health, and stronger bones and muscles. Vaping has gained popularity, however, limited research has been conducted on the relationship between college-age vapers and their physical activity using free-living dataset.

Purpose: To examine the association between vaping status and physical activity levels among college-aged individuals.

Methods: The current secondary data analysis used self-reported data from college-aged individuals, ages 18 to 24, from the 2017 Behavioral Risk Factor Surveillance System. Participants were classified as vapers if they self-reported current use of electronic cigarettes or vaping, otherwise, they were classified as non-vapers. Participants' physical activity was categorized by physical activity per week (minutes) and vigorous physical activity per week (minutes). Descriptive and linear regressions were used to examine the association between variables using survey analysis.

Results: There were 6,802 participants in this study. There were 657 (8.95%) individuals who were vapers and 6,145 (91.05%) non-vapers. Vapers averaged 389.76 (95% CI [325.91, 453.61]) minutes of physical activity minutes each week. The average number of vigorous physical activity minutes per week for vapers was 20.02 (95% CI [2.08, 37.96]) minutes. T-test results showed no statistically significant difference between vapers and non-vapers in both physical activity variables ($p>.05$). Under the linear regression models, both adjusted and unadjusted regressions found no statistically significant associations between vaping status and physical activity levels among college-aged individuals ($p>.05$).

Discussion: These findings might be explained by the fact that the study's participants were college students, who are known to exercise regularly, suggesting vaping has a minimal effect on physical activity levels. In general, vaping may not have the significant impact on physical activity levels that we believe it does.

3. The Impact of Smoking and Vaping on Weight Training Frequency Among College Age Individuals

Adam King, Maria Fernanda Morones Gomez, Thais Luchesi, Willie Leung

Introduction: The exploration of how vaping and smoking affect weight training is fundamental for comprehending the potential ramifications, both adverse and beneficial, of these behaviors on an individual's engagement in weight training activities. Currently, there is limited research on the examination of weight training activities among smokers and vapers.

Purpose: To examine the association between smoking and vaping status and frequency of weight training among college-aged individuals.

Methods: Participants between the ages of 18 and 24 years in the 2017 Behavioral Risk Factor Surveillance data were included in the analysis. Smoking status and vaping status were based on participants' self-reports of current product use. Participants were classified as smokers if they reported current smoking, and participants were classified as vapers if they reported current vaping. Participants were classified separately for smoking and vaping status. Frequency of strength training served as the dependent variable for the current study, which was based on participants' self-reported frequency of strength training per week (counts). Descriptive analysis and linear regression were used to examine the association between variables among college-aged individuals.

Results : The total number of participants that took part in the research study was 6,802 college-aged individuals, of the sample size only 630 participants reported currently smoked and 657 participants reported currently vaped at the time of survey. Across the sample, the average frequency of weight training was 2.36 (95% CI [2.26, 2.46]) times per week. When stratified by smoking status and vaping status, the average frequency of weight training was 2.55 (95% CI [1.95, 2.79]) times and 2.75 (95% CI [2.20, 2.84]) times per week, respectively. Both the adjusted and unadjusted linear regression found no statistically significant associations between smoking and frequency of weight training and between vaping and frequency of weight training per week ($p>.05$).

Discussion: The determination of the effects of smoking and vaping on weight training remains inconclusive among college-aged individuals. Unlike previous studies reporting on lower physical activity levels among smokers and vapers, the associations might be different on weight training. Further analyses are needed to examine the impact of smoking and vaping on weight training and its effect on health.

4. Flex and flourish; the power of pumping iron in golden years – investigating how strength activity fuels independent living among seniors

Makensey Caroon, Willie Leung

Introduction: Many adults experience age-related limitations which may lead to an independent living disability, such as an inability to drive, difficulty shopping and doing errands alone, and visiting a doctor alone. Many activities of independent living require the use of muscular strength. Currently, there is limited literature examining the influence of strength activity on independent living disability among older adults.

Purpose: To examine the association between independent living disability status and engagement in strength activity among older adults.

Methods: Three cycle years (2015, 2017, 2019) of data from the Behavioral Risk Surveillance System were utilized in the current analysis. Independent living disability status were classified based on participants self-reported of their ability to do errands alone such as visiting a doctor's office or shopping. For the dependent variable of strength activity engagement, it was based on participants self-reported frequency of strength activity per week. If participants have a non-zero responded they were considered engaging in strength activity. Otherwise, they were considered not engaging in strength activity. Unadjusted and adjusted logistic regression with survey analysis were performed to examine the association between the variables of interests, where strength activity engagement was regressed into independent living disability status. Demographic characteristics served as covariates in the adjusted logistic regression analysis.

Results: A total of 320606 participants were included in the analysis, with 9.095 (95% CI [11.03, 11.53]) reported having independent living disability. Across the sample, 35.115 (95% CI [34.76, 35.47]) reported engaging in strength activity. c2 analysis found that there was association between independent living disability and strength activity engagement ($F = 104.61$, $p<.01$). The unadjusted regression suggested that people engaged in strength activity were less likely to experience independent living disability (OR=0.72, 95% CI [0.68, 0.777]).

Discussion: There is a benefit to doing strength activities. Therefore, it is recommended that older adults participate in strength activities with the goal of meeting strength activity guidelines. Strength activities should be tailored to the individual needs of the older adults.

5. Zooming in on the Hyperactive Highway: Investigating the Link Between ADHD Severity and Adherence to Physical Activity Guidelines

Ryleigh Wenker, Willie Leung

Introduction: The focus on ADHD is often from a mental and emotional standpoint, as it effects children's ability to focus and complete tasks. Physical activity promotes dopamine levels and is scientifically proven to calm the symptoms of ADHD. Physical activity can be used as a way to cope with ADHD, which is why it is so important to look at whether or not these children with ADHD are meeting physical activity guidelines across different severity of ADHD. There is limited literature examining how severity of ADHD impacts physical activity levels among children.

Purpose: To examine the association between meeting physical activity guidelines and ADHD severity levels among children.

Methods: A total of 144318 of children from the 2019 – 2022 National Survey of Children Health were included in the analysis. Participants were classified as meeting and not meeting the physical activity guidelines of engaging in at least 60 minutes of moderate intensity everyday based on participants' self-reported. Descriptive analyses were performed to summarize the variables. Chi square analysis (□2) were performed to examine the association between meeting physical activity guidelines and ADHD severity levels among children under survey analysis.

Results: Among the participants, 88.25% (95% CI [87.01, 89.42]) of participants were not diagnosed with ADHD, 5.11% (95% CI [4.58, 5.67]) with mild ADHD, 5.14% (95% CI [4.59, 5.72]) with moderate ADHD, and 1.50% (95% CI [1.30, 1.72]) with severe ADHD. Among the sample, 18.83% (95% CI [17.96, 19.71]) meet the physical activity guidelines. When stratified by ADHD severity levels, 19.00% (95% CI [18.08, 19.91]), 16.92% (95% CI [15.38, 18.45]), 16.83% (95% CI [15.61, 18.04]), and 22.06% (95% CI [18.60, 25.52]) of children without ADHD, mild ADHD, moderate ADHD, and severe ADHD met the physical activity guidelines. There were statistically significant association between physical activity guidelines and ADHD severity levels based on the □2 analysis (F2.7, 405 = 6.20, p <.001).

Discussion: There is an association between meeting physical activity guidelines and ADHD severity levels, which could be due to the symptoms of ADHD. There should be an emphasis on the importance of physical activity guidelines among children with ADHD because of the benefits of physical activity associated with physical and mental well-being.

6. Dancing to the Beat of Your Heart: Meta-Analysis on the Effect of Dancing Exergames on Heart Rate

Christian Farrell, Gianna Fiore, Ashley Hirsch, Melissa Rumberly, Willie Leung

Introduction: Dancing exergames, which blend physical activity with video games, offer an immersive exercise experience with music. While prior research has explored their potential in promoting heart rate (HR) elevation, a comprehensive analysis of HR patterns during gameplay remains scarce. This study seeks to consolidate existing literature on HR elevation in dance exergames using meta-analysis techniques.

Methods: A systematic search across four databases (PubMed, SPORTDiscus, Academic Search Ultimate, and CINAHL) yielded 1734 articles. After review of title, abstracts, and full text of articles by researchers, it was determined that 10 articles met the inclusion criteria of comparing HR before and after engaging in physical activity intervention involving dancing exergames, such as Dance Dance Revolution and Just Dance. Studies were excluded if the study only measured physical activity levels and energy expenditure during dancing exergames.

Results: Among the ten studies included, 227 participants were included in the meta-analysis with ranges from 7 to 46 participants. Six studies examined HR before and after dancing exergames of children and four examined adults. The included dancing exergames included Dance Dance Revolution, Just Dance, Just Dance 3, and Dance Central. Additionally, the length of the physical activity intervention with dancing exergames ranged from one week to 12 weeks with duration lasting from 15 minutes to 45 minutes. Utilizing the random-effect model, it was found that there was a small but statistically significant increase in HR after experiencing dance exergames (standard different in means = 0.44, 95% CI [0.12, 0.76], $p < .01$, $Q = 37.32$, $I2 = 75.89$, $k = 10$; Hedges's $g = 0.42$, 95% CI [0.11, 0.73], $p < .01$, $Q = 37.77$, $I2 = 76.17$).

Discussion: These findings reinforce prior conclusions, underscoring the efficacy of dance exergames in promoting HR elevation and encouraging individuals of all ages to incorporate them into their physical activity routines, given the inherent enjoyment associated with their gameplay.

7. Stomach Content Analysis of the Non-Native Mayan Cichlid

Adam D. Cieslik, Mark G. McRae

The Mayan Cichlid (Mayaheros uropthalmus) is a tropical fish native to Central America and southern Mexico. This aggressive cichlid, first recorded in 1983 in the Everglades, also has established and expanding populations in the Tampa Bay watershed. As in their native and introduced ranges, Mayan Cichlids in a local nature preserve near east Tampa Bay were documented to be generalist omnivores with a variety of prey items found in their stomachs. Additionally, some previous studies documented an increased presence of fishes in the stomachs of larger Mayan Cichlids; cichlids collected from Wolf Branch, however, showed no such relationship. There was no correlation between fish length and the proportion of vertebrate prey (e.g., fish) to invertebrate prey (e.g., insects) found in the stomachs of Mayan Cichlids collected at this site. The abundance of invertebrates in the stomachs of juvenile and adult Mayan Cichlids suggests potential competitive impacts on native species that also prey on invertebrate food sources. This omnivory, in combination with their hardiness and aggressiveness, may be facilitating the expansion of this species in and around Tampa Bay. Future work, therefore, will explore possible dietary overlap between Mayan Cichlids and native Centrarchids in habitats where their populations coincide.

8. Understanding Weight Training Patterns: A Demographic Study of Adults with Disabilities

Ashley Hirsch, Gianna Fiore, Christian Farrell, Willie Leung

Introduction: There are multiple positive health-related benefits associated with weight training engagement. Demographic factors, encompassing age, sex, ethnicity, and education levels, have been linked to weight training engagement in individuals without disabilities. Women and people with below high school education tend to engage in less weight training activity. Currently, there is limited literature examining the demographic characteristics regarding weight training participation among people with disabilities. The current analysis aims to examine the association between demographic variables (age, sex, race, weight status) and weight training participation among people with disabilities.

Methods: The current cross-sectional secondary data analysis utilizes data from the 2015-2018 Behavioral Risk Factor Surveillance System. People were identified as having a disability based on the Washington Group on Disability Statistic Questions Set. Participants without a disability were removed from the analysis. Demographic variables such as age (>65 vs <65), sex (male vs female), race (people of color vs white), and weight

status (underweight, overweight, obese vs normal weight) serve as independent variables. Self-reporting of strength engagement serves as the dependent variable. Descriptive and regression analysis was performed separately for each demographic variable.

Results:The findings revealed that only 30.68% (95% CI [30.29, 31.08]) of participants reported engaging in weight training. Significantly, a higher proportion of individuals aged ≥65 years, males, Caucasians, and those with a college education reported engaging in weight training ($p<.05$). Logistic regressions further illuminated the influence of demographic factors on strength activity engagement, whereas older adults (OR=1.57, 95% CI [1.51, 1.63]), males (OR=1.35, 95% CI [1.30, 1.40]), and those with a college education (OR=1.73, 95% CI [1.67, 1.80]) were more likely to participate in weight training in comparing to their counterparts. Additionally, white participants with disabilities were 0.98 (95% CI [0.86, 0.93]) times the odds of people of color engaging in weight training.

Discussion: Overall, only a small percentage of participants with disabilities reported engaging in weight training. Individuals with disabilities potentially face barriers in participating in weight training. Common barriers included a lack of facilities, a lack of trained professionals with knowledge in working with people with disabilities, and a lack of adaptive equipment that might limit their participation in weight training. In addition to these barriers, demographic factors might influence their participation in weight training as suggested by the results of the current study. Characteristics of people with disabilities should be considered when developing tailored interventions for weight training participation.

9. Exploring the Interplay of Smoking Behavior and Physical Activity in College-Aged Individuals: A Comprehensive Review

Thais Luchesi De Medeiros, Maria Fernanda Morones Gomez, Adam King, Willie Leung

Introduction: Despite the prevalence of college smokers, there is still a scarcity in literature dedicated to this demographic group, especially in its relationship to physical activity. Furthermore, with declining smoking rates among college students, updated research on the remaining smokers is lacking, considering the health-related benefits associated with physical activity engagement.

Purpose: To examine the association between smoking status and physical activity levels among college aged individuals.

Methods: The 2017 Behavioral Risk Factor Surveillance data were used for the current cross-sectional secondary data analysis. For the current study, only college-aged participants between the ages of 18 and 24 years were included. Smoking status was determined based on participants' self-reported smoking status. If participants reported current cigarette smoking, they were classified as smokers; otherwise, they were classified as noncurrent smokers. Participants' physical activity levels were calculated from the BRFSS in physical activity/week (minutes) and vigorous physical activity/week (minutes). Descriptive and linear regressions were used for analysis.

Results: Of the 6802 participants included in the study, 630 (8.81%) self-reported smoking, while 6172 (91.19%) did not. The average physical activity/week was 399.75 (95% CI [288.24, 523.82]) minutes for smokers and 340.44 (95% CI [321.68, 353.14]) minutes per week. The average vigorous physical activity/week was 23.79 (95% CI [4.91, 42.68]) minutes and 21.14 (95% CI [15.46, 26.82]) minutes for smokers and non-smokers, respectively. Both adjusted and unadjusted linear regressions found no statistically significant associations between smoking status and physical activity-related variables (physical activity/week and vigorous physical activity/week) ($p>.05$).

Discussion: The study's findings were inconclusive regarding the association between smoking habits and weekly physical activity minutes among college students. This could be due to the high amount of colligate athletes who partake in smoking as a stress reliever in addition to their already increased physical activity levels. Interventions targeting college campuses should raise awareness of smoking risks and their potential impact on future physical activity levels.

10. Population Study of Amphiuma means in an Urban Wetland

Alana Acevedo, Ethan Burka, Mark McRae, Jacob LaFond

Our project aims to determine the population of Amphiuma means in downtown Tampa, Florida. The population we studied is in a freshwater stream in Plant Park on the University of Tampa campus. The stream has two sources: one being the Hillsborough River and the other a freshwater spring. For this project, we wanted to determine how many individuals of A. means occupy the freshwater stream in the Plant Park, and where the population is most densely located. We set out multiple baited minnow traps in different areas throughout the stream. Water temperature and salinity were tested and recorded. We caught eight individuals, of which we had one recaptured individual. We found that the population of A. means is concentrated on the side with the lowest salinity and the most plant cover. Future directions for this project include determining possible travel between

the two sites with the most plant cover and population density to see if these are two separate populations. It is a valuable discovery that we found a large population of A. means in a disturbed urban environment which can imply that A. means is less elusive than previously thought.

11. Flex Your Freedom: How Weight Training Turns Young Adults (18-25) into Superheroes of Functionality!

Sophie Bradburn, Megan Ryan, Willie Leung

Purpose/Hypothesis: To examine the association between functional disability and weight training engagement among young adults with the hypothesis of young adults who engage in weight training are less likely to experience functional disability.

Subjects: 54927 non-institutionalized US adults between the ages of 18 – 25 years old living in the US from the 2015 – 2019 Behavioral Risk Factor Surveillance System.

Materials and Methods: Participants self-reported their engagement in weight training per week and whether they are experiencing functional disability by reporting having difficulty in dressing, bathing, or doing errands alone or not. Participants were classified as engaging in weight training if they had a non-zero response for the frequency of weight training per week. Participants were considered to experience functional disability if they reported difficulty dressing, bathing, and doing errands alone. Unadjusted and adjusted logistic regressions were performed to examine the impact of weight training on functional disability among young adults with the adjusted model adjusted for demographic variables.

Results: Among the participants, 64.84% (95% CI [64.15, 65.51]) reported engaging in weight training with the average frequency being 2.12 (95% CI [2.08, 2.15]) counts per week. Regarding functional disability, 95.59% (95% CI [95.30, 95.87]) of participants did not have a functional disability and 4.41% (95% CI [4.13, 4.70]) did. The unadjusted and adjusted logistic regression found that participants engaged in weight training were less likely to experience functional disability (OR = 0.60, 95% CI [0.53, 0.69]; aOR = 0.77, 95% CI [0.66, 0.89]) in compared to participants who did not engage in weight training.

Conclusions: Engagement in weight training is suggested to lower the risk for functional disability among young adults. Young adults should be encouraged to engage in weight training at least two times per week.

12. Puff ‘n’ Pump: Unveiling the Impact of Vaping on College Fitness!

Megan Ryan, Sophie Bradburn, Willie Leung

Introduction: Multiple studies in the past have examined the effect of vaping on physical activity behaviors but often neglect to examine the impact frequent vaping has on physical activity. Therefore, this study aims to investigate the association between the frequency of vaping physical activity and strength activity engagement among college-aged individuals.

Methods: A total of 6802 participants between the ages of 18 – 24 from the 2017 Behavioral Risk Factor Surveillance System (BRFSS) were classified into three groups based on their self-reporting frequency of vaping (e.g., never, someday, and always). Physical activity levels/week, vigorous physical activity/week, and weight training/week were based on participants self-reporting their engagement of physical activity’s frequency, duration, and intensity per week. ANOVA was performed to compare the physical activity variables between the three groups. Additionally, unadjusted and adjusted linear regression was performed to determine the association between the physical activity variables and the frequency of vape among college-aged individuals.

Results: Among the participants, 91.05% (95% CI [89.85, 92.17]) never vape, 6.35% (95% CI [5.43, 7.37]) vape someday of the week, and 2.59% (95% CI [2.00, 3.29]) always vape. The always vape group had the highest average of physical activity/week in minutes (398.61, 95% CI [281.77, 515.44]) and vigorous physical activity/week (42.59, 95% CI [-16.56, 101.73]) minutes among the three groups. However, the ANOVA results did not find statistically significant differences among the three groups ($p > .05$). For frequency of weight training, no statistically significant differences were also found among the three groups but participants who vape somedays had the highest average frequency of 2.58 (95% CI [2.20, 2.95]) per week. Among the unadjusted linear regression, the only statistically significant association was found between the vigorous physical activity/week between the never vape group and the someday vape group (= -10.69, $p = .03$). Yet, there was no association between the frequency of vaping and the included physical activity variables ($p > .05$).

Conclusion: College-aged individuals are vaping at different frequencies but there is no association with physical activity or strength activity levels. However, the current study did not examine the duration of vaping, which could impact physical activity engagement and levels among college-aged individuals. Potentially other factors, such as age, peer pressure, socioeconomic status, and VO2max could impact college-aged individuals’ physical activity as well. Therefore, further research is required to determine if the

frequency of vaping affects physical and strength activity engagement among college-aged individuals.

13. Investigating mechanisms of antioxidant treatments on drug resistant breast cancer

Kimberly Dobrinski, Sofia Cuello, Andrew Reidenbaugh, Ryan Stewart

Breast cancer is the second leading cause of death in women, it will kill approximately 1 in 40 women. Roughly 50% of HER2 cancers develop drug resistance; this study hopes to fight those statistics. Capsaicin has shown an ability to kill MCF-7 and MDA-MB-231 breast cancer cell lines, but the mechanism of cellular death that it enforces is still unknown. Three different assays were utilized to analyze the possibility of the Warburg Effect playing a role; lipid peroxidase, CyQuant, and oxygen plate analysis. The lipid peroxidase assay showed little change in oxidative stress from the DMSO control and the capsaicin treated cells. The CyQuant assay showed minimal differences in cellular death rates with varying concentrations of capsaicin. The oxygen plate analysis showed that different concentrations of capsaicin had only small changes in oxygen consumption. This data indicates that capsaicin kills cells through an alternate mechanism to the Warburg Effect. Moving forward, data collection will assess the possibility of an alternate pathway in the endoplasmic reticulum: Unfolded Protein Response (UPR), more specifically the activation of IRE1α protein coupled with GRP78 protein, and the activation of CHOP protein ultimately triggering a caspase cascade that forces cell death.

14. Isolating Aeromonas veronii from a freshwater home aquarium to Betta splenden

Juliette Valley, Haydn Rubelmann

Betta Splendens, otherwise known as Siamese fighting fish, are a highly valued species in many families' homes worldwide. Originating from the freshwaters of Southeast Asia, their vibrant colors, elaborate fins and particularly strange territorial behavior has lead to a massive popularity in keeping them as ornamental fish, allowing them to lend a significant place in global aquaculture and pet trade. Given the prevalence of infectious bacteria in home aquariums and their potential to cause diseases in both humans and aquatic animals, this research aimed to isolate specific bacterium strains, including Aeromonas spp., from such environments. A variety of laboratory techniques, including antibiotic resistance tests, were conducted to isolate, characterize, and identify a single species from a freshwater aquarium home to Betta splendens. The isolate, Aeromonas veronii,

showed resistance to many antibiotics, with its identity confirmed by Biolog phenotype microarray analysis and DNA sequencing. This study highlights the importance of understanding bacterial populations in aquarium settings to prevent the spread of infectious diseases. Aeromonas veronii is commonly found in freshwater and is capable of causing various infections. Therefore, this study underscores the need for further research on microbial diversity in aquariums and their potential impacts on aquatic life and human health.

15. Chain Branching by the NEDD4 Family of Ubiquitin Ligases Regulates Protein Degradation

Isabella Holt, Anthony Daley, Kayla Brennan, Yanfeng Li, Eric Strieter, Michael E. French

Ubiquitin chains are post-translational signals that regulate the stability, activity, and localization of eukaryotic proteins in various ways. Recent studies indicate that ubiquitin chains can be branched and that branched chains impact the proteins they are attached to through mechanisms that are distinct from those of unbranched chains. Despite evidence that branched chains are abundant in cells and have important physiological roles, our understanding of these modifications has been limited by a lack of robust methods to study them. Using a newly developed middle-down mass spectrometry approach, in combination with a debranching assay based on the proteasome-associated deubiquitinase, UCH37, we report here that the NEDD4 family ubiquitin ligases assemble branched ubiquitin chains in vitro. Multiple members of this family of E3 ubiquitin ligases, including Rsp5 from S. cerevisiae and several human orthologs, form branched K48/K63 chains, as demonstrated through autoubiquitination and substrate ubiquitination assays. In addition, we provide evidence to suggest that chain branching regulates the degradation of NEDD4 family substrates by the proteasome. These results establish a new biochemical activity for a well-defined family of ubiquitin ligases and provide a potential mechanism to explain how K63-selective enzymes redirect their chain forming capabilities to promote substrate degradation.

16. Development of a Diagnostic Tool to Detect Branched Ubiquitin Chains

William Forrest, Isabella Holt, Michael E. French

Proteins are dynamic molecules that carry out many critical functions within cells and organisms. The activities of proteins are tightly regulated, and one important form of protein regulation is through the ubiquitin pathway. Damaged, misfolded, and otherwise dispensable proteins are broken down (or degraded) by the conjugation of a small protein known as ubiquitin, which serves as a tag to initiate the degradation of the target protein. Ubiquitin can be attached to these proteins in the form of chain of ubiquitin molecules that differ in terms of their chemical linkages, lengths and conformations. It was recently discovered that ubiquitin chains, which were once thought to be exclusively linear, can also adopt branched structures. While the structures of linear ubiquitin chains are generally well understood, our understanding of the specific architectures of branched ubiquitin chains has been limited by a lack of convenient methods to study them. In this study, a deubiquitinating enzyme called UCH37, which has recently been shown to cleave branched ubiquitin chains, was used to detect the presence of branched ubiquitin chains in vitro. Point mutants in UCH37 known to inhibit its debranching activity were used to show that this method is an effective biochemical tool to probe the higher-order structures of branched ubiquitin chains.

17. "This Tastes Weird!" A Dive into the Correlation Between Drinking Water in the Tampa Bay Area and Head and Neck Cancer

Danielle Abel, Kimberly Dobrinski

Many sources have indicated a rising number of head and neck cancer rates in Florida. These rates may differ depending on location such as rural or urban areas and socioeconomic status. A factor that links these variances is the quality of the water that we drink every day. Individuals living in rural or underprivileged communities may have poorer quality water and increased cancer rates. Drinking water must be chlorinated to remove dangerous microbes; however, this may lead to disinfection byproducts potentially leading to cancer. Our research analyzes the drinking water quality in Tampa Bay and the potential correlation with the occurrence of head and neck cancer in regions with different socioeconomic status. Water samples were collected throughout Tampa Bay and tested for chlorine and bromine levels for eventual comparison. By studying existing data of high head and neck cancer, we aim to be able to correlate the researched data to our water data using statistical analysis. Additionally, this research is looking at regions across Florida grouped by income and underserved communities for links to cancer occurrence. Income

from sources such as the Census Bureau as well as cancer rates from The American Cancer Society allow us to calculate such correlations.

18. Investigating Mechanisms of Antioxidant Treatment on Drug Resistant Breast Cancer

Sofia Cuello, Kimberly Dobrinski

Breast cancer is a growing health issue in the United States, leading to significant mortality rates and a rise in drug-resistant forms. Understanding cellular mechanisms like the Warburg effect, which promotes aggressive cancer cell growth through metabolic changes favoring glycolysis, is crucial. Antioxidants show promise in cancer prevention by reducing reactive oxygen species (ROS) levels, yet their impact on cancer cell behavior is complex, necessitating further research. A cellular shift to aerobic respiration (OXPHOS) within cancer cells may induce oxidative stress and a build up of toxic ROS, as the cells lack the compensatory mechanisms to survive this internal change. The antioxidant shikonin is known to induce mitochondrial dysfunction and apoptosis in cancer cells, potentially linked to the proposed respiratory shift. This study investigates how the antioxidant shikonin affects breast cancer cells' respiratory function, potentially shifting metabolism from glycolysis to oxidative phosphorylation (OXPHOS). Initial findings suggest shikonin induces apoptosis in drug-resistant cancer cells, likely through mitochondrial targeting and a respiratory shift. Further studies will explore oxidative stress levels, understand cellular behavior upon treatment, and investigate genetic regulation.

19. Metabolic Rate in Response to an Acute Stressor of Salinity Change in Gambusia holbrooki

Kathleen Gillis, Adrianna Caporelli, Jane Groeneveld, Jeffery Grim

Eastern Mosquitofish or Gambusia holbrooki are a Poeciliidae fish that tends to live in freshwater. This species is often introduced into Florida waterways and are native in some systems as mosquito population control that are limited by salinity for expansion. The experiment tested if G. holbrooki showed an increase in metabolic rate with an acute stressor of salinity change of both higher (19 ppt) and lower (1 ppt) than their normal living value (5 ppt). There was no significance seen introducing Eastern mosquitofish into either 19 ppt or 1 ppt from 5 ppt.

20. Transcriptional Differences between Normal and Obese Zebrafish Associated with Intrinsically Disordered Proteins as a Model for Human Disease

Kimberly Dobrinski, Jusmary Mercado, Briana Alston, Jordan Gran, Shivani Desai, Byron Ward, Jee Young Kwon , Qihui Zhu, Charles Lee

This study investigates intrinsically disordered proteins associated with transcriptional differences in the model organism, Danio rerio (zebrafish), associated with obesity. Zebrafish share 70% genetic identity with humans with 84% of genes associated with diseases in humans also found in zebrafish. A human obesity model was created using zebrafish where the control fish were fed a normal diet of 0.006 grams frozen artemia while obese fish were fed with 0.06 grams frozen artemia per day. Fish livers were dissected for RNA extraction. RNA Seq was used to generate short read sequences and transcription differences were evaluated. Proteins found to be over or under expressed in obese fish were further examined for intrinsic disorder. IUPRED and Pondr have been used to investigate the level of disorder found within proteins exhibiting differential expression. GO Analysis was used to take an indepth look and cellular and molecular function. Overexpressed genes in obese fish are involved in increased production of insulin, increased receptors for insulin, increased fatty acid transport and increased inflammation. Underexpressed in obese fish include pathogen binding proteins, MHC class I genes, and G-protein coupled receptors. This work investigated proteins involved in obesity that have intrinsic disorder and may lead to disease.

21. Investigating Methylation Patterns Associated with Obesity in Danio rerio (Zebrafish)

Alexandra Walz, Kimberly Dobrinski

DNA methylation is an epigenetic pattern that maintains and changes the integrity and expression of our genes. Mammalian methylation occurs at CpG locations where cytosine is adjacent to guanine nucleotides. Patterns of genomic methylation can be quantified with Reduced-representation bisulfite sequencing (RRBS). Bisulfite converts unmethylated cytosines to uracils but is ineffectual on methylated cytosines allowing for differential methylation analysis. The study's purpose is to use Zebrafish (Danio rerio) as a model organism to compare methylation patterns between obese and control zebra fish livers. We used RRBS to observe methylation pattern changes, and how they affect subsequent gene expression in those suffering from obesity. We trimmed adaptor sequences using Trim Galore and aligned our data to a reference genome using Bismark. Following alignment we conducted methylation status analysis using SeqMonk and the R package: Methylkit. GO

Analysis was used to analyze the differential expression of specific genes and how that manifests changes in biological function. Methylation patterns have been shown to change in response to physiological stress and we are measuring if obesity can stimulate changes in methylation patterns which in turn contribute to obesity associated diseases such as non alcoholic fatty liver diseases, Type 2 Diabetes, hypertension, etc.

22. Gulf pipefish, Syngnathus scovelli, demographics, morphometrics, and body patterning in Tampa Bay

Rose Gaetano, Megan Sims, Emily Rose, Heather Mason

In recent years, seagrass beds across Florida have been declining due to water quality and temperature. Monitoring seagrass bed flagship species, like the Gulf pipefish (Syngnathus scovelli), can indicate the health of their ecosystem. We wanted to observe pipefish demographics and abundance across the year along with testing if Gulf pipefish have individually identifiable body patterning. Two sites in Tampa Bay were utilized to count, collect, and photograph pipefish to understand population dynamics and morphometrics. Pipefish morphometrics were measured using the photographs in ImageJ. Furthermore, facial and band recognitions were attempted using Wild-ID and I3S; however, these two programs were unsuccessful in matching individuals. Pictures were then examined to identify if individuals could be matched across time using uniquely identifiable patterning. The pipefish abundance and demographics were seasonally dependent with more males collected than females. Females tended to have a longer average standard length than males each month. Gulf pipefish had unique facial and band patterning that allowed them to be matched across recaptures and will strengthen the mark-recapture population estimations that occurred simultaneously with this study. Monitoring the Gulf pipefish population can provide information on the health of seagrass bed ecosystems with the recent seagrass declines in Tampa Bay.

23. College Students and Dietary Habits: Correlations between Nutrition Course and Eating Behaviors

Nicole Swam, Melissa Williams

Personal factors that may affect diet choice include beliefs and knowledge. One's environment includes the social forces present, such as the education system and interactions between professors and classmates. Albert Bandura's social cognitive theory states that one's decision making involves the relationship between personal and behavior

factors, which are directly influenced by environment (Bandura, 1986). The purpose of this study was to determine if differences exist in dietary habits between students who are currently taking an undergraduate-level nutrition course and students who have not taken an undergraduate-level nutrition course. The Rapid Eating Assessment for Participants (REAP) was used to assess dietary habits within differing academic populations. There was not a significant relationship between students currently taking a nutrition course in comparison to students who haven't taken a nutrition course and their overall REAP score. However, there was a significant relationship between the two groups and how often they reported to eating meals from sit-down or take-out restaurants, fried foods, and sweets in an average week. These results suggest that access to nutrition knowledge directly affects diet choices and that differences do exist between students across different pedagogies regarding dietary habits.

24. Investigating Resveratrol and its Mechanisms on Drug Resistant Breast Cancer

Ryan Stewart, Sofia Cuello, Kimberly Dobrinski

Breast cancer will develop in about 1 in 8 women in their lifetime, and is responsible for more than 40,000 deaths per year. Currently, drug resistance is a major reason for poor prognosis which keeps mortality rates high each year. Resveratrol, a potential treatment option, is a natural occurring antioxidant found in the skin of grapes and various plants. In previous studies, resveratrol has shown promising anticarcinogenic effects in multiple cancers such as prostate, pancreatic, colorectal and others. Therefore, this study aims to investigate resveratrol's effects on both drug-resistant and drug-sensitive breast cancer using MDA-MB-231 and MCF-7 cells respectively. Preliminary research from this study has shown resveratrol to cause cell death in both MDA-MB-231 and MCF-7 cell lines. These results were produced via CyQUANT assay which measured cell viability at various resveratrol concentrations (100μM, 150μM, and 200 μM). As resveratrol concentration increased, a decrease in cell viability was observed indicating resveratrol's promising apoptotic effects.

25. Does Nutrition Education Vary in the Ability of College Students from Different Majors to Identify Dietary Myths?

Hannah Kowanes, Melissa Williams

With a wealth of resources spanning across the internet, the circulation of inaccurate nutrition information can become misleading. This can be imperative to one's function in society, health, and well-being. As seen in the Social Cognitive Theory (Bandura, 1960), observational inherited learning can be harmful when following the nutritional practices of uneducated individuals. The purpose of this study was to determine if there's a difference in college students enrolled in separate majors' ability to distinguish between inaccurate and accurate dietary information when presented together. Also, differences between students' duration of social media usage and performance on an administered nutritional survey were examined. College students (18-22 years old) from two courses (nutrition and microeconomics) were presented with nutritional survey questions. There were 155 respondents, 85 females (n=85, 35.9%) and 70 male participants (n=70, 29.9%). There were 33 (21.2%) participants from a nutrition course and 122 (78.7%) respondents from a microeconomics course at The University of Tampa. There was sufficient evidence, testing at the 0.05 significance level, to indicate that the median survey scores from the nutrition and economics courses are different. There also was a difference in survey scores based on different durations of social media usage. This supports the idea that college students with an entry-level nutrition education are more likely to recognize dietary misinformation accurately, to promote better health and well-being.

26. Assessing food webs in Tampa Bay using baited remote underwater video (BRUV) and chlorophyll a analysis

Emma Robbins, Heather Mason

Marine food web dynamics have long been a source of interest due to economic and ecosystem value. Most assessment tools in marine foodwebs are invasive; a more sustainable method to sample species abundance are baited remote underwater video systems(BRUVS) which observe marine life noninvasively. Phytoplankton, the primary producers, are commonly considered the foundation of the food web and are measured by abstracting chlorophyll a from the water column. The relationship between chlorophyll a concentration, fish abundance and diversity were investigated across a range of shallow water habitats in Tampa Bay. In the first phase of this study chlorophyll a was isolated from water samples from benthic habitats including sand, seagrass and mangrove as well as man made structures. BRUVS were used to identify and quantify fish species observed in

the sampling locations. There were significant differences found between chlorophyll a and habitat, the experiment is on going and further replicates will be collected throughout the year. Chlorophyll a was not significantly correlated with fish abundance or diversity, but future investigation in the larger data set will break fish into functional groups by feeding type to determine if phytoplankton presence relates to planktivores in the water column.

27. Possible Isolated Population of Invasive Rhinella Species in Lake Placid, FL

Conor Milligan, Abigail Kirkpatrick, Jacob LaFond

Previous studies by Meshaka et al. 2006 & 2010 described an isolated population of invasive cane toads (Rhinella sp.) around Lake Placid, Florida that had become established in a disturbed, urban environment despite being surrounded by inhospitable xeric uplands. This population was used as a model to study the reproductive habits of invasive Rhinella and niche overlap with the native southern toad (Anaxyrus terrestris). After over a decade of rapid urban development throughout Florida, we completed subsequent night surveys of the same population to determine 1) if this population is still isolated from other Rhinella populations in south-central Florida and 2) if A. terrestris are still present. To date, we have completed three night surveys of the area and recovered 25 Rhinella sp. and 5 A. terrestris. One location sampled had only A. terrestris present, suggesting the Rhinella population could still isolated. If these findings prove to be accurate, this could be a good study population to understand the long term effects of Rhinella invasion in Florida.

28. There is something in the water

Kimberly Dobrinski, Aysel Khalil, Savannah Knight.

Head and neck cancer affects the upper part of the aerodigestive tract, the oral cavity, pharynx, and larynx. Factors that increase the risk are tobacco use and alcohol ingestion, but genetics also play a part. With advancing research, other factors like exposure to water contamination have been identified as a source for risk. These include the involvement of water contamination with the disinfection byproducts that are formed when chlorine reacts with organic matter, particularly trihalomethanes (THMs) and haloacetic acids (HAAs). THMs are carcinogenic and can accumulate in water sources over time and can cause cancer. In a similar vein, HAAs, even though regulated, may exceed safe levels in some water treatments. This study will explore associations between head and neck cancer prevalence and the concentrations of free bromine and chlorine in specific Tampa Bay zip codes. In addition, it aims to explore the relationship between incidence in oral cancer and

disinfectant byproducts present in the same areas. They sample water from various buildings within each zip code, using deionized water as the blank for each. The study could help inform the water treatment practices that have been adapted to mitigate the cancer risks through water contamination.

29. Variable Star Photometry for Theoretical PL Equation Verification

Jacob F. Hansman, Dr. Amy Lien, Dr. Michael Fitzgerald, Gina Pantano

Photometric analysis via the Python pipeline, astrosource, was performed on 3 variable stars –OP Puppis, X Ari, and RU Scl– using cadenced imaging from the Our Solar Siblings observatory network in order to verify theoretical RR Lyrae period-luminosity equations proposed by Catelan et. al. (2004, 2008). Luminosity pulsation periods of 2.597 days, 0.652 days, and 0.494 days for OP Puppis, X Ari, and RU Scl respectively, have been determined. Average distances obtained for OP Puppis, X Ari, and RU Scl across the Bessell V (5448 ˚A) and SDSS ip (8700 ˚A) filters are (2738±26)pc, (565.0±25)pc, and (780.5±34)pc, respectively. These results indicate that the period-luminosity equation evaluated for the PanSTARRS Z (7545 ˚A) filter are inadequate when comparing resultant distances against Gaia DR3 geometric parallax measurements, but the equations for the Bessel V and SDSS ip filter are currently adequate with average differences against Gaia results at 3.8% and 2.2%.

30. Verification of Stellar Parameters Abundances and Errors (SPAE)

Antonio Fedi, Simon Schuler

Stellar chemical abundance codes play a pivotal role in the analysis of stars, aiding astronomers in unraveling the mysteries of our universe. One such code, SPAE (Stellar Parameters Abundances and Errors; Schuler et al. 2021)-- a Python code that uses a state-of-the-art Bayesian method to self-consistently propagate uncertainties from the stellar atmosphere solutions in calculating individual abundances-- has become another tool in this pursuit. Ensuring the accuracy of SPAE is paramount, given its use in the scientific community, so I have undertaken the task of verifying SPAE by developing an independent Python code designed to rigorously assess SPAE's ability to produce reliable stellar abundances. The testing procedure includes obtaining measured equivalent widths, atomic data, and abundances from the literature, formatting linelists in a SPAE-readable format, executing SPAE, and comparing the results to those in the literature source. This analysis entailed a comprehensive examination of abundances and stellar parameters, all

crucial components of accurate chemical abundance calculations. I will present the results of our analysis using binary dwarf and subgiant stars from Yong et al. (2023), as well as the results from our analysis of Bensby et al. (2017). This research not only underscores the critical importance of accuracy in stellar chemical abundance analyses but also offers a versatile methodology for assessing their reliability, thereby enhancing the precision of stellar abundance investigations.

31. Humpback Whale Responses to Boat Density and Sea Conditions

Kaitlyn Ho, Eman Khwaja, Kimberly Dobrinski

Whale watching is a multi-billion-dollar industry that is growing increasingly popular in ecotourism and plays a pivotal role in the research of whale populations. Passengers are taken into the ocean to see groups of whales while being engaged in conversations about marine life and conservation. Data is collected on trips and contributed to various research projects as well as population surveys. The growth of whale watching has been beneficial both economically and scientifically. However, this increase in boat traffic also brings growing concern for negative impacts on whales. It has been observed that disturbances from whale watching vessels can cause behavioral changes and compromise their survival. This research analyzed the relationship between boat quantities and the frequency of Humpback Whale behaviors observed in Stellwagen Bank and additionally the behavior changes influenced by varying sea conditions. Behaviors associated with stress were seen with the presence of more boats and in rougher sea conditions. The data can hopefully be contributed to improvements in whale watching guidelines as well as recreational boating regulations and better pinpoint where change needs to occur.

32. Toxicity of compounds isolated from marine microorganisms on cancer cell lines

Peyton Wilson, Evelyn Martinez, Christine Theodore, Eric Freundt

Natural compounds have gained increasing attention in biomedical research for their potential therapeutic properties. In this research, we aimed to assess the cytotoxicity of selected natural compounds isolated from marine-sediment bacteria on mammalian cells. Cells were exposed to varying concentrations of the natural compounds for a specified duration and cytotoxicity was evaluated by fixation, crystal violet staining, and spectrophotometric analysis. Our findings reveal differential cytotoxicity profiles among the tested natural compounds, with some compounds exhibiting dose-dependent cytotoxic effects. Interestingly, one extract displayed increased viability at the highest

concentration in two cell lines, indicating that it might provide cytoprotection or enhance proliferation. Previous reports have indicated the pharmaceutical potential of marine microorganism-derived compounds due to their diverse chemical structures and bioactivities. These compounds have shown promise in exhibiting anti-inflammatory, antioxidant, and anticancer properties. However, specific evidence demonstrating cytoprotective effects on mammalian cells is scarce. Further research is warranted to explore the mechanisms underlying any potential cytoprotective effects of this compound.

33. Synthetic storm analysis of Charlotte Harbor, FL: How does a changing climate impact hurricane characteristics?

Darri Stuber, Nicholas Grondin

Charlotte Harbor, a coastal town located in southwest Florida, has been impacted by three major hurricanes in the last 20 years - the most recent being the category four storm Hurricane Ian in 2022. In this study, we use two sets of synthetic storms passing within 100 km of CH, representing the early 20th-century climate (EC, 1901–1930) and present climate (PC, 1991–2020). Genesis, lifetime maximum intensity, and landfall locations along with duration and intensity components were used to characterize the storms in a k-means clustering algorithm. The data was classified into k=6 clusters that were each analyzed to detect a significant difference in the proportion of EC and PC storms. This analysis found the cluster with the weakest local maximum intensity to have a significantly greater proportion of EC storms, while the cluster with the second highest local maximum intensity had a significantly greater proportion of PC storms. The defining characteristics of these significantly proportioned clusters serve as a function to determine how a changing climate will impact the behavior of tropical cyclones that can devastate southwest Florida and beyond.

34. First insights into the phylogeography of Ligia from the Papahānaumokuākea Marine National Monument

Alexandra Larson, Annabelle Bork, Carlos Santamaria

The Hawaiian Islands are a chain of volcanic islands found in the Pacific Ocean, with eastern islands being older than western ones. These eastern islands are uninhabited, highly remote, and protected as part of the Papahānaumokuākea Marine National Monument. Although they harbor a high degree of endemic species, the biodiversity of these islands is threatened. These threats highlight the need to further our understanding

of the biodiversity of these islands. One group of interest as they may harbor previously unknown biodiversity is the isopod genus Ligia. These isopods are mostly intertidal and are characterized by their limited dispersal potential that restricts gene flow between populations. This is thought to lead to the accumulation of genetic differences and speciation even across small geographic scales. In this study, we use molecular approaches previously used to describe Ligia species from the Hawaiian Islands to characterize Ligia specimens from the island of Nihoa in the Papahānaumokuākea Marine National Monument. Our goal is to determine: (a) whether Nihoa Ligia harbor unique genetic lineages; (b) the relationship of any such lineages to Hawaiian Ligia species; and (c) whether any evidence suggesting Nihoa Ligia represent a novel species exist. Using molecular approaches, we determined that Nihoa Ligia harbor a unique genetic lineage that is divergent from all other Hawaiian Ligia. This lineage is sister to L. hawaiiensis, a species from the island of Kauaʻi. Our analyses also suggest Nihoa Ligia are unique enough to represent a novel species in need of description.

35. The Contribution of the Oral Microbiome to Health and Disease

Alicja Gwozdz, Eric Konviser, Grace Spiegelhoff, Alisha Poothurail, Isabella Minuta, Eric Freundt

The oral cavity ranks second to the gut for harboring the most diverse microbiome within the human body. The ability of the oral cavity to house such a vast microbiome is the presence of different surfaces, such as hard surfaces, which consist of teeth, and soft surfaces, which includes the tongue, cheeks, gingival sulcus, tonsils, soft palate, and buccal mucosa. The oral microbiome plays a crucial role in maintaining health by protecting the oral cavity and preventing disease, and the type of microbiota present in the oral cavity can also determine what diseases an individual may be susceptible to both orally and systemically. A comprehensive literature review was performed to compile a concise overview of the different effects of various oral species. The presence of these species in the oral microbiome of nine individuals was then evaluated. Analysis revealed significant correlations of some oral pathogens with diet and oral hygiene practices.

36. Sonicating toothbrushes do not cause significant depletion of obligate anaerobic oral bacteria

Eric Konviser, Alicja Gwozdz, Grace Spiegelhoff, Alisha Poothurail, Isabella Minuta, Eric Freundt

The oral microbiome plays a critical role in both oral health and disease. Brushing teeth is fundamental to oral hygiene practices to maintain a healthy oral microbiome. Brushing methods may influence the composition of the oral microbiome, with potential implications for oral health outcomes. Sonicating toothbrushes utilize high-frequency vibrations to disrupt plaque and debris, introducing shear forces and increasing oxygenation within the oral microbiome. This study investigated the impact of electric sonicating toothbrushes on the oral microbiome composition compared to manual toothbrushes, with focus on obligate anaerobes. Nine individuals who regularly used manual toothbrushes were selected in the study. Six were given sonicating toothbrushes, and three continued using manual toothbrushes. We hypothesized that increased oxygen content produced by sonication would decrease bacteria sensitive to higher oxygen levels. However, our results indicate no significant differences in the oral microbiome composition between individuals using sonicating and manual toothbrushes. Despite introducing higher oxygen levels in the oral microbiome environment by both manual and electric toothbrushes, the observed changes were not statistically significant between the two groups. This suggests that while both brushing methods may increase dissolved oxygen content, they do not differ significantly in their impact on the oral microbiome composition.

37. Examining Dietary and Morphometric Trends of Invasive Florida Cane Toads (Rhinella sp.)

Michael Garvey, Madison Harman, Carrie De Jesus, Sam Wisely, Christina Romagosa, and Jacob Lafond

Introduced invasive species are becoming an increasingly widespread issue throughout the planet. Cane toads (Rhinella Marina) are a species of neotropical toad from South America known to be one of the most invasive species globally. Currently their invasive range is spreading through Florida and while populations have been studied in other countries, little to no research has been on the toads spreading locally throughout the state. Our study took samples of 12 populations throughout Southern and Central Florida to examine morphometric measurements of their limbs and stomach contents to examine which species are at threat of predation. The limb measurements show that females living on the invasion edge had statistically longer limbs, larger hearts, and less fat suggesting

adaptation for increased locomotion and for males it showed larger stomachs and kidneys suggesting adaptation for increased digestion. The examination of their diets exhibited organisms from 12 different taxa including both vertebrates and invertebrates showing their nondiscriminatory predation. By examining these factors, we were able to determine how well the toads are acclimating to this new area and what ecological impacts they may have on other native species in the future.

38. Liquid-liquid lithium extraction with tripodal CMPO-based ligands

Caroline C. Graham, Eric J. Werner

Lithium and its applications in emerging technologies have received increasing attention in recent years. The popularity of electric vehicles, with their lithium-ion batteries, is largely responsible, but lithium-ion batteries are also found in phones, computers, and other forms of common technology. The issue with lithium-ion batteries, however, is proper disposal - as of now, recycling efforts involve expensive smelting and leaching processes that pollute the environment and are largely inefficient. Therefore, efficient recycling of lithium from discarded electronics remains a worthwhile goal to address the growing global “e-waste” problem. This project examines a chemical process for recycling lithium, with the ultimate goal of optimizing a liquid-liquid extraction method by varying the extraction time, the concentration of extractant versus metal, and the acidity of the lithium solution. Preliminary results indicate modest extraction efficiency values of approximately 12% when using a 1:1 extractant to metal ratio and a 20 hour extraction time.

39. Investigation of Gene Transcription Modifications Associated with Obesity in Zebrafish (Danio rerio)

Kimberly Dobrinski, Ruel Stephenson Jr

This study investigates transcriptional differences in the model organism, Danio rerio (zebrafish), associated with obesity. Zebrafish share 70% genetic identity with humans with 84% of genes associated with diseases in humans also found in zebrafish. The zebrafish model was used to investigate early gene transcription changes associated with obesity. The control fish were fed a normal diet of 0.006 grams of frozen artemia while obese fish were fed 0.06 grams of frozen artemia per day. Body Mass Indexes between obese and controls were analyzed using ANOVA (p value = 1.04e-11). After 8 weeks the fish livers were dissected for DNA and RNA extraction. RNA Seq was used to generate short read sequences and transcription differences were evaluated using the following bioinformatic

tools: Trimgalore, STAR, Docker, and Stringtie. Preliminary analyses showed that genes overexpressed in obese fish included: preproinsulin, fatty acid binding proteins, amnionless, and cubilin. These overexpressed genes in obese fish are involved in increased inflammation. Overall, genes under-expressed in obese fish are involved with a reduced immune system and reduced signaling pathways. This work has demonstrated that an obese zebrafish model can be used to investigate obesity-related gene expression to uncover genes associated with disease.

40. Identifying Macrochelid mites of Tampa Bay and determining their relationship with Drosophila spp. hosts using scanning electron microscopy (SEM)

Anngelyk M. La Luz Maldonado, Mikayla A. Rothschild, Aidan Soldan, Markayla K. Harrison, Emily S. 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. Some 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 culture and identify Macrochelid mites in Tampa Bay and find evidence for whether they are harming fly hosts using scanning electron microscopy (SEM). Mites were collected from the wild and four populations were generated in the Durkin Lab. We identified two species of Macrocheles and one unidentified species belonging to the family Macrochelidae. 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.

41. What's in Our Water? Identifying bacteria in Tampa recreational water

Evelyn Martinez, Maryn Shilale, Jeannette Bacchia, Caitlin Katz, Lauren Logsdon, Michelle Roux-Osovitz

While bacteria are part of all ecosystems on earth, pathogenic bacteria such as Escherichia coli and Staphylococcus species pose a risk to human health. Recreational waterways are monitored for fecal indicator organisms to minimize adverse health conditions, but the presence of other pathogens may go undetected. Between 2019 and 2021 a University of Tampa research team sampled recreational waters across Tampa Bay to test for the presence of Staphylococcus aureus and Methicillin-resistant S. aureus (MRSA). Of the samples that displayed common microbial markers for S. aureus, many lacked the S. aureus genetic marker NucA, indicating the presence of other potential pathogens. To identify these organisms, the 16srRNA gene was amplified by PCR and sequenced. MEGAx software and the NCBI GenBank database analyzed the sequence results, and various genera were identified. Our data suggest the presence of mostly non-pathogenic environmental bacteria such as Cobetia, Exiguobacterium, 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 project's findings provide insight into the diversity of organisms in Tampa Bay and will help guide new approaches to determining the health of our waterways.

42. An Analysis of Foot Strength Variation in Ecotypes of the Sea Slug Elysia crispata

Julia Piper, Grace Ferguson, Erika Molina, Samantha Schlegel, Michael Middlebrooks

Elysia crispata is a photosynthetic sacoglossan sea slug with two morphologically distinct ecotypes. The clarki ecotype typically lives in low wave energy mangrove swamps and has a thin green foot. The crispata ecotype lives on coral reefs/rubble in higher wave energy environments and has a thicker opaque white foot. Fifteen specimens from each ecotype were collected from Key Largo, FL, USA and their individual foot strength was tested using a flume apparatus with varying strengths of waterflow. The length of time the slug withstood this flow before being dislodged, as well as the velocity of the flow during dislodgement was recorded. The clarki ecotype was dislodged at higher velocities or failed to be dislodged more often compared to the crispata ecotype. The clarki ecotype may have increased mucus production, allowing them to better adhere to the limestone rather than rely solely on foot strength. Additionally, the crispata ecotype may be able to persist in higher wave energy areas by utilizing protected microhabitats.

43. Investigation of Disordered Eating Habits in AROTC Cadets

Alexandra Drushal, Dr. Melissa Williams

The military and its counterparts are built on the foundation of physical fitness and nutrition. However, there are a few trends that dominate the field when discussing the topic of nutrition and the military, to include ”disordered eating” and “body dissatisfaction” that relate to the imposed physical and body composition standards of the organization. This study investigates the common themes regarding the topic of disordered eating habits, such as, but not limited to, excessive exercise, counting and restricting calorie consumption, in relation to the Army’s physical assessment regulations and Army ROTC Cadets.

44. Microbial Analyses on Cane Toad Swab Sample for Potential Pseudomonas sp. Presence and Identification

Maia Ivette Santiago Rodríguez, Haydn Rubelmann, and Jacob LaFond

Cane toads (Rhinella marina) are large neotropical toads that have become established as invasive species in many countries, causing ecological disruptions worldwide. One way these toads can potentially disrupt local ecosystems is by acting as a vector species carrying amphibian pathogens, particularly the fungal pathogen Batrachochytrium dendrobatidis (Bd), due to Rhinella species exhibiting high tolerance to Bd. Previous studies have indicated the epidermal microbiome plays a role in facilitating the Bd immunity in some amphibian species, for example, according to Weitzman et al., 2019, the cane toads’ skin-inhabiting microbes (potentially Pseudomonas fragi) play a large role in pathogenic resistance, fortifying the toads’ immunity to fungi, such as Bd, yet still allowing for its proliferation. The experiment's objective is to identify Pseudomonas sp. acting as the potential inhibitor against Bd. Employing methods such as gram-staining, differential/ selective media, biochemical assays, PCR, and others, bacterial samples gathered from a cane toad in Tampa, FL, underwent testing, ultimately confirming the presence of Pseudomonas fragi. The study delves into potential environmental factors influencing the prevalence of Pseudomonas fragi, suggesting varied routes for its existence. Furthermore, it suggests avenues for future research, including comprehending symbiotic interactions and investigating the impact of Pseudomonas on other hosts.

45. Survey of the Occurrence of Ear Mites (Otodectes cynotis) in the Ear Cytologies of Domesticated Pets

Maia I. Santiago Rodríguez, Paige Bathke, Caylee Watters, Emily Durkin

The objective of this study was to identify the occurrence of ear mites in the ear cytologies of domesticated pets and the prevalence of bacteria. Owning domesticated pets is beneficial to humans in many ways, but they have to be treated with care. Parasites impose many different health effects on pets that can even negatively affect humans. Using a convenience sampling method, samples prepared onto a slide from a swab technique in the external ear canal of domesticated dogs and cats were analyzed to determine the presence of the parasite (Otodectes cynotis) and bacteria. The convenience sampling method displayed the presence of the ear mite (Otodectes cynotis) in both dogs and cats. The analysis also displayed the presence of bacteria at the same time as the presence of the ear mite (Otodectes cynotis). It is suspected that different means of preventative care contributes to the presence of parasites along with different grooming habits. It is also suspected that the sociable lifestyle of domesticated animals contributes to the exposure of parasites. It is important to use preventative medications such as flea, tick and heartworm preventatives along with regular veterinary check ups to prevent and control parasites on domesticated pets.

46. The Effect of Salinity on the Photosynthetic rate of Cladophora Algae.

Paige Potter, Sophia Demitrio, Hailey Smith, Matthew Vencel, Jeffrey Grim

The purpose of this experiment was to explore the impacts of varying salinity levels on the photosynthetic rate of algae. Cladophora algae was collected from the stream in Plant Park and exposed to two different salinity levels, eight and sixteen parts per thousand (ppt). The photosynthetic rate was monitored over a two-week period and taken each week by an optical dissolved oxygen (DO) probe at a constant salinity of twelve ppt. This measured the amount of oxygen that diffused across the cell membrane and gave us the photosynthetic rate for each sample. The results showed an increase in the average photosynthetic rate when exposed to eight ppt and a decrease in the average photosynthetic rate when exposed to sixteen ppt. Although the specific impacts of salinity on algae can vary depending on the species, these findings demonstrate that higher salinity levels have a negative impact on the photosynthetic rate of Cladophora algae.

47. Investigation of Immune Related Gene Transcription Differences Associated with Obesity in Danio rerio (Zebrafish)

Alyssa DiPietro, Briana Alston, Jordan Gran, Shivani Desai, Byron Ward, Jee Young Kwon, Qihui Zhu, Charles Lee, Kimberly Dobrinski

Obesity debilitates the immune defense system, resulting in susceptibility to disease. The Center for Disease Control and prevention has provided statistics displaying that obesity correlates with covid-19 hospitalization and death. Additionally, obesity can increase the risk of getting cancer. Danio rerio, also known as zebrafish, is a model organism for humans. For this study, one fish group was fed a regular diet (0.006 g of artemia/day), and the other fish group was fed a heavier diet (0.06 g artmenia/ day), resulting in normal and obese fish. Fish livers were dissected and transcriptome sequencing was carried out. The most overexpressed and underexpressed genes in obese fish compared to normal fish were observed. Three of the underexpressed genes contained an ortholog to the human gene, IFI44L which aids in the immune system, is a tumor suppressor, and is involved in the Ras/MAPK pathway. Additionally, an overexpressed human ortholog, ITLN1 was expressed and contains c-type lectin domains which may be compensation, and is involved in the P13k/AKT pathway. Two more obese fish were additionally observed. A principal component analysis and heat map were created to observe associations and significance in expression to a normal fish.

48. Molecular Insights into the Genetic Diversity of two Hawaiian Isopod Species

Ethan Toback, Carlos Santamaria

The Hawaiian Islands are home to numerous endemic species found nowhere else in the world. Several of the endemic species are thought to have originated from radiations that took place in the Hawaiian Islands, as an ancestral species separated into several species. Such radiations have been reported in several terrestrial organisms; however, they were thought to not have occurred in coastal or marine organisms from the Hawaiian Islands. Recent molecular studies have shown that poorly dispersing coastal invertebrates from the Hawaiian Islands harbor previously unknown levels of biodiversity likely representing radiations. For instance, Ligia isopods have been shown to harbor several cryptic genetic lineages representing new species. However, not all coastal invertebrates in the region exhibit such patterns. Alloniscus oahuensis, an isopod commonly found in sandy beaches in the Hawaiian Islands, does not exhibit any genetic differentiation between populations. These findings indicate that our understanding of the biodiversity of poorly dispersing invertebrates in the Hawaiian Islands is limited and in need of further study. In this study,

we used molecular approaches to characterize museum specimens of two additional isopod species found in the Hawaiian Islands: Neonaesa rugosa and Joeropsis hawaiiensis. We report contrasting patterns of cryptic diversity, with the former exhibiting high levels of differentiation between Hawaiian localities and the latter not exhibiting any genetic differentiation

49. Elysia chlorotica, a Sacoglossan Sea Slug from New England, Found in Tampa Bay

Samantha Schlegel, Louis John Ambrosio, Michael Middlebrooks

Elysia chlorotica, a sacoglossan sea slug, has a reported distribution from Nova Scotia to Texas. Reports of Florida sightings are uncommon, unsubstantiated, and scarce on details. In February 2024 a population of E. chlorotica near Ruskin, Florida was discovered providing a unique opportunity to study this animal in Florida. To understand if the population found in Florida is the same as the New England population, where they are most common, a series of metrics including gross morphology, radular tooth morphology, feeding ecology, and life history were recorded to compare the Tampa Bay population to the New England population. Both populations display synchronized senescence, a Vaucheria spp. diet, and similar gross morphology. This study aims to focus on radular morphology using scanning electron microscopy (SEM) as a discerning characteristic. Scanning electron images reveal the radulae to have similar tooth serrations, housing depressions, and overall tooth shape between the two populations. Molecular data is required to confirm the populations are definitively the same species, but radula morphology is a useful metric to start understanding this relationship. Our initial analysis suggests that both the Ruskin, Florida and the Massachusetts populations likely represent the same species.

50. Intestinal Parasite Survey of Gallus gallus in Centennial Park, Tampa, Florida

Emily Durking, Katelyn Cioffi, David deGuzman, Thaydn Harpin, Ruel Stephenson Jr

This study serves as an observational survey of the existence of intestinal parasites in the feral Gallus gallus population in Centennial Park, located in Ybor City. Using knowledge attained through an introductory Parasitology class, students hypothesized that an urban feral chicken population would contain high levels of intestinal parasites. Using basic collection techniques, students gathered a multitude of chicken feces and used sugar floatation to observe the presence of such parasites. Their main findings included those of three different taxa, Nematoda, Protozoa, and Trematoda. Researchers discussed the

dietary differences between feral and domestic chickens which could be linked to feral chickens' high parasitic prevalence. This work has demonstrated that urban feral chickens experience a high susceptibility to parasitic infection which negatively affects their fitness.

51. In vivo imaging for quantitation of cellular regeneration in Dugesia japonica exposed to Bd fungal metabolites

Tomasina Cardone, Michelle Roux-Osovitz

Batrachochytrium dendrobatidis (Bd) fungus causes Chytrid infections which have decimated global amphibian populations and species biodiversity. A wildlife prophylactic made from the Bd fungal metabolite illicit an immune response in laboratory amphibian in a similar way as a vaccine, inducing a host immune response without the threat of disease/death and with the added benefit of sustained immunity. For the Bd metabolite vaccine to be a viable treatment option in wild amphibious habitats, the effect of the Bd metabolite on organisms co-existing in these amphibian habitats requires further investigation. We have developed and implemented methodology to expose the planarian to Bd metabolites post infra-auricle anterior amputation for 72 hrs. To quantitate cellular growth rates during regeneration we adapted an in vivo ethanol fixation method coupled with DAPI staining and analysis of cell density using Image J. Methodology for immobilization practices include treatment of planarians with 3% ethanol which has shown certain negative affects on planarian cutaneous health. Here we present the results of 3% ethanol treatment with cutaneous lesions on planarians exposed to metabolite. These findings allows us to further develop methodology in quantitating cellular growth rates during regeneration with exposure to Bd metabolite.

52. Transcriptome Analysis of the Eastern Oyster (Crassostrea virginica) When Exposed to Extreme Salinities

Blake Busch, Luke Talham, Kimberly Dobrinski, John Ambrosio

Oysters are a vital part of the Florida estuarine ecosystem and commercial fisheries industry. They protect estuarine environments by preventing erosion from storms and provide essential habitat and structure for other marine species. Oysters comprise the largest portion of the United States’ aquaculture production and they offer a way to address global food insecurity. Despite these benefits, the eastern oyster (Crassostrea virginica) faces multiple ecological and anthropogenic threats, including pollution, climate change, overharvesting, and salinity change, ultimately leading to an 85% decline in global oyster

reef distribution. Few studies have used transcriptome sequencing to analyze variable gene expression and for pathway analysis in eastern oysters as a response to stressful salinities as an isolated variable. This project will utilize transcriptome sequencing to examine how extreme low and high salinity events influence the expression of genes and alter pathways related to stress response in eastern oysters. We hypothesize that when eastern oysters are exposed to stressful salinity conditions, molecular pathways related to stress response, including the ER associated degradation pathway and the unfolded protein response pathway, will be upregulated. Further understanding of these molecular pathways will provide insight into the eastern oyster's stress response system and help guide future work in oyster sustainability.

53. Distance Traveled versus Maximum Intensity of Hurricanes

Taylor Cady, Nicholas S. Grondin

The objective of this project was to understand the role that distance traveled plays in the lifetime maximum intensity (LMI) of North Atlantic (NATL) and eastern North Pacific (EPAC) tropical cyclones (TC) using Esri ArcGIS Pro. To do this I examined the influence of how far a TC travels between genesis and its LMI and examined the correlation between this distance and LMI. A total of 147 EPAC storms and 141 NATL storms were studied between 2015 and 2022. EPAC TCs developed more rapidly with a higher percentage of storms reaching major hurricane-strength (27.89%) when compared to NATL's major hurricane-strength TCs (21.99%). while there was a higher percentage of hurricane-strength TCs (24.11%) compared to the EPAC's hurricane-strength (21.77%). Using Spearman's Rank Correlation, I found that for both the EPAC and the NATL the distance between genesis and LMI points had a strong, statistically significant positive monotonic relationship (EPAC: $\rho=0.7724$, $\rho <0.0001$; NATL: $\rho=0.7434$, $\rho <0.0001$). The distance that the TCs traveled was compared in the EPAC to the NATL using a Welch Two Sample t-test which showed a statistically significant difference in the distance traveled from TC genesis to LMI ($t = 3.406$, $p < 0.001$).

54. Effects of Environmental Disturbance on Bird and Parasite Presence

Alexandra Larson, Katherine Guiterrez, Amber Brace

Zoonoses are parasites that are readily transferred between animals and humans through various forms of transmission. Birds are one group of organisms capable of carrying these parasites and have been shown to transmit Influenza A, West Nile Virus, Lyme Disease, and bacteria genera containing antibiotic resistance to humans. In Florida, both residential and

migratory species are able to carry these parasites. Migratory birds include those that utilize the Atlantic Flyway which serves as a migration route for various species in the fall and spring seasons. Within a given area, both migratory and residential species can encounter environmental disturbances such as foot traffic, construction, weed-killing chemicals, and noise and light pollution. These anthropogenic alterations can negatively impact organisms leading to physiological changes including disruptions in reproduction, development, and immune function. Animal, human, and environmental health are inextricably linked such that when one is disrupted, the other two inevitably suffer. Therefore, determining whether environmental disturbance affects the presence and diversity of birds and parasites can provide insight to effects that anthropogenic factors have on both animal and human health. In this study, we are using bird feeders with cameras to monitor species present at The University of Tampa. Fecal samples are collected weekly and analyzed using fecal floatation to identify which parasites are present. Data collected over the course of one year (August 2023 - April 2024) will be analyzed to determine whether bird and parasite presence differs between seasons with or without migration and areas of moderate and high disturbance.

55. Cryptic Diversity of Ligia novizealandiae Isopods from Te Ika-a-Māui

Lauren Gardner, Taylor Cady, Carolos A. Santamaria

Ligia are a globally distributed genus of Isopods mostly found in the intertidal region of rocky coastlines. Due to their poor dispersal capabilities, Ligia in isolated locations often harbor highly unique genetic lineages. In some instances, these lineages have been shown to represent cryptic species (two or more morphologically similar species). For instance, high levels of cryptic diversity within Ligia have been reported from the islands of Hawai‘i, the Caribbean region, the coastlines of South Africa, and the Seychelles. Herein, we use molecular methods to characterize populations of Ligia novizealandiae from Aotearoa New Zealand to determine if cryptic diversity is found within this remote region of the Southwest Pacific Ocean. To this end, we sequenced 3 mitochondrial genes and 2 nuclear genes for individuals from 6 localities in Te Ika-a-Māui / North Island of Aotearoa New Zealand. Our findings indicate the presence of three distinct genetic lineages in L. novizealandiae: a lineage found in four localities of the western coastline of Te Ika-a-Māui/ North Island, another found in Moa Point at the southern end of the island, and a third lineage from Waiwera Beach in the northeast.

56. Species Diversity Comparison of Seagrass Beds at Fort DeSoto State Park

Abigail Kirkpatrick, Anna Ondre, Giovanni DiVentura, Grace Beane, Heather Mason

Seagrass beds and shallow seagrass-dominated estuaries are important ecosystems both ecologically and economically. These habitats are incredibly productive, yet are at risk due to the effects of anthropogenic climate change. Fort DeSoto State Park at the south end of Tampa Bay was chosen to test for potential differences in species diversity because the park contains two distinct beaches, a more human-impacted North Beach and a less human-impacted East Beach. Throughout the experiment, water quality parameters were measured in addition to average seagrass blade height and density. Once grass species were identified, seven replicates per transect were completed, gathering species richness and abundance for the range of organisms collected with a push net. Once analyses were run on the Margalef's Index values, species evenness, and Shannon's Index values from each beach, it was found that there was a significant difference in the Margalef's and Shannon's Index values, concluding the difference between the North and East beach. Because Florida beaches are such important tourist attractions and Florida's coasts are ground zero for climate change in America, the data collected enables the comparison of species abundance and diversity along two protected sites.

57. Isolation and Characterization of Isolated Nematodes from Epinephelus morio species

Gabriella Fletcher, Alondra Tosado, Emilie Hickey, Myranda Ortega, Emily Durkin

The objective of this study was to identify which nematode species most commonly infects Epinephelus morio, commonly referred to as the Red Grouper. Sixteen total nematode isolates were collected from the body cavities of Red Grouper fish through necroscopy. The sixteen worms were each given a number 1-16 and individually put through a series of different experimental procedures to characterize the different species. Once collected the nematodes were visualized and imaged using both a dissecting and compound microscope to observationally identify the species and confirm they were all members of the Phylum Nematoda. Once microscopically observed, the DNA was extracted from the worms to amplify it with four different primers. The unknown isolates with the microscope were all confirmed to be Nematodes.

58. Molecular Characterization of Ligia Isopods from Oman Uncover Cryptic Diversity

Sophia Demitrio, Carlos A. Santamaria

Cryptic diversity refers to instances when two or species are morphologically similar and cannot be reliably distinguished. Previous findings have shown cryptic diversity occurs in taxonomic groups that have poor dispersal capabilities, including for instance crustaceans in the order Isopoda. Of special interest are Ligia isopods, as cryptic diversity has been reported in several Ligia species from around the world, including Hawai‘i, South Africa, and the Seychelles archipelago in the Indian Ocean. In some instances, these findings have led to descriptions of new species based on molecular data alone; while in others new species descriptions have relied solely on morphological data. For example, in the past 20 years three new species of Ligia have been described from the region between the Persian Gulf and the Red Sea: L. yemenica from the coastlines of Yemen, L. persica from the Persian Gulf, and L. dioscorides from Socotra Island in the Arabian Sea. To date; however, no studies have evaluated whether Ligia populations from Oman, which is located between Yemen and the Persian Gulf. In this study, we use molecular methods to characterize museum specimens collected from different regions in Oman. We seek to determine whether any Ligia populations from the region are molecularly distinct enough to be considered putative new species. Our findings suggest that Ligia populations from localities in the Gulf of Oman near the Persian Gulf are L. persica, while those found in the southern coastlines of Oman represent a unique genetic lineage that likely represents a new species.

59. Transcriptome Analysis of the Eastern Oyster (Crassostrea virginica) When Exposed to Extreme Salinities

Blake Busch, Luke Talham, John Ambrosio, Kimberly Dobrinski,

Oysters are a vital part of the Florida estuarine ecosystem and commercial fisheries industry. They protect estuarine environments by preventing erosion from storms and provide essential habitat and structure for other marine species. Oysters comprise the largest portion of the United States’ aquaculture production and they offer a way to address global food insecurity. Despite these benefits, the eastern oyster (Crassostrea virginica) faces multiple ecological and anthropogenic threats, including pollution, climate change, overharvesting, and salinity change, leading to an 85% decline in global oyster reef distribution. Few studies have used transcriptome sequencing to analyze variable gene expression and for pathway analysis in eastern oysters as a response to stressful salinities as an isolated variable. This project will utilize transcriptome sequencing to examine how

extreme low and high salinity events influence the expression of genes and alter pathways related to stress response in eastern oysters. We hypothesize that when eastern oysters are exposed to stressful salinity conditions, molecular pathways related to stress response, including the ER associated degradation pathway and the unfolded protein response pathway, will be upregulated. Further understanding of these pathways will provide insight into the eastern oyster's stress response system and help guide future work in oyster sustainability.

60. Feeding Biomechanics of Fish in the Everglades Ecosystem. Part 1: Invasive Species

Rory Caskey, Gabriella Di Nardo, Grace Magnacca, Isabel Knuteson, Maria Kershner-León, Daniel Huber

Everglades conservation is critical to both the survival of its biodiversity and the well-being of the communities surrounding this unique ecosystem. Factors such as the management of water resources, agriculture impacts, and invasive species all affect the viability of the Everglades ecosystem. Invasive species are the primary cause for the endangerment of 42% of the species listed under the Endangered Species Act and cost the United States economy $120 billion annually. The success of invasive species, such as cichlid fishes in the Everglades, can often be attributed to their ability to outcompete the native species in their niches. To investigate the success of cichlid fishes in the Everglades and their ecological impact on native centrarchid fishes, bite force and suction pressure were investigated over ontogeny using biomechanical modeling. Mayan cichlids (14 - 29 cm TL) had a biting mechanical advantage of 0.36 and bite force of 5.3 N and a suction mechanical advantage of 0.24 and suction pressure of 1.9 kPa. Nile tilapia (12 - 26 cm TL) had a biting mechanical advantage of 0.41 and bite force of 2.0 N and a suction mechanical advantage of 0.19 and suction pressure of 0.9 kPa. Future analyses will include additional sampling of these and other cichlid species as well as biomechanical modeling of native centrarchid fishes.

61. Automated detection of fish kill species distribution and abundance from drone imagery

Megan Datz, Edna Fernández-Figueroa

Large fish kills often occur during natural disasters and large algal blooms. Carcass enumeration and identification are necessary to determine the ecological and economic impacts of fish kill events but can be very time-consuming. Unoccupied aerial systems (UASs, or drones) provide large-scale monitoring of fish-kill areas at high resolutions, while deep learning tools available through ArcGIS Pro can be used to automatically identify and enumerate dead organisms. While these tools are a user-friendly, efficient way to quickly collect data during large fish kills, they are still in the developmental stage. The goal of this project is to test the combined use of UAS imagery and Deep Learning tools in ArcGIS Pro for carcass enumeration. We collected aerial imagery from 7 UAS flights, generated orthomosaics on Pix4Dmapper, and tagged carcasses based on 5 categories (i.e., regular, sportfish, eels, frogfish, trash) in Label Studio. The tagged images were used to train a Deep Learning Model in ArcGIS Pro. Future steps include testing the accuracy of the model and collecting more fish kill imagery to continue improving model performance.

62. Quality Improvement Evaluation in Hogar Abrazo de Amor

Karina Restrepo, Shanda Vereen

Hogar Abrazo de Amor is a facility that strives to provide essential care and services to at-risk adolescent girls in Puerto Rico. This project presents a comprehensive evaluation aimed at assessing program quality and effectiveness. The data was previously collected as part of an internship aimed to identify strengths and opportunities for improvement to better support residents' well-being and development, focusing on preparing them for independent life. This project engaged 19 former and current residents through 30-minute telephone and in-person interviews to gather feedback on the facility’s programs and services. Thematic analysis was utilized to identify recurring patterns and insights that emerged during the interviews. Analyses revealed the institution's commitment to quality care and the positive impact that the programs have on residents' overall well-being. Areas for improvement included the need for personalized approaches to services and improved communication with select staff and leadership. Recommendations resulting from this project focused on preparing residents for independent life through targeted education and counseling; providing valuable insights for ongoing quality improvement, supporting the institution's mission of empowering residents and fostering a supportive environment. Continued collaboration between staff, residents, and stakeholders is crucial for

recommendation implementation and ensuring successful resident transitions to independent living.

63. The Diet of Invasive Jack Dempsey Cichlids (Rocio octofasciata) in Tampa, Florida

Ethan B. Burka, Mark G. McRae

Jack Dempsey cichlids (Rocio octofasciata) are a freshwater fish native to Southern Mexico through Honduras. Recently found in the Tampa Bay area, their potential impact is unknown due to their ill-understood invasion ecology. In order to help determine the impact that these invasive cichlids may have on their novel environments, we analyzed the stomach contents of 53 Jack Dempseys that were captured in ponds in Wolf Branch Nature Preserve, 20 miles from downtown Tampa. We attempted to test two hypotheses: that Jack Dempsey's are eating an omnivorous diet and that as they grow larger, they will be more likely to consume vertebrate prey items. We failed to reject the first hypothesis, as arthropods were found to be the largest part of the fish's diet, and plant matter was found in nearly 50% of the fish's stomachs. The second hypothesis was rejected as actinopterygian scales were the only vertebrate prey sources found, and there was no relationship between size and scale consumption. These results indicate a degree of potential dietary overlap with invertebrate-eating native species, such as centrarchids.

64. Beyond the Surface: A Dive into the Chemical Components of the Hillsborough River

Theodore Fenske, Riley Garrison, Sarah Kelley, Maryn Shilale, Heather Mason

The Tampa Bay area is known for its recreational water activities ranging from marine to freshwater. Population surrounding the Tampa Bay estuarine system has historically increased nutrient levels through increased development and runoff. This study examines the variability in water quality along the Hillsborough River at four popular recreation locations. Temperature, pH, and dissolved oxygen measurements were replicated five times at each location along with a water sample for further testing of phosphates, nitrites, nitrates, turbidity, presence of hydrocarbons, and a suite of heavy metals. Of the metals tested, zinc was the only one that returned measurable levels. Analysis revealed that zinc increased in locations with increasing salinity. Phosphate levels were different between sampling locations, with the highest recorded value at 0.61 ppm. Phosphates are considered a limiting nutrient in aquatic systems and high levels of phosphates can have negative consequences including causing harmful algal blooms. Continuous monitoring of

nutrients and environmental contaminants is important for the health and safety of the ecosystems and the people that use them.

65. Carbazoles as Photoreductants in the Arylation of N-Methylpyrrole in the Presence of Air

Acadia C. Cooke, Ashley R. Longstreet

Carbazoles exhibit unique photophysical and electrochemical properties that allow them to act as single-electron photoreductants even in the presence of air. Previously, our research group synthesized and characterized eight carbazole derivatives and demonstrated their potential as photoreductants in the dehalogenation of aryl chlorides and bromides. Along with this, three of the eight derivatives were successfully employed as photocatalysts in the arylation of N-methylpyrrole with 2-chlorobenzonitrile. We have improved this methodology by demonstrating this reaction's ability to successfully perform in the presence of air. Further experimentation is being conducted to expand the substrate scope to the arylation of another five-membered ring, thiophene.

66. Behavior of Florida Crown Conchs (Melongena corona) in Response to Changes in Light Intensity

Autumn Bockmiller, Gabriella Bolinger, Bridget Homan, Lauryn Pedigo, Heather Mason

The goal of this study was to observe how changes in light intensity affected the overall behavior of the Florida Crown conch species, Melongena corona. Four saltwater tanks were set up, each starting out with five M. corona and differing light intensity (348, 315, 144, and 41 umol quanta m-2 s-1). M. corona behaviors were then observed from 7:45 to 8:15 in the morning and 7:45 to 8:00 at night over the course of ten days. Certain actions, like exposure to air, burrowing, intraspecies interactions, and active time were noted. With these behaviors in mind, statistical analyses showed that varying light intensities caused a significant difference in the number of M. corona that bury themselves in the sediment, and the number that remain above the water. There, however, was no significance in the active time of M. corona, except for the high and low light intensity tanks at night. These findings imply that higher light intensities cause M. corona to spend more time buried and that certain light intensities encourage M. corona to stay out of the water. With this, one can get a better idea on the response of M. corona to the changing tides.

67. 1,2-Azidooxygenation and 1,2-Diazidation of 1,3-Dienes

Adriana E. Barni, Megan A. George, Brett N. Hemric

Azide (N3) groups represent a valuable synthon within synthetic organic chemistry, due to their ability to be rapidly diversified into a range of valuable functional groups such as amines, 1,2,3-triazoles, and phosphoramides. These functional groups span a wide range of applications from pharmaceutical building blocks to biorthogonal probes. This proposal details the development of reactions that provide rapid incorporation of azides onto 1,3-dienes through the use of a highly-reactive iodine(III) reagent.

68. Studies on the 1,2-Difunctionalization of 1,3-Dienes Using Iodine(III) Reagents

Jacob R. Pangborn, Brett N. Hemric

The pursuit of novel reactivity relies on the development of reactive species for synergistic reactivity with an extensive range of reactive partners. Towards this end, iodine(III) (iodoxolone) reagents have seen increased interest due to their high reactivity and versatile range of functional group derivatives. In light of recent success using the azide derivative of these reagents (Zhdankin reagent) for azidation of 1,3-dienes, this proposal provides an extensive study of other iodine(III) reagents and their reactivity towards various olefins such as alkenes and 1,3-dienes.

69. Analysis of Toxin Producing Bacteria Isolated from Kombucha

J. Conor Deneault, Lauren Logsdon

Toxins are ubiquitous in nature; many taxa have at least one organism that produces a compound that kills or otherwise inhibits the activity of another organism. Toxins produced by fungi and bacteria play a substantial role in our modern lives; fungal and actinomycete bacteria toxins are best known for their antibiotic capabilities, as it is from those two clades that the best-known antibiotics are derived. Toxins of other bacterial phyla are most studied for their potential use in the pathology of the bacterium. Meanwhile, the ecology of bacterial toxin use is an area of study underrepresented in the literature. This study seeks to develop our knowledge of the toxins bacteria use to compete with their neighbors. To achieve this goal, bacteria were isolated from kombucha tea and co-cultured with each other to determine if they inhibit the growth of another bacterial colony. Three bacterial colonies that inhibit the growth of other colonies were identified and sequenced using 16s rRNA. The three isolates were screened using PCR for the presence of the gene encoding

for the PF04740 family toxin YwqJA. Further studies will characterize the toxin-antitoxin pairing for YwqJA.

70. Pickle Pals: the Isolation and Characterization of Bacteria in Fermented Pickles

Nicole Chaves, Lauren Logsdon

Fermented food products are commonly known for the beneficial bacteria they possess. Pickles were selected as a commonly consumed fermented food product to identify microorganisms present to see if any beneficial bacteria are present and how they may interact with other bacteria. Bacteria were isolated from refrigerated Bubbies Fermented Pickles pickle juice by doing serial dilutions and spread plating to isolate bacterial colonies. A gram stain was then done to identify whether the microbes grown were gram positive, gram negative, or yeasts. This identification was then used to determine which of the collected bacteria were unique isolates. As a result, nine unique isolates were identified. Identification of the unique isolates is being conducted with 16srRNA sequencing. Bacteria from room temperature pickle juice of the same container are also currently undergoing characterization to identify any differences in the bacteria present when compared to the bacteria which grew in the refrigerated juice. All the bacteria collected from this experiment will be kept for a future experiment to compare to bacteria found in other fermented food products like miso soup and cheese to see how they all grow when in competition with each other.

71. How water quality changes with distance from an Eastern Oyster, Crassostrea virginica, population

Jordan Davis, Claude Lee, Emily Ollendorff, Julia Piper, Samantha Schlegel

Tampa Bay has many filter feeders, such the Eastern Oyster, Crassostrea virginica, that improve water quality via water filtration. This study investigated the impact of C. virginica on nitrite, phosphate, and chlorophyll (a) water concentrations by collecting water samples at three distances (0 m, 3 m, 6 m) from a dock oyster population. Chlorophyll (a) levels reflect phytoplankton populations, a major oyster food source. Seven quadrats were used along the dock to understand the filter feeder community structure. Oysters were the main filter feeder, but other filter feeders were present: solitary ascidians, barnacles, compound ascidians, green mussels, purple and orange sponges. Oysters showed the largest mean percent cover (82.14 %) followed by barnacles and compound ascidians, 73.3% and 52.5%, respectively. Chlorophyll (a) was significantly higher at 6 m compared to 0 m.

Chlorophyll (a) may have been highest furthest from the oyster bed because of less water filtration. For nitrite levels, it is probable our water samples were affected by influx of external nutrients through seabird feces. For this reason, additional sampling is necessary at oyster beds with reduced seabird activity to accurately understand the relationship between the distance from an oyster bed and changes in water chemistry.

72. Microbial Mouthpieces: Investigation of a Microbial Isolate on Dental Retainers

Sebastian Giarratana, Haydn Rubelmann

The human oral cavity harbors a diverse microbial ecosystem and is linked to the pathology of dental and periodontal diseases. While studies have implicated specific bacteria like Porphyromonas gingivalis and Streptococcus mutans in oral pathogenesis, the microbial composition of orthodontic retainers remains relatively unexplored. This research aimed to investigate the microbial community on dental retainers and elucidate potential risks associated with their use. Contrary to expectations, Pseudomonas aeruginosa emerged as the predominant isolate from a sampled retainer, exhibiting resistance to multiple antibiotics. Microscopic, biochemical, and genetic analyses confirmed its identity, highlighting its clinical significance and challenges in infection control and pathogenesis of diseases. This unexpected finding holds significance in infection prevention strategies in orthodontic practice.

73. Studies Toward Alkynylation of Olefins

Jeremy M. Williamson, Brett N. Hemric

Alkynes are a versatile functional group present in a wide variety of synthetic applications from materials to pharmaceuticals. This proposal explores a variety of approaches and results for adding alkynes in an electrophilic fashion to olefins, such as alkenes and 1,3-dienes.

74. Oyster Size Comparisons Between Intertidal and Submerged Zones

Madison Combs, Maggie Nestor, Adrianna Ludwig, Lydia Schwarz

The intertidal habitat is a harsh marine environment consistent with various bivalve species. In this significant research, the oyster population of Tampa Bay was observed to analyze how two different zonations, fully submerged and tidally influenced, can affect bivalve composition. Ten oysters were collected at each zone to compare the body morphology from a grid scaling. Each oyster measured its entire body size in millimeters. The original thesis of the research was to compare the high and low tide population to the full submerged population. However, due to unforeseeable weather and visibility conditions only the low tide populations were measured. A non-parametric analysis was used to investigate differences in size between the two populations. Oyster body size when fully submerged zone was larger than the body sizes of oyster under the tidal influence. The analysis of the research revealed a connection to how intertidal species can alter their biological and mechanical processes to increase their survival rate under the stresses of environment conditions.

75. Variation in Seahorse Coloration Patterns between Caves and Quarry sites at Sweetings Pond

Emily Rae Kearney, Adriana Banuelos, Chania Aubourg, Dr. Heather Mason

Sweetings Pond is an anchialine tidal pond located in Eleuthera, The Bahamas, that houses organisms with very particular characteristics. This present study examined the differences in color and patterns of Hippocampus Erectus (N=699) by measuring their mean and standard deviation of grey pixels obtained from ImageJ software and manipulating these variables based on their sex, location, and season using JMP software. The mean grey pixel value was indicative of how lightly or darkly colored the seahorses correlating color to the background coloration of the habitat. The standard deviation value was indicative of how evenly colored the seahorses were. There were significant differences in seahorse coloration for all treatments tested, female seahorses were brighter and showed significant variation in coloration. Dry-season seahorses had a darker coloration in comparison to wet-season seahorses. There was no significant relationship between sex and season in the seahorses' mean or standard deviation grey pixels, therefore the null hypothesis was accepted. Studying animal coloration, specifically seahorses in this context, is important because it allows a baseline to be established for animal coloration and what can be expected based on the season, sex, location, age, etc. of the animal.

76. Comparing Quantities Consumed by Crassostrea virginica in Intertidal and Subtidal Zones

Gillian Silvay, Shannon Byrne, Heather Mason

The eastern oyster Crassostrea virginica is an important organism to intertidal regions in the eastern United States. The oyster's ability to filter water through their feeding mechanism has been a larger benefit of oyster reef habitats. Due to living in a unique intertidal habitat, the animals can experience life fully or partially submerged underwater. We presumed that the intertidal oysters would have an adaptational advantage over the subtidal oysters due to the stressful nature of the intertidal wall. By isolating specimens from the intertidal and subtidal zones in a controlled area, we noted the amount of food eaten on a per mass basis for each group. This was done over 2 weeks, with two different feedings. Each feeding included measuring the initial average particles in 0.5g of Aquatic food (Golden pearls 5-50 microns) and the final average particles eaten after about 3 days. We then found the tissue body mass of each oyster to calculate particles per microliter eaten per gram of body tissue. The oysters in each region ate the same amount of food. The advantage between the groups is not that the intertidal oysters are better at feeding but rather the submerged ones have more opportunities for food.

77. Differences in Biodiversity Between Protected and Unprotected sites of Tampa Bay

Blake Busch, Forest Dotterer, Jordan Haas, Shelby Hagler, Trenton Norberg

Mangrove forests in Tampa Bay play a crucial role in supporting fish biodiversity due to their unique ecological characteristics. These habitats serve as nurseries, breeding grounds, and shelters for a diverse range of fish species. The biodiversity of mangrove ecosystems in Tampa Bay can be variable depending on whether the environment is protected or unprotected from boating traffic. We utilized Baited Remote Underwater Video Stations (BRUVS) to observe the differences in biodiversity between these sites. Between the protected and unprotected sample locations, there was no significant difference in both maxN and the total number of species. These results challenge the concept that heightened habitat protection fosters biodiversity and ecosystem functionality. The investigation underscores the importance of conservation actions in preserving and enriching biodiversity within mangrove ecosystems, further informing management strategies for these vital coastal habitats. Our findings emphasize the need for continued research to better understand the mangrove ecosystem and the benefits it brings to the environment.

78. From Your Cup to Your Gut: Comparison of Organisms Found in GT Synergy Kombucha and Kevita Probiotic Sparkling Refresher Drink

Maryn Shilale, Lauren Logsdon

Probiotics are non-pathogenic microbes that provide many human health benefits once they have entered and replicated within our gut. These bacteria and yeast are found in various beverages, supplements, and foods. The benefits exhibited by probiotics stem from their ability to produce antioxidants and antimicrobial substances and improve gastrointestinal function by promoting the growth of normal flora and inhibiting the growth of disease-causing organisms. This project is collecting and characterizing organisms found in commercially sold probiotic products to investigate their interactions with each other and human pathogens. Kevita Probiotic Sparkling Refresher Drink was sampled to quantify and characterize the “bugs” present. Bacterial colonies were isolated and characterized by colony morphology. Gram staining and Mannitol Salt Agar selective plating categorized the unique isolates. The 15 unique isolates identified were dominated by gram positive, bacilli bugs. A total of 9 colony morphologies were observed, ranging in color from opaque/white to yellow. These results are quite similar to sampling of GT Synergy Kombucha which was also dominated by gram positive bugs, though with a mix of bacillus and cocci individuals. Future experiments will test the effect these probiotics have on Streptococcus pyogenes, a common cause of both mild diseases and severe infections.

79. Sea Urchins as Indicators of Seasonal Environmental Stressors and Variation

Lydia Francis, Alana Acevedo, Abigail Kirkpatrick, Abigail Wilson, Michelle Roux-Osovitz

Lytechinus variegatus dwells in the sea grass and unvegetated benthos surrounding Tampa Bay. Seasonal fluctuations in this region include nutrients and sea grass density. These fluctuations can introduce stress into the urchins’ habitat, potentially affecting the health and reproductive potential of the population. Urchins serve an important ecological role in the benthos, contributing significantly to the food web via nutrient recycling and promotion of growth through grazing in protected sea grass beds. The study presented here aims to test if L. variegatus can be used as an indicator species for the health of Tampa Bay benthic habitats and the reproductive success of the residing urchin populations during seasonal fluctuations. To do this, we took advantage of the well-studied immune coelomocyte population of the urchins to assess responses to seasonal stressors at two distinct ecological sites in Tampa Bay. Urchins were sampled weekly over 3 months (June-July-August) and diversity within the coelomocyte populations was determined by morphology (vibratile, red amebocytes, white amebocytes and phagocytes) and compared to

echinochrome-A levels, gonadal/somatic index and egesta contents. We applied ANOVAs and T tests to assess the relationship between environmental fluctuation and innate immune response as a means to predict reproductive success and health of the urchin populations.

80. Seasonal effects on species abundance in seagrass beds of Tampa Bay

Serena Gakhal, Willow Kessel, Olivia Stelletell, Taylor Trimper

Species abundance and diversity analysis was conducted on a seagrass bed in Tampa Bay, Florida, specifically a site along a busy channel over the 2023 wet and 2024 dry season. Among seagrass species Thalassia testudinum, Syringodium filiforme, and Halodule wrightii, the most abundant wet season species found included Tozeuma carolinense, Palaemonetes paludosus, and Farfantepenaeus duorarum. During the dry season, the most abundant species found included Tozeuma carolinense, tube worm species, and hermit crab species. Overall, the 2023 wet season presented a more diverse species assemblage in terms of abundance compared to the 2024 dry season. There was a significant difference between blade count and percent coverage of seagrasses for each season, as the wet season had more coverage and a higher density. This data presented a positive correlation between seagrass density and species abundance by season. The analyzed channel was in a highly disturbed area with wave action and human activity. If a protected seagrass bed with less disturbances was analyzed, there most likely would have been increased seagrass and ecosystem density. The seagrasses may have been able to flourish, allowing organisms that rely on seagrass as their habitat to have a more stable and desirable ecosystem.

81. Morphometrics and Behavior of Hippocampus erectus in Sweetings Pond habitat

Ethan Andersen, Johanna Hartman Coelho, Josephine Hoffman, Mattie Miller, Ashley O’Brien, Casey Racho

Lined Seahorses (Hippocampus erectus) are an important indicator species of ecosystem health. In previous research, there has been a correlation in the loss of diversity within the habitat. Through measurement and statistical analysis of the tail length of male and female seahorses at Sweetings Pond from 2018 to 2019, it was concluded that there is measurable sexual dimorphism within this species. Measurements of tail length and identification of holdfast were taken from images on site. On average, males have longer tails than females. The distribution of holdfast types that individuals were found on during the day is

concentrated on sediment, followed by algae and bivalves. Conversely, the distribution of holdfast types that individuals were found on at night were distributed evenly among corals, algae, and sediment. This distribution shows that H. erectus is stationary to avoid predation during the day and engage in mating and feeding behaviors at night. These findings regarding nocturnal behavior in H. erectus are consistent with previous studies in Sweetings Pond, although nocturnal behavior should not be generalized for the global population of H.erectus.This shows how biologically significant the Sweetings pond is in determining H. erectus behavior.

82. Modifying Baited Remote Underwater Video Systems to asses length measurements of fish in Tampa Bay

Cory Ryder, Zach Hilliker, Jake Heabel, Conor Milligan, Heather Mason

Baited Remote Underwater Video Systems (BRUVs) provide ecological benefits and data collection ease by implementing a nonintrusive method of habitat assessment. Traditional techniques may cause damage or incomplete data due to human disruption. Overtime, BRUV units have been fitted with attachments that aid in increased data collection per deployment. The focus of this study aimed to create and experiment with a method in which fish length could be analyzed from the captured video. By utilizing a BRUV system with an attached T-Bar apparatus an assessment of length of species was studied. By setting a scaled length measurement on the T-Bar in conjunction with the measuring software Image J, a length assessment based on species and habitat type was collected. From a fisheries aspect, it is important to understand the behavior of specific fish species and which habitats each age group may utilize most frequently. Once a length is collected it can be correlated with an estimated age of the fish and then assessed by which habitat the species data was collected in. By increasing the understanding of what length and age specific fish species utilize most frequently, behavioral patterns may be more accurately assessed.

83. Modifications to Baited Remote Underwater Video Systems (BRUVs) to allow for increased ecological data collection in Tampa Bay

Cory Ryder, Latyr McQuarters, Heather Mason

Standard marine organism methods of gathering data involve observation through dive surveys or direct capture, requiring expensive man hours or environmentally damaging practices like trawling. BRUVs are a minimally invasive practice that has a low entry-level cost and a wide range of applications that allow it to be used in almost any area with acceptable visibility levels. The focus of this study aimed to create and experiment with a method in which fish length could be analyzed from captured video, therefore increasing the amount of ecological data collected per deployment. By utilizing a BRUV system with an attached T-Bar apparatus and a set scale measurement, an assessment of length of species was studied via Image J software and a correction curve was created during the study to increase viability of the measurements. An additional attachment that was implemented was the addition of lures to the T-Bar. The addition of the T-Bar allowed a mounting surface for three styles of lure that lie in plane of the camera frame and were assessed for increased and direct interactions with the units.

84. Leukemia insidence rate and water consumption

Melanie Varón Golden

Leukemia is a cancer of blood-forming tissue that is characterized by the rapid production of abnormal white blood cells(leukocytes) that accumulate in the bone marrow and interfere with the production of normal blood cells. The importance of this research is to show the environmental factors that contribute to the increase in leukemia incident rates. Previous studies have shown a link between THM exposure through water consumption and leukemia incident rate. This study investigates the association between leukemia incidence and water quality, particularly focusing on the levels of trihalomethanes (THMs) across different counties in Florida. Therefore, analyzing THM levels in water sources across different counties becomes imperative for the public health initiatives aimed to reduce the mortality incidence rate. In this study, the connection between THM levels and leukemia incidence is investigated using statistical methods. Additionally, this study will investigate the contribution of income level to leukemia incidence. In conclusion, water quality and income will be examined to see if the incidence leukemia rate shows the importance of water THM consumption levels and the effect of cancer rates.

85. What's in Your Unpasteurized Brie Cheese?

Dr. Lauren Logsdon

In order to identify the microbes present in unpasteurized Brie cheese, the collection of these microbes is necessary. This will eventually lead to the discovery of if these bacteria are successful in protecting against harmful bacteria. The cheese and the rind were separated and serial dilutions of both were plated onto MRS and BHI plates to measure bacterial growth. Different bacterial colony morphologies were identified and counted. In addition, patch plating was done of both the cheese and rind colony morphologies to further characterize species. After the patch plates had grown, they were replated onto MSA plates to determine If the bacteria would grow in a salt environment. Bacteria were further characterized by gram staining to determine the cell size, shape, and arrangement. There are various morphologies present in the rind and cheese, with bacteria identified as cocci or bacilli, but gram (+) cocci being the most prevalent. The next step in the research process is to send the samples out for DNA sequencing of the 16srRNA gene to genetically identify what organisms are present.

86. Chilomycterus schoepfi Distribution and Diet Prevalence in Varying Seagrass Meadows in the Tampa Bay Region

Lily Brock, Jessica Mitchell, Delea Ruggeiro, Chase Taylor and Juliette Valley

This study was conducted in Tampa Bay to determine if a correlation existed between the species of seagrass and the prevalence of striped burrfish, Chilomycterus schoepfi. Striped Burrfish feed on various types of gastropods, which are important components in the seagrass food chain. Considering that seagrass environments are on continuous decline in Tampa Bay, it is important to understand the relationship between fish populations and seagrass beds. By predating on gastropods, the striped burrfish is vital for the well-being of seagrass populations. Initially, it was hypothesized that locations containing various seagrass species will show a difference in the number of striped burrfish present. Four environments were tested including Thalassia testudinum, Syringodium filiforme, T. testidinum and S. filiforme mix, and sand (control). The experiment was performed by completing four-meter-long net pulls at four different locations along a 30-meter transect in each environment. Once analyzing the data, it was found that the seagrass type did not have an influence on the presence of striped burrfish; however, there was variation in burrfish diet prevalence. It was found that there was an increase in gastropods in T. testudinum covered environments compared to the other variables.

87. Maximal Metabolic Rate of Pinfish vs. Mojarras

Luke Bishop, Jessica Jilek,Philip Iozzi, Shenae‘ Reid, Jeffrey Grim

This study sought to observe the maximal metabolic rate (MMR) of two fish species within Class Osteichthyes: Lagodon rhomboides (pinfish) and Eucinostomus harengulus (tidewater mojarra). The fish were collected at Davis Island, Tampa using sabiki rigs and cut shrimp. 10 pinfish and 10 mojarra were collected (n=20). We predicted that pinfish would have the highest MMR after induced-stress. Data analysis did not support the hypothesis due to the discovery of minimal differences in MMR between the two species. These results could be utilized in the decision between the species you want surviving the longest on the end of a fishing line.

88. What’s in Your Miso? The Biological Diversity of the Probiotic Miso

Gavin Cooper, Lauren Logsdon

Probiotic foods or beverages are claimed to contain non-pathogenic microorganisms such as bacteria or yeast, which contain antioxidant and antimicrobial substances to boost the immune system and to improve gut health. Over the last year, the Logsdon Lab at the University of Tampa sought to investigate the species of bacteria or other microorganisms isolated from probiotic foods and beverages. This project was called, “What’s in Your Drink: Diversity of Organisms found in Probiotic Beverages”, which looks at fermented foods such as yogurt, kimchi, kombucha, sauerkraut, and a variety of probiotic supplements. The lab intends to build a collection of microorganism isolates and ultimately run competition assays to investigate interactions with other isolates and normal flora (“good bugs”), focusing on Streptococcus pyogenes. This experiment investigates the microorganisms in Miso, a fermented paste derived from soybeans and often used in Japanese cuisine. Bacterial colonies were grown and isolated on either MRS or BHI agar. Isolates were examined for specific shape and morphology through gram staining and imaging. Several bacilli and cocci morphologies were found, along with both gram+ and gram- bacteria. Species identification will be done in the near future using PCR (Polymerase Chain Reaction) and sequencing of the 16srRNA gene.

89. Affect of Temperature on Respiration rate of Iridescent Swimming Crabs

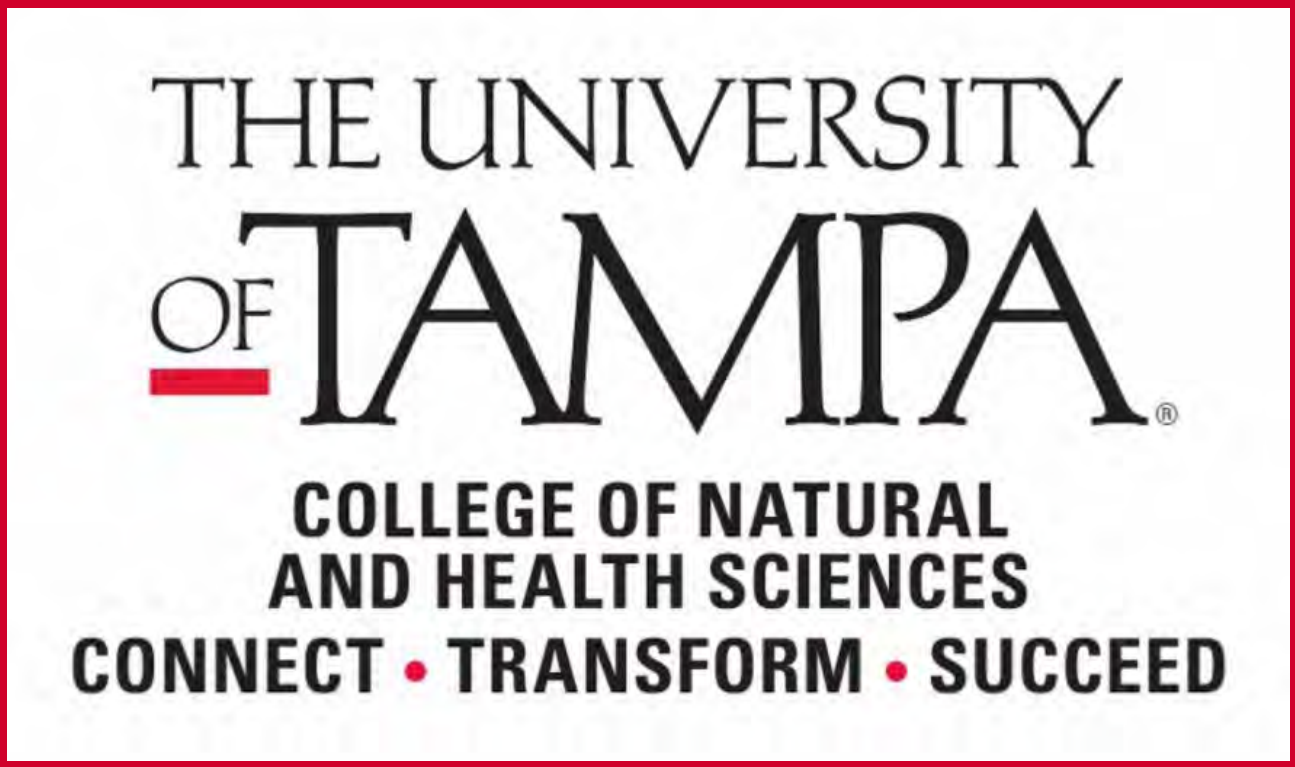
Taylor Lacava, Dr. Jeffrey Grim, Olivia Lex, Chadwick Pezza, Skyeler McDaniel

Iridescent swimming crabs are commonly found in Florida and the Gulf of Mexico and can thrive in a habitat ranging from 22-28 ° C. A question poseable to this set of conditions is how does the water temperature affect the metabolic rate of the crabs? Using oxygen sensor probes, data was collected from six different crabs in order to determine the dissolved oxygen in the water at two different temperatures; 22.7 ° C and 28.6 ° C. It was found that the crabs in the warmer temperature group (28.6 ° C) had a higher metabolic rate, supporting our initial hypothesis that rates would increase with increasing temperatures.

90. BRUV Analysis of Bridge Sites in Upper and Lower Tampa Bay

Latyr McQuarters, Caymen Magill, Alyssa Murphy, Lex Levin, Emma Robbins, Heather Mason

Baited Remote Underwater Video (BRUV) is an easy-to-use, relatively inexpensive, and nonintrusive method to gather information in marine environments. Our BRUVs consist of a GoPro mounted on a PVC frame with an arm extending a bait bag, a T-bar, and in some cases lures. This research method has been extensively practiced by the University of Tampa's Marine Ecology lab to further understand the ecology of Tampa Bay. In this project, BRUV data was used to compare the species diversity, richness, and amount of activity between two bridges in upper (Gandy) and lower (Skyway) Tampa Bay. Due to inclement weather, Gandy Bridge showed very poor visibility, contributing to fewer organisms being observed. Data gathered from Skyway Bridge, on the other hand, yielded many species including game fish and large schools of bait fish. Data analysis concluded that there are significant differences in the number of species, individual organisms, and the total amount of activity seen in each video between the two sites. The results we gathered this semester may also be compared to data gathered on the same subject during a previous semester, meaning this data as well as BRUV data overall can be replicated to compare seasonal variability.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