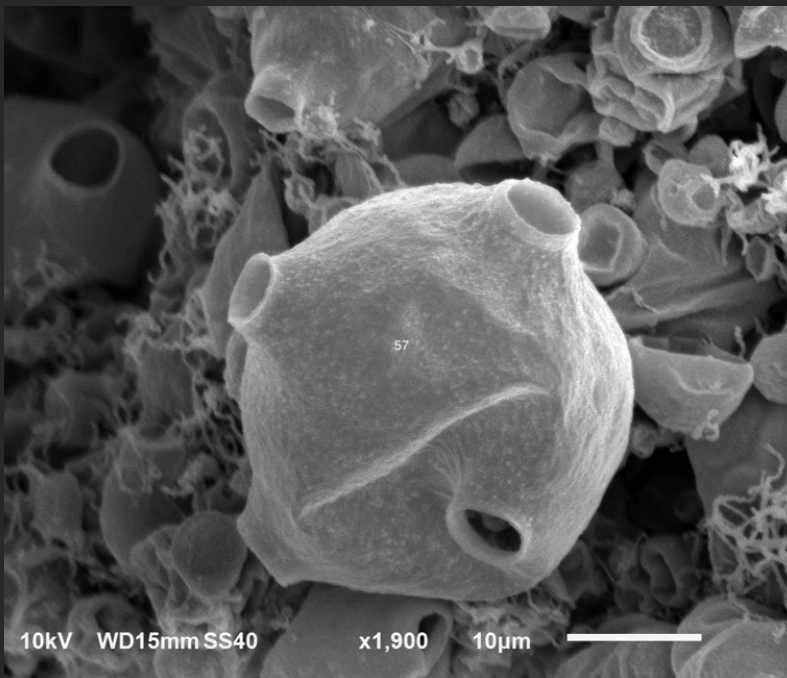




THE 7TH ANNUAL

CNIHS UNDERGRADUATE research SYMPOSIUM

MAY 3, 2019



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Schedule

2:00 - 3:00 p.m.	Keynote Speaker
3:00 - 3:55 p.m.	Poster Session I
4:05 - 5:00 p.m.	Poster Session II

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

Symposium Organizers: Dr. Eric Freundt, Dr. Simon Schuler, Olivia Crimbly, and Devon Grey.

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, an Honors Research Fellowship, or an independent project conducted with a faculty mentor. Abstracts for all poster presentations are included in this booklet and are listed in alphabetical order based on the presenting author's last name.

The Symposium was initiated in 2013 through a generous grant from the UT Board of Fellows. Further financial support from the Office of the Dean of CNHS, the Department of Biology and Department of Chemistry, Biochemistry and Physics 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

Florida Red Tide: What's new, what's true, and what you should know.



Dr. Cynthia Heil

Director, Red Tide Institute

Mote Marine Laboratory

Poster Session I

* Denotes authors presenting at symposium

(1) Isolation of Marine Sediment-Derived Bacteria that Produce Biologically Active Metabolites

Gabriella Albert*¹ and Dr. Christine Theodore²

¹Department of Biology, The University of Tampa

²Department of Chemistry, Biochemistry, and Physics, The University of Tampa

(2) Effects of Ultraviolet Radiation on *Staphylococcus aureus* Biofilm Integrity: an ultrastructure analysis using Scanning Electron Microscopy

Gabriella Albert*¹

¹Department of Biology, The University of Tampa

(3) Higher Training Volume Does Not Optimize Strength Adaptations in Resistance Trained Men

Daniel Aube*¹, Joshua Bradshaw¹, and Dr. Eduardo O. De Souza¹

¹Department of Health Sciences and Human

Performance, The University of Tampa

(4) Image-Based Analysis of Male *Syngnathus scovelli* Fecundity by Season

Kristin Bashline*¹, Magaleate Kostelnik*¹, and Julia Skowronski*¹

¹Department of Biology, The University of Tampa

(5) Predictive habitats for invasive Asian Green Mussel in Tampa Bay (*Perna viridis*)

Kristin Bashline*¹, Dr. Bridgette Froeschke¹, and Dr. Michael Middlebrooks¹

¹Department of Biology, The University of Tampa

(6) The Effects of Varying Light Intensities on Dwarf Seahorse Behavior

Marie Bear*¹, Michelle Melilli*¹, and Maddie Mueller*¹

¹Department of Biology, The University of Tampa

(7) Chromatic Adaptation Theory

Patrick Boisvert*¹, Alex Rivera*¹, and Christian Shaffer*¹

¹Department of Biology, The University of Tampa

(8) Does Response of Weekly Strength Training Volume on Muscular Hypertrophic Adaptations in Trained Individuals

Joshua Bradshaw*¹, Daniel Aube¹, and Dr. Eduardo O. De Souza¹

¹Department of Health Sciences and Human

Performance, The University of Tampa

(9) Uncovering disordered proteins among copy number variants in *Danio rerio*

Anthony Brando*¹ and Dr. Kimberly Dobrinski¹

¹Department of Biology, The University of Tampa

(10) Tissue specific compensatory regulation of gene expression associated with copy number variants in *Danio rerio*

Sherrea Brown*¹ and Dr. Kimberly Dobrinski²

¹Department of Chemistry, Biochemistry, and Physics,

The University of Tampa

²Department of Biology, The University of Tampa

(11) Genetic Characterization of Introduced Populations of the African Jewelfish, *Hemichromis letourneuxi*, to the Waterways of Florida.

Elizabeth Burke*¹, Dr. Pam Schofield², and Dr. Natalia Belfiore¹

¹Department of Biology, The University of Tampa

²Wetland and Aquatic Research Center, U.S Geological Survey

(12) Strain comparison of *Batrachochytrium dendrobatidis*

Samantha Byrne*¹ and Dr. Taegan McMahon¹

¹Department of Biology, The University of Tampa

(13) The Effect of Flow Rates on Predation of *Donax variabilis* by *Luidia clathrata*

Rachel M. Cacace*¹, Sarah E. Detmering*¹, Gabrielle

M. Vaillancourt*¹, and Dr. Heather Masonjones¹

¹Department of Biology, The University of Tampa

(14) Identification of Intrinsically Disordered Proteins in Adenoviruses

Rachel Cacace*¹ and Dr. Padmanabhan Mahadevan¹

¹Department of Biology, The University of Tampa

- (15) **The Impact of Microplastics on *Crassostrea virginica* Filtration Efficiency**
 Jenna Carpenter*¹ and Brianna Sierra*¹
¹Department of Biology, The University of Tampa
- (16) **The Effect of Rising Temperature on Blue Crab, *Callinectes sapidus*, Metabolism: Physiological and Economic Implications Related to Climate Change**
 Sara Casareto*¹, Ashley Sabatino*¹, Marjola Deda*¹, and Griffin Baughn*¹
¹Department of Biology, The University of Tampa
- (17) **Growth Rate and Survival Rates of Juvenile *Elysia subornata* Sea Slugs Vary Depending on Diet**
¹Sara Casareto*¹ and Dr. Michael Middlebrooks¹
¹Department of Biology, The University of Tampa
- (18) **Mechanical Analysis**
 Vincent Clanzy II*¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa
- (19) **The Effect of Temperature & Salinity on the Metabolic Rate of *Perna viridis* and *Crassostrea virginica***
 Lina Claudio*¹, Sarah Noonan*¹, Eva Pagan*¹, and Hannah Strzelinski*¹
¹Department of Biology, The University of Tampa
- (20) **Habitat Preference of *Hippocampus zosterae* in Seagrass Beds Containing *Gracilaria tikvahiae***
 Allicyn Cole*¹, Hannah Smith*¹, and Claudia Kirby*¹
¹Department of Biology, The University of Tampa
- (21) **The Effects of Chemical and Biological Gold Nanoparticles on Human Dermal Fibroblasts**
 Samantha Courtney*¹, Dr. Pavan Rajanahalli¹, Dr. Sai Lata De², Dr. Sneha Krishnamurthy¹
¹Department of Biology, The University of Tampa
²Morsani College of Medicine, The University of South Florida
- (22) **Use of the Photoelectric Effect to Measure Planck's Constant**
 Kyle Creighton*¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa
- (23) **Construction of a Computational Phylogenetic Pipeline using Python**
 Patrick Davis*¹ and Dr. Padmanabhan Mahadevan¹
¹Department of Biology, The University of Tampa
- (24) **Parasite load of *Entomospodium mespili* on Indian hawthorn bushes (*Rhaphiolepis sp.*) may differ based on location and surface areas of leaves**
 Kamila De La Cruz*¹, Blake Roberts¹, Casey Walsh*¹, Nicole Arbelaez¹, and Dr. Taegan McMahon¹
¹Department of Biology, The University of Tampa
- (25) **The Effects of Bd Metabolites on Freshwater Invertebrates**
 Sarah E. Detmering*¹, Caitlin L. Nordheim¹, and Dr. Taegan A. McMahon¹
¹Department of Biology, The University of Tampa
- (26) **Testing for Antibiotic Resistance Among *Staphylococcus aureus* Species in Recreational Fisheries**
 Madison Dowdy*¹ and Dr. Bridgette Froeschke¹
¹Department of Biology, The University of Tampa
- (27) **A Quantitative Approach to Estimating Fishing Pressure on Important Recreational Fisheries within Tampa Bay**
 Madison Dowdy*¹ and Dr. Bridgette Froeschke¹
¹Department of Biology, The University of Tampa
- (28) **Cliques aren't just for Humans: Spatial Distribution of a Geographically Isolated Bahamian Population of the Lined Seahorse, *Hippocampus erectus***
 Jessica Elson*¹, Dr. Heather Masonjones¹, and Dr. Emily Rose¹
¹Department of Biology, The University of Tampa
- (29) **Don't Mind Me: Behavioral Reactions of the Dwarf Seahorse (*Hippocampus zosterae*) when Exposed to Chemical and Visual Predator Cues**
 Jessica Elson*¹ and Jared Aubin*¹
¹Department of Biology, The University of Tampa
- (30) **The Real Terrors of the Bay: *Enterococcus* and Fecal Coliform levels in Tampa Bay over a twenty-year period**
 Jessica Elson*¹ and Emily Maness*¹
¹Department of Biology, The University of Tampa
- (31) **Effect of Salinity on Cercarial Shedding Rate of *P. trivolvis***
 Ariana Ferraro*¹, John DelGiudice¹, Amanda Porto¹, and Dr. Taegan McMahon¹
¹Department of Biology, The University of Tampa

- (32) **Climate Change Effects on Gray Sea Stars (*Luidia clathrata*)**
Lindsey Foster*¹, Hailey Mitchell¹, Madeline Davidoff¹, and Victoria Fagg*¹
¹Department of Biology, The University of Tampa
- (33) **Determine the Effect Diet Has on Asexual Growth of *Rhodactis* sp. and the Concentration of Zooxanthellae (*Symbiodinium*)**
Keri Fox*¹ and Michael Hood*¹
¹Department of Biology, The University of Tampa
- (34) **Internal and External Parasite Load of Bess Beetle (*Odontotaenius disjunctus*)**
Emma Fraser*¹, Haley Lasco*¹, Taylor Smith¹, and Dr. Taegan McMahon¹
¹Department of Biology, The University of Tampa
- (35) **SN1 alkylation of 1,3-dicarbonyl compounds in aqueous reaction mixtures**
Tamir Galili*¹ and Dr. Eric Ballard¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa
- (36) **Environmental DNA: a Tool for Quantifying Cryptic Fishes within Tampa Bay**
Matthew H. Gamache*¹, Dr. Emily Rose¹, and Dr. Sean Hitchman¹
¹Department of Biology, The University of Tampa
- (37) **The Effects of Water Quality and Sediment Grain Size on the Presence of *Emerita talpoida* at High (Clearwater Beach, FL) and Low (Indian Rocks Beach, FL) Human Impact Beaches**
Rebecca Garcia*¹ and Cayman Riley*¹
¹Department of Biology, The University of Tampa
- (38) **Vaccination as a Technique to Induce Acquired Resistance in *Pseudacris regilla* to *Batrachochytrium dendrobatidis***
Alexis Garcia*¹, Sarah Detmering¹, Caitlin Nordheim¹, and Dr. Taegan McMahon¹
¹Department of Biology, The University of Tampa
- (39) **The Effect of Human Traffic on Fecal Coliform Concentrations at Weeki Wachee, Homosassa, and Ulele Springs**
Paige Glaser*¹
¹Department of Biology, The University of Tampa
- (40) **Mutation Induced by the Mutagen EMS in Sxl, Sex lethal, Causes Temperature Sensitive Female Sterility in the *Drosophila melanogaster* Mutant fs(1)K741.**
Jillian Gomez*¹, Myles Hammond¹, Leif Benner, MS², Stephen Kucera, Ph.D¹
¹Department of Biology, The University of Tampa
²Department of Biology, Johns Hopkins University
- (41) **Epidemiology of Myasthenia Gravis Represented in the Life Course of Individuals and the Factors that Impact the Quality of Life of these Patients**
Kendyl Grant*¹ and Dr. Claudia Aguado-Loi¹
¹Department of Health Sciences and Human Performance, The University of Tampa
- (42) **A Comparison of Measles Outbreaks Pre and Post Generation of Vaccines**
Kimberly Grant*¹
¹Department of Biology, The University of Tampa
- (43) **Identification and antibiotic susceptibility of bacteria found in the shark oral cavity for the successful treatment of shark bite victims in Tampa Bay.**
Nick Greenberg*¹, Lilli Sutherland*¹, and Dr. Ann Williams¹
¹Department of Biology, The University of Tampa
- (44) **Evaluation of the oncolytic ability of Theiler's murine encephalomyelitis virus in glioblastoma cell lines GL26 and GL261**
Devon Grey*¹ and Dr. Eric Freundt¹
¹Department of Biology, The University of Tampa
- (45) **How HIV Diagnosing Rates are Affected by Various Social Identities in the United States of America in the years 2010-2016**
Blaise Guerriero*¹ and Dr. Bridgette Froeschke¹
¹Department of Biology, The University of Tampa
- (46) **Interspecific relationships between two groups of seagrass organisms in Tampa Bay: *Palaemonetes pugio* vs. *Probopyrus pandalicola* and *Syngnathus scovelli*, *Hippocampus zosterae* vs. *Callinectes sapidus*, *Menippe mercenaria*, *Lagodon rhomboides***
Daniela Gutierrez-Andrade*¹, Matthew Gamache*¹, and Ryan Tharp*¹
¹Department of Biology, The University of Tampa
- (47) **Correlation Between Dental Caries and an Individual's Diet**
Mahmoud Hamdallah*¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa

- (48) The advantages of using technological advancements in the Sub-Saharan African region for healthcare**
Micala Hammond*¹, Sara Setagrew*¹, and Dr. Miloslava Plachinova²
¹Department of Biology, The University of Tampa
²Department of Information and Technology Management, Sykes College of Business, The University of Tampa
- (49) Mutation Induced by the Mutagen EMS in sov, small ovaries, Causes Female Sterility in the *Drosophila melanogaster* Mutant fs(1)A1304.**
Myles Hammond*¹, Jillian Gomez¹, Leif Benner, MS², and Stephen Kucera, Ph.D.¹
¹Department of Biology, The University of Tampa
²Department of Biology, Johns Hopkins University
- (50) Carbon Abundances in Metal-Poor RR Lyrae Stars**
Benjamin Harney*¹ and Dr. Catherine R. Kennedy¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa
- (51) Functional Prediction of Hypothetical Proteins in Shrimp White Spot Syndrome Virus**
Paige Harris*¹ and Dr. Padmanabhan Mahadevan¹
¹Department of Biology, The University of Tampa
- (52) A Study of River Influences on Species Diversity in Seagrass Beds within Tampa Bay**
Lynn Heller*¹ and Nicole Kieda*¹
¹Department of Biology, The University of Tampa
- (53) Atomic Spectra Analysis**
Milani Hernandez*¹ and Dr. Simon Schuler¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa
- (54) Fluid Dynamics of Hammerhead Shark Locomotion**
Dr. Daniel Huber¹, Taylor Cunningham¹, Sara Casareto*¹, Haley Amplo¹, Jonathan Ford², and Summer Decker²
¹Department of Biology, The University of Tampa
²Morsani College of Medicine, The University of South Florida
- (55) Predation Behavior of Pinfish (*Lagodon rhomboides*) on Parasitic and Non-parasitic Grass Shrimp (*Palaemonetes pugio*)**
Kelcey Innes*¹ and Anastasia Klein*¹
¹Department of Biology, The University of Tampa
- (56) The Effects of Water Quality on Ctenophore Densities in Tampa Bay**
Olivia Isbell*¹, Allison Beall*¹, and Dr. Heather Masonjones¹
¹Department of Biology, The University of Tampa
- (57) Electric Propulsion**
Brolan Jennings*¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa
- (58) The Effects of a Variable Climate on Parasitoid Wasp (*Nasonia vitripennis*) Development and Grey Flesh Fly (*Sarcophaga bullata*) Infection**
Konar Johnson*¹, Natalie Olaya*¹, Anthony Brando*¹, and Dr. Taegan McMahon¹
¹Department of Biology, The University of Tampa
- (59) Seasonal Trends of Zooplankton in Sweetings Pond on the Island of Eleuthera, Bahamas**
Heather Johnson*¹, Dr. Rebecca Waggett¹, Dr. Bridgette Froeschke¹, and Dr. Heather Masonjones¹
¹Department of Biology, The University of Tampa
- (60) Associations Between *Vibrio* and the Planktonic Community Throughout Tampa Bay**
Heather Johnson*¹ and Dr. Rebecca Waggett¹
¹Department of Biology, The University of Tampa
- (61) Spatial Distribution of Cownose Rays (*Rhinoptera bonasus*) Within and Outside Honeymoon Island State Park in Relation to Shark Landings**
Ryan P. Johnson*¹
¹Department of Biology, The University of Tampa
- (62) Antibiotic Resistance of *S. aureus* in the Hillsborough River**
Alexander Johnston*¹ and Danielle Trupiano*¹
¹Department of Health Sciences and Human Performance, The University of Tampa
- (63) Contribution of chlorination by-products in the water leading to the head and neck cancer prevalence in Tampa Bay**
Aaron Joseph*¹, Dr. Michele Crosby², Dr. Matthew Mifsud³, and Dr. Kimberly Dobrinski¹
¹Department of Biology, The University of Tampa
²Department of Chemistry, Biochemistry, and Physics, The University of Tampa
³Morsani College of Medicine, The University of South Florida

(64) Synthesis and Characterization of Carbazole

Derivatives

Mariah Keller*¹, Tyler Weinhold¹, and Dr. Ashley Longstreet¹

¹*Department of Chemistry, Biochemistry, and Physics,
The University of Tampa*

(66) Strength of Water Filtering and Sterilization Methods

Morgan Kinnaird*¹ and James Davison*¹

¹*Department of Biology, The University of Tampa*

**(65) Increasing Effectiveness in Suicide Screening Within
Pediatric Emergency Departments**

Caitlyn Keville*¹, Luis Aguilar*¹, Savannah Billings*¹,
Stephane Coker*¹, and Robert Dilly*¹

¹*Department of Nursing, The University of Tampa*

Poster Session II

* Denotes authors presenting at symposium

- (1) **Physiological Effects of decreased pH in *Hippocampus zosterae***
Claudia Kirby^{*1}, Daniel Diaz^{*1}, and James Davison^{*1}
¹Department of Biology, The University of Tampa
- (2) **Retweets and Rebounds: An examination of social media postings by the Clippers and the Lakers**
Alexander Kirsch^{*1}
¹Department of Sport Management, The University of Tampa
- (3) **Feeding Preference of *Lytechinus variegatus* in the Tampa Bay**
Patrick Kish^{*1}, Anna Abbott^{*1}, and Dr. Heather Masonjones¹
¹Department of Biology, The University of Tampa
- (4) **A Comprehensive Analysis of Parasite Load on Organ Mass of *Bufo terrestris***
Jennifer Kor^{*1}, Ellis Morgan^{*1}, Maya Patel^{*1}, and Dr. Taegan McMahon¹
¹Department of Biology, The University of Tampa
- (5) **The effects of tourism on *Staphylococcus aureus* and MRSA prevalence in seawater at Clearwater Beach and Davis Island, FL**
Jennifer Kor^{*1} and Sydney Stahlman^{*1}
¹Department of Biology, The University of Tampa
- (6) **Analysis of Male *Syngnathus scovelli* Fecundity by Season**
Magaleate Kostelnik^{*1}, Julia Skowronski^{*1}, Dr. Heather Masonjones¹, and Dr. Emily Rose¹
¹Department of Biology, The University of Tampa
- (7) **The Presence of *Staphylococcus Aureus* in Common Cosmetic Products**
Victoria Kuska^{*1} and Amanda Ruszczycki^{*1}
¹Department of Health Sciences and Human Performance, The University of Tampa
- (8) **Instances of *Staphylococcus aureus* and MRSA on *Crassostrea virginica* in the Rivers and Bay of the Tampa Bay Watershed**
Audrey Larson^{*1}, Marissa Netti^{*1}, Blake Roberts^{*1}, and Gabrielle Specca^{*1}
¹Department of Biology, The University of Tampa
- 1(9) **Diversity of Epifauna on *Leptogorgia virgulata* in Tampa Bay, FL**
Haley Lasco^{*1}, Sarah Noonan^{*1}, Samantha Stewart^{*1}, and Dr. Michael Middlebrooks¹
¹Department of Biology, The University of Tampa
- (10) **Hygiene Practices in UT Bathrooms**
Emma Laveson^{*1} and Alison Minnehan^{*1}
¹Department of Health Sciences and Human Performance, The University of Tampa
- (11) **Structural Mechanics of the Billfish Rostrum**
Jonathan Low^{*1} and Dr. Daniel Huber¹
¹Department of Biology, The University of Tampa
- (12) **Foraging Success of *Lagodon rhomboides* in varying seagrass densities**
Jonathan Low^{*1}, Robert Peters^{*1}, and Finn Slattery^{*1}
¹Department of Biology, The University of Tampa
- (13) **Courtship behavior and mate selection of *Hippocampus zosterae* in regards to relative coloration**
Bridget Maloney^{*1} and Michaela Tremblay^{*1}
¹Department of Biology, The University of Tampa
- (14) **Variation of Ligand Caps and Substituents of Tripodal CMPO-based Agents for f-Element Extraction**
Andrea Martinez^{*1}, Wyatt Larrinaga^{*1}, and Dr. Eric Werner¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa
- (15) **Tampa Bay Community Cancer Network Experience-Colorectal Cancer Prevention**
Rachael Mastrangelo^{*1}
¹Department of Health Sciences and Human Performance, The University of Tampa

- (16) Ybor City Sex and STD/STI Knowledge, Perceptions, and Behavior Project**
 Rachael Mastrangelo*¹, Elizabeth Khoury*¹, Matthew McCormack*¹, Catherine Apostol¹, Ashley Reynolds¹, Claudia Jimenez¹, and Emily Violette¹
¹Department of Health Sciences and Human Performance, The University of Tampa
- (17) Relationship Between Gut Microbiota and the Brain in Parkinson's Disease Patients**
 Delaney McCall*¹
¹Department of Biology, The University of Tampa
- (18) The Effects of Microplastics on Photosynthetic Rate of the Green Algae, Ulva**
 Tara McDonald*¹, Leeanne Delrosario*¹, Tyler Horn*¹, and Dr. Daniel Huber¹
¹Department of Biology, The University of Tampa
- (19) The Effects of Nitrogen Pollution on Oysters Metabolic Rate**
 Bayley McKeon*¹, Brandon Insoft*¹, Caitlin Reisa*¹, and Amanda Darmochwal*¹
¹Department of Biology, The University of Tampa
- (20) Concentrations of *Staphylococcus aureus* in the Hillsborough River**
 Kyle Mesa*¹
¹Department of Biology, The University of Tampa
- (21) Feeding Behavior and Food Preference in two Tampa Bay Pipefish Species: the Gulf Pipefish (*Syngnathus scovelli*) and the Dusky Pipefish (*Syngnathus floridae*).**
 Hailey Mitchell*¹, Arianne Oseguera*¹, and Precious Paraoan*¹
¹Department of Biology, The University of Tampa
- (22) Survival Rate of Gut Bacteria in *Varanus niloticus* After Being Frozen on a 15-year Interval**
 Ana Victoria Rosario Molina*¹
¹Department of Biology, The University of Tampa
- (23) Nurse Residency Programs and the Effect on New-graduate Transition**
 Marissa M. Montemarano*¹, Molly M. Graves*¹, Shannon L. Cox*, Kayleen B. Rooney*, and Meg L. Villanueva*¹
¹Department of Nursing, The University of Tampa
- (24) Physiological Response to Temperature in Leopard Gecko's, *Eublepharis macularius*, Metabolic Rates**
 Magdalena Montewska*¹, James Sheehy*¹, Zuay Smith*¹, and Dr. Daniel Huber¹
¹Department of Biology, The University of Tampa
- (25) Assessment of Microbial presence on Waterpipe Tobacco Machines**
 Frederic Montz*¹, Magen Hoch*¹, Allison Barthel¹, Mary Martinasek¹, and Dr. Kimberly Dobrinski¹
¹Department of Biology, The University of Tampa
- (26) Carbon monoxide exposure in ambient air of Waterpipe Tobacco Lounges**
 Frederic Montz*¹, Nicole Tosto¹, Allison Barthel*¹, Mary Martinasek¹, and Dr. Kimberly Dobrinski¹
¹Department of Biology, The University of Tampa
- (27) Extracting and Assaying Natural Products from Marine Bacteria and Fungi**
 Lyndsey Moore*¹ and Dr. Christine Theodore¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa
- (28) Effects of Silver Nanoparticles on Human Umbilical Mesenchymal Stem Cells**
 Kaylan Morris*¹ and Dr. Pavan Rajanahalli¹
¹Department of Biology, The University of Tampa
- (29) Millikan Oil Drop Experiment**
 Mohammed Mourabit*¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa
- (30) An Investigation of the Genetic Diversity and Population Structure of an Isolated Bahamian Seahorse Population using Microsatellite Markers**
 Abayomi Munro*¹ and Dr. Emily Rose¹
¹Department of Biology, The University of Tampa
- (31) Testing the Effectiveness of Natural and Synthetic Antibiotics on the Growth of Gram Positive and Gram Negative Bacteria**
 Amanda Myers*¹
¹Department of Biology, The University of Tampa
- (32) The Salinity Tolerance of The Invasive *Perna viridis* and The Native *Crassostrea virginica***
 Shannon Myers*¹, Claire Spear*¹, Samantha Stewart*¹, and Casey Walsh*¹
¹Department of Biology, The University of Tampa*

- (33) Quantitative Analysis of CpG Methylation in the p73 promoter Region of Prostate Cells**
Angelo Nicolaci*¹, Dr. L. Michael Carastro¹, and Dr. Jong Y. Park²
¹*Department of Chemistry, Biochemistry, and Physics, The University of Tampa*
²*Department of Cancer Epidemiology, H. Lee Moffitt Cancer Center & Research Institute*
- (34) Structural Differences in Candidate Genes For Influencing Embryonic Diapause in Mustelids**
Lindsey Noordsij*¹ and Dr. Natalia Belfiore¹
¹*Department of Biology, The University of Tampa*
- (35) Analyzing Urban Habitat Variables and Lizard Communities in Urban Parks**
Caitlin L. Nordheim*¹, Dr. Heather L. Bateman², and Dr. Bridgette Froeschke¹
¹*Department of Biology, The University of Tampa*
²*Long-Term Ecological Research, Arizona State University*
- (36) Vaccinating Tadpoles Against the Pathogenic Chytrid Fungus**
Caitlin L. Nordheim*¹, Sarah E. Detmering¹, Dr. Kimberly Dobrinski¹, and Dr. Taegan McMahon¹
¹*Department of Biology, The University of Tampa*
- (37) Bacterial Growth on Avocado Skins**
Kelly Norling*¹ and Brianna Chastain*¹
¹*Department of Biology, The University of Tampa*
- (38) Growth Rate of *Callinectes sapidus* when Exposed to Phosphate**
Haley Nowowiejski*¹, Sarah Noonan*¹, and Dr. Heather Masonjones¹
¹*Department of Biology, The University of Tampa*
- (39) Diversity of Parasitic Infection in the Freshwater Snails *Melanoides tuberculata* and *Planorbella trivolvis***
Saudade Olivares*¹, Cassandra Harris¹, and Daniel Diaz*¹
¹*Department of Biology, The University of Tampa*
- (40) Physiological Differentiation Among Green Algal Turf Species on Soft Sediments in Mangrove Forests in Tampa Bay, FL.: A Case of Light Niche Partitioning?**
Megan E. Osgood*¹, Blake A. Roberts*¹, Jachelle L.F. Araiza*¹, Anna M.F. Abbott¹, Alexis S. Bernard¹, Logan J. Blascovich¹, Keri E. Fox¹, Laura W. Hearst¹, Arielle F. Pollock*¹, Samantha E. Scrudato¹, Drew W. Young¹, and Dr. Kevin S. Beach¹
¹*Department of Biology, The University of Tampa*
- (41) A Comprehensive Assessment of the Epidemiologic Implications of Periodontal Disease caused by *Porphyromonas gingivalis***
Maya Patel*¹ and Dr. Claudia Aguado-Loi²
¹*Department of Biology, The University of Tampa*
²*Department of Health Sciences and Human Performance, The University of Tampa*
- (42) Temperature Sensitive Phenotypes in *Drosophila melanogaster* Fruit Flies**
Alexandra Perez*¹
¹*Department of Biology, The University of Tampa*
- (43) Resource Trade off: Parasite load vs Anoles Gonad Investment**
Abigail Pickell*¹, Sam Murphy¹, Christina De La Cruz¹, and Dr. Taegan McMahon¹
¹*Department of Biology, The University of Tampa*
- (44) A Holistic Approach for the Treatment of Urinary Tract Infections**
Erica Ray*¹ and Dr. Bridgette Froeschke²
¹*Department of Chemistry, Biochemistry, and Physics, The University of Tampa*
²*Department of Biology, The University of Tampa*
- (45) Efficacy of Toothpaste on Oral Flora**
Francis J Robinson II*¹
¹*Department of Biology, The University of Tampa*
- (46) Occupational Exposures to Hazardous Drugs and Safe Medication Handling Practices for Healthcare Professionals**
Kayleigh Ross*¹, Kirsten Arrendale*¹, and Patria Casalduc*¹
¹*Department of Nursing, The University of Tampa*
- (47) The Impact of Dog Beaches on Nearby Human Recreational Beaches**
Courtney Scharer*¹ and Jennifer Gabriel*¹
¹*Department of Chemistry, Biochemistry, and Physics, The University of Tampa*

- (48) Whale Shark (*Rhincodon typus*) Retinal Pigments and Visual Foraging Ecology**
Katherine M. Serba*¹, Dr. Jeffrey I. Fasick¹, Haya Algrain², and Dr. Phyllis Robinson²
¹Department of Biology, The University of Tampa
²Department of Biological Sciences, University of Maryland Baltimore County
- (49) Influence of Assessment Features on Student Epistemology in Physics**
Kelli Shar*¹, Rosemary S. Russ², and James T. Laverty³
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa
²Department of Curriculum and Instruction, The University of Wisconsin-Madison
³Department of Physics, Kansas State University
- (50) Testing the Limits: A Qualitative Perspective on the Effects of High Stakes Exams**
Margaux Schmid*¹, Julia Moyer*¹, Samantha Minasian*¹, and Caroline Dohony*¹
¹Department of Nursing, The University of Tampa
- (51) Abundance and Occurrence of *Vibrio vulnificus* in the Hillsborough river in Tampa, FL in both seawater and *Crassostrea virginica***
Brianna Sierra*¹ and Anna Katherine Klein*¹
¹Department of Biology, The University of Tampa
- (52) Fecal Coliforms on Organic and Non-organic Produce in Supermarkets**
Brittany Small*¹ and Hayley Kudzmas*¹
¹Department of Biology, The University of Tampa
- (53) Using traditional mark-recapture techniques to “ground-truth” the use of natural facial patterns in an endemic seahorse population from the Bahamas (*Hippocampus erectus*)**
Joshua Smith*¹, Megan Pinder¹, Jessica Elson¹, Nicole Tosto¹, Dr. Heather Masonjones¹, and Dr. Emily Rose¹
¹Department of Biology, The University of Tampa
- (54) Fashion Icons of the Sea: How Decoration Rates of the Spider Crab, *Libinia dubia*, Differ in Varying Structured Habitats and in the Presence of Predator Cues**
Emma Stange*¹, Shivali Shah*¹, and Samantha Schreiter*¹
¹Department of Biology, The University of Tampa
- (55) The Effect of Stressors on Equine Fecal Microbiota Composition**
Amanda Stoufer*¹
¹Department of Biology, The University of Tampa
- (56) Prodigiosin: Pigment Extraction from *S. marcescens* for Cosmetic Application**
Lilli Sutherland*¹
¹Department of Biology, The University of Tampa
- (57) Abundance Analysis of Tabby's Star (KIC 8462852)**
Stacey Thomas¹, Simon C. Schuler¹, Cintia Fernanda Martinez², Katia Cunha^{2,3}, and Verne V. Smith⁴
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- (58) An Investigation into Band Iridescence of Female Pipefish**
Nicole Tosto*¹, Dr. Emily Rose¹, and Dr. Heather Masonjones¹
¹Department of Biology, The University of Tampa
- (59) A Comparison of Phototactic Behavior in Photosynthetic and Non-Photosynthetic Sacoglossan Sea Slugs**
Lauren Twele*¹, Rachel Moline¹, and Dr. Michael Middlebrooks¹
¹Department of Biology, The University of Tampa
- (60) Theoretical Adsorption of Lactic Acid Through Benchmark Metal-Organic Frameworks**
Abraham Varghese*¹ and Dr. Tony Pham¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa
- (61) Effects of Repeated Low-Stakes Assessments on Students' Test-Anxiety, Attitude, Self-Concept, and Achievement in a Non-Science Majors Chemistry Course**
Maria Villegas*¹ and Dr. Julia Y.K. Chan¹
¹Department of Chemistry, Biochemistry, and Physics, The University of Tampa

(62) Common Microbial Communities in the Kitchen and the Most Effective Antimicrobial Agent

Regina Visconti*¹ and Courtney Watkins*¹

¹*Department of Biology, The University of Tampa*

(63) Generating a Model of Human Obesity in *Danio rerio*

Byron Anthony Joseph Ward II*¹, Shivani Desai*¹, Zane Richardson¹, and Kimberly Dobrinski PhD.¹

¹*Department of Biology, The University of Tampa*

(64) Stomach Content Analysis of *Cichlasoma urophthalmus* (Mayan Cichlid) in the Tampa Bay Watershed

Kassandra Weeks*¹, Ryan Tharp*¹, and Dr. Mark McRae¹

¹*Department of Biology, The University of Tampa*

(65) Carazole Derivatives as Photocatalysts for the Dehalogenation of Substituted Benzenes

Tyler Weinhold*¹, Mariah Keller¹, and Dr. Ashley Longstreet¹

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SESSION 1 ABSTRACTS

(1) Isolation of Marine Sediment-Derived Bacteria that Produce Biologically Active Metabolites

Gabriella Albert*¹ and Dr. Christine Theodore²

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The purpose of this project was to show proof of concept for the isolation of marine bacteria producing natural products, mainly antibiotics, through the use of growth-specific conditions and exposure to stressful environments. Sediment samples were extracted from various beach sites in Florida, suspended in water and filtered, then serially diluted, and plated on nutrient agar plates to allow the growth of associated bacteria. Growth conditions were varied to select for different types of bacteria. Bacterial colonies were isolated through streak plating methods and tested against Methicillin resistant *Staphylococcus aureus* (MRSA). Colonies were further tested upon appearance of a zone of inhibition (ZOI), indicating the production of antibiotics. Testing included growth in nutrient specific media and toxicity assays. The goal was to generate a refined methodological process for isolating and identifying bacteria producing biologically active metabolites with potential medicinal benefits or pharmaceutical drug leads.

(2) Effects of Ultraviolet Radiation on *Staphylococcus aureus* Biofilm Integrity: an ultrastructure analysis using Scanning Electron Microscopy

Gabriella Albert*¹

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The goal of the present study was to evaluate the effects of ultraviolet (UV) radiation of various wavelengths (UV-A, UV-B, UV-C) on the integrity of *Staphylococcus aureus* biofilm structure. Scanning Electron Microscopy (SEM) was employed to visualize and qualitatively assess damage to the ultrastructure of *S. aureus* biofilms cultivated on plastic coverslips after exposure to UV-radiation. The results of the study revealed that the high-energy wavelengths of UV-B and UV-C could effectively induce apoptosis, with no evidence of intact biofilm structures and significant cellular damage after exposure. Therefore, such wavelengths of UV-radiation may be employed as a supplementary mechanism for targeted biofilm decontamination to further minimize the occurrences of biofilm-related nosocomial infections.

(3) Higher Training Volume Does Not Optimize Strength Adaptations in Resistance Trained Men

Daniel Aube*¹, Joshua Bradshaw¹, and Dr. Eduardo O. De Souza¹

¹Department of Health Sciences and Human Performance, The University of Tampa

This study aimed to examine the effects of three different resistance training volumes on muscular strength adaptations. Methods: Thirty-five resistance trained men (one repetition maximum [1RM] to body mass [BM] ratio= 2.09) were stratified based on the number of per week for quadriceps muscle they were performing prior to intervention, and were then randomly assigned to groups as follows: low (12 sets per week [12s], n=13), moderate (18 sets per week [18s], n=12) or high volume (24 sets per week [24s], n=10). Subjects trained twice a week and underwent an 8-wk lower-body RT. 1RM and strength endurance at 70% of 1RM (SE) for the back squat exercise (BS) were assessed at pre and post-testing. Rate of perceived exertion (RPE) and feeling scale (FS) was collected at the end of every training session. Results: For the 1RM BS, a main time-effect ($p \leq 0.0003$) indicated all groups responded similar across time. However, there was a strong trend towards significance group by time interaction ($p = 0.0521$), suggesting that 18s increased 1RM to a greater extent than 24s, and slightly greater than 12s. No significant changes were observed for the RPE and FS ($p \geq 0.05$). Conclusion: Our findings suggest that 18s and 12s might optimize maximum strength in resistance-trained males.

(4) Image-Based Analysis of Male *Syngnathus scovelli* Fecundity by Season

Kristin Bashline*¹, Magaleate Kostelnik*¹, and Julia Skowronski*¹

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The Gulf pipefish (*Syngnathus scovelli*) is a species residing in the Gulf of Mexico, including the Tampa Bay region. Addressing the reproductive success and fecundity of males across the seasons of winter and spring were the goals of the study. In addition, this study sought to confirm the accuracy of using images as a noninvasive means to accurately count embryos in the brood pouch. Male *S. scovelli* were collected from around Tampa Bay during winter and spring. Each season had a minimum of ten individuals that were randomly selected to carry out their pregnancy, while another minimum of ten were euthanized for embryo dissection. Pictures of individuals were analyzed through ImageJ for embryo count. Statistical tests completed in JMP suggest that there is a difference of offspring numbers between seasons, and a difference between actual counts and ImageJ counts. There is also a significant relationship between pipefish size and total offspring number. This work contributes to the further understanding of pipefish reproductive success and fecundity by season and size, as well as the validity of using ImageJ to count offspring.

(5) Predictive habitats for invasive Asian Green Mussel in Tampa Bay (*Perna viridis*)

Kristin Bashline*¹, Dr. Bridgette Froeschke¹, and Dr. Michael Middlebrooks¹

¹Department of Biology, The University of Tampa

Invasive species are a growing global threat to ecosystems, biodiversity, and economies. From competition for resources to predation they can greatly reduce or kill native species and can damage industries based on said native species and damage infrastructure. The Asian green mussel *Perna viridis*, native to the Indo-Pacific, has successfully invaded the Caribbean and was first seen in Tampa Bay in 1999. It has been found that *Perna viridis* is a threat to local oyster species, *Crassostrea virginica*, as it competes for resources, has shorter gestation and can smother oyster reefs. While *Perna viridis* has been in Tampa Bay for nineteen years there is little data about its density and range of invasion. Spatial analysis of ecological tolerances could be useful in predicting where *Perna viridis* can be found in Tampa Bay. With the use of ArcGIS 10.6 this study aimed to use optimal and vulnerable conditions as well as known habitats of Tampa Bay to create said predictions. Several artificial reefs throughout the bay were identified as the most and least likely places to find *Perna viridis*, georeferencing will be done to test predictions. If predictions are proven accurate, they will provide valuable information for protecting Tampa Bay.

(6) The Effects of Varying Light Intensities on Dwarf Seahorse Behavior

Marie Bear*¹, Michelle Melilli*¹, and Maddie Mueller*¹

¹Department of Biology, The University of Tampa

The effect of varying light intensities on the behavior and growth rates of *Hippocampus zosterae* was tested. Juveniles were placed evenly across six tanks, with two tanks being in complete darkness, two in 12 hours of light and 12 hours of dark, and two in constant light. Red lights were used when observing the completely dark tanks. Observations of activity levels took place over the course of a week. Growth rates were collected by taking the initial and final average size of each tank and analyzing the results. ANOVA tests were run for the growth rates for dark, medium, and light tanks, in addition to a contingency table test that was run to measure activity levels across the three light intensities. The outcome of these tests showed no significant results. The results overall suggested that varying light intensities did not affect the behavior and growth on *Hippocampus zosterae* which matched that of other seahorse species. This implies that the results of the experiment are accurate.

(7) Chromatic Adaptation Theory

Patrick Boisvert*¹, Alex Rivera*¹, and Christian Shaffer*¹

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Water attenuates wavelengths of light differently such that certain wavelengths of light are more prevalent at certain depths. The Chromatic Adaptation theory states that algae have evolved to inhabit different depths and use different light waves in order to reduce competition. This experiment examined the effect of light wavelength (e.g., blue, red, green, white) on the photosynthetic rate of green and red algae, which are generally found in shallow and deep waters respectively. Algal specimens were placed in metabolic chambers to measure dissolved oxygen over time to determine rate of photosynthesis with respect to light wavelength. The comparison will show how the different species would be able to handle the light levels at different depths as well as show whether they truly did evolve to make best use of different wavelengths to avoid competition (i.e., niche partitioning). It is predicted that the red algae will be more efficient with the wavelengths of light found at depth (e.g., blue, green) and the green algae will be more efficient with the wavelengths of light at the surface (e.g., red).

(8) Does Response of Weekly Strength Training Volume on Muscular Hypertrophic Adaptations in Trained Individuals

Joshua Bradshaw*¹, Daniel Aube¹, and Dr. Eduardo O. De Souza¹

¹Department of Health Sciences and Human Performance, The University of Tampa

To examine the effects of three different ST-volumes on muscle size and mass in strength-trained males. Methods: Thirty-five strength-trained men (one repetition maximum [1RM]: body mass [BM] ratio= 2.09) were stratified based on training volume performed prior to intervention (sets per week for quadriceps muscle), and were then randomly assigned to one of three experimental groups: low (12 SET per week, n=13), moderate (18 SET per week, n=12) or high volume (24 SET per week, n=10). Subjects underwent an 8-wk lower-body RT program consisting of squat and leg-press exercises that were trained twice a week. Muscle thickness (MT) was assessed using ultrasonography at 50% and 75% distal between the lateral condyle of the femur and greater trochanter, and local lean mass accretion of thigh muscle was assessed via region of interest utilizing DEXA (ROI) at pre and post-testing. Results: For the MT and ROI assessments, there was a significant main time-effect ($p \leq 0.0003$) indicating all groups responded in a similar fashion. Conclusion: Our data suggest that there is no dose-response relationship between ST volume and hypertrophic adaptations in trained males.

(9) Uncovering disordered proteins among copy number variants in *Danio rerio*

Anthony Brando*¹ and Dr. Kimberly Dobrinski¹

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Stretches of DNA vary within individuals. Known as Copy Number Variants (CNVs), these stretches may contribute to what makes individuals unique but have been linked to many known diseases such as cancer. Intrinsically disordered protein regions (IDPs) are proteins whose sequence allows for changes in 3-dimensional folding under varying cellular environmental conditions. IDPs within the Homo sapien genome from the DisPro database were used for the already discovered 250 IDPs from the Homo sapien genome. Two hundred five of 250 proteins were found within the *Danio rerio* genome using NCBI BLAST. Forty of those proteins were found to be disordered and copy number variable in *D. rerio*. These proteins were evaluated using GO categories of which 19 were binding proteins including: cytoskeleton, enzyme, transcription factor, transcription initiation factor, and ubiquitin binding. Associations between gene transcription of IDPs and overlapping copy number variants were evaluated using MatrixEQTL. Of the 40 proteins, 19 were found to have an association with cancer development, showing that CNV and IDPs may be involved in the initiation or progression of cancer.

(10) Tissue specific compensatory regulation of gene expression associated with copy number variants in *Danio rerio*

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This study seeks to compare copy number variants (CNVs) and gene expression levels in the kidney and liver of *Danio rerio* (zebrafish). CNVs refer to the loss or gain of copies of a region within the genome. Array CGH was used to determine regions of the genome that were copy number variable. Expression arrays were used to measure differential gene expression, as well as miRNA [a type of non-coding RNA involved in the regulation of gene expression] expression levels. eQTL analysis, using matrix eQTL (linear regression model), was used to explore how CNVs may affect gene expression. qPCR tests were performed to confirm and compare regions of the genome thought to contain CNVs against those thought to be ultra-conserved and qRT PCR was utilized to confirm differential gene expression levels. eQTL analysis was also performed to determine the association between CNVs and miRNA expression levels. Western blots will be performed to investigate targets of miRNAs believed to be acting at the level of translation and associated with CNVs. eQTL analysis will determine if CNVs are associated with miRNA or gene expression and if miRNAs regulate gene expression to compensate for CNV effects.

(11) Genetic Characterization of Introduced Populations of the African Jewelfish, *Hemichromis letourneuxi*, to the Waterways of Florida.

Elizabeth Burke*¹, Dr. Pam Schofield², and Dr. Natalia Belfiore¹

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²Wetland and Aquatic Research Center, U.S Geological Survey

The African jewelfish, *Hemichromis letourneuxi*, is a cichlid fish, native to northern Africa, and commonly traded as an aquarium fish worldwide. It was first described in the waterways of Florida in the early 1960s, and it is currently flourishing and spreading throughout the State. This species is highly predatory and there is evidence that local native fishes do not do as well in its presence as they would otherwise. In order to provide baseline information about the African jewelfish in Florida, we are using genetic techniques to characterize the connectivity and relative isolation of regional populations. We are working on developing multiple nuclear sequence markers from non-coding regions of the African jewelfish genome in order to characterize the phylogeography of this species in Florida. Using a multi-locus analysis, we are planning on creating a phylogeographic tree of African jewelfish populations. Nuclear marker results will be compared to mitochondrial data already collected in order to expand our understanding of this species phylogeography. This tree serves as a hypothesis depicting the history of the introduction(s) of this species to Florida.

(12) Strain comparison of *Batrachochytrium dendrobatidis*

Samantha Byrne*¹ and Dr. Taegan McMahon¹

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Batrachochytrium dendrobatidis is a fungus which causes the disease Chytridiomycosis in amphibians across the globe. There are many different strains of this fungus leading to the disease. In order to determine more about the virulence of this pathogen it is necessary to compare the morphological and physiological aspects of each different strain. The strains analyzed in this experiment include strains from Arizona, two from Panama, California, and Louisiana. The diameter of zoospores and zoosporangia were measured and the number of discharge tubules per zoosporangium was determined for each strain. The measurements and data analysis were done using ImageJ and R program. There was a difference in zoosporangia in diameter amongst the five strains as well as a difference in number of discharge tubules. These findings could help us better understand why some species are more virulent than others.

(13) The Effect of Flow Rates on Predation of *Donax variabilis* by *Luidia clathrata*

Rachel M. Cacace*¹, Sarah E. Detmering*¹, Gabrielle M. Vaillancourt*¹, and Dr. Heather Masonjones¹

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Slender armed sea star (*Luidia clathrata*), considered a predator and coquina (*Donax variabilis*), the sea star's prey, are found along the shorelines of the subtropical waters of Tampa Bay. Sea stars have heightened reception to chemical cues and the predation choice of sea stars on coquina clams was analyzed against induced flow rates (no, low, and high flow). This was achieved using a flow bar in a ten-gallon tank of synthetic seawater kept at 34 ppt. One dead and one live coquina were placed in opposite ends of the tank and the seastar was placed in the center. Flow rates were changed over a series of treatments and each feeding regime was timed. The findings of this study suggest that there is no significant difference in flow rate when compared to predation time, as well as no association between prey choice and flow rate. Additionally, behavior was observed and there was no significant difference in flow rate and foraging behavior. These findings indicate that predation on coquina by sea stars is not dependent on flow rate.

(14) Identification of Intrinsically Disordered Proteins in Adenoviruses

Rachel Cacace*¹ and Dr. Padmanabhan Mahadevan¹

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In general, proteins have unique three-dimensional structures that determine their function. However, there are proteins known as intrinsically disordered proteins (IDPs) that lack a well-defined three-dimensional structure and exist in a state of different conformations where they fulfill their functions in a disordered or unstructured state. IDPs have been discovered to function in various processes such as cell-cycle progression, lipid transport, and function as signaling hubs in protein-protein interaction networks. IDPs have also been linked to various neurodegenerative diseases, cancer, diabetes, cardiovascular disease, etc. The proteomes of viruses such as Zika, Ebola, and HPV have been found to contain intrinsically disordered protein regions (IDPRs) and it is thought that further understanding of these regions can lead to disorder-based drugs and vaccine development. Adenoviruses also have these IDPRs in their capsid and the E1A proteins that regulate transcription and the cell cycle. These viruses infect all vertebrates and cause a variety of diseases in humans such as gastroenteritis, keratoconjunctivitis, and acute respiratory disease. We performed a comprehensive bioinformatics analysis of human and non-human adenoviruses in order to identify IDPRs in their proteomes. Proteins had varied content of IDPRs and these results may allow us to gain further insight into adenovirus proteomes.

(15) The Impact of Microplastics on *Crassostrea virginica* Filtration Efficiency

Jenna Carpenter*¹ and Brianna Sierra*¹

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There has been increasing concern among biologists about whether or not microplastics are affecting the health of marine organisms and human health. While some studies have shown microplastic effects on juvenile *Crassostrea virginica*, there are few studies which focus on how adult *Crassostrea virginica* are affected. This experiment focuses on the ability of adult *Crassostrea virginica* to filter and dispose of different densities of fluorescent polyethylene microbeads obtained from Cospheric Innovations in Microtechnology. *Crassostrea virginica* were collected in Tampa Bay and once acclimated, were exposed to treatment concentrations of 0.167 microbeads/ml and 0.083 microbeads/ml (500-600 um) at a density of 1g/cc over a six-hour time interval. An examination of adult oyster clusters exposed to different amounts of microbeads showed the adult oyster's ability to take in microplastics. Some oysters filtered in microbeads, demonstrating the potential for microplastics to impact oysters and human health. This issue is prevalent in oyster populations and can impact higher trophic level organisms through bioaccumulation. These results demonstrate the issues associated with microplastics and encourage future research to be conducted.

(16) The Effect of Rising Temperature on Blue Crab, *Callinectes sapidus*, Metabolism: Physiological and Economic Implications Related to Climate Change

Sara Casareto*¹, Ashley Sabatino*¹, Marjola Deda*¹, and Griffin Baughn*¹

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Current climate change is causing change in various abiotic factors worldwide, including temperature. Variability in abiotic parameters affects biological systems at numerous levels, including at the individual species level. With the rapid change of temperature being observed in today's climate, it is raising the question of how this will impact the physiology and performance of organisms. In this study, the effects of temperature on the metabolic rates of the economically important blue crab, *Callinectes sapidus*, is recorded over an increasing temperature range to represent the influence of climate change. The dissolved oxygen levels will be measured over the temperature change to determine rate of respiration which is representative of the metabolic rate. Statistical ANOVA will be used to determine relationship between metabolic rate and temperature. With increasing temperature, it is important to determine whether blue crab fisheries will be negatively impacted by global climate change, especially if blue crab populations can no longer meet consumer demand.

(17) Growth Rate and Survival Rates of Juvenile *Elysia subornata* Sea Slugs Vary Depending on Diet

Sara Casareto*¹ and Dr. Michael Middlebrooks¹

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Elysia subornata is a sacoglossan sea slug native to the Caribbean and Florida. This herbivorous slug feeds exclusively on siphonaceous green algae in the genus *Caulerpa* by piercing the algae with a radular tooth and then suctorially removing the contents. While most sacoglossans are feeding specialists, *E. subornata* is polyphagous, eating multiple species of *Caulerpa*. In this study, growth rates of juvenile *E. subornata* were observed amongst individuals hatched at the same time. Individual slugs were fed for five weeks on five different species of *Caulerpa* to determine if there was a difference in growth and survival rate based on diet. In order to test this, the lengths of the individual *E. subornata* were measured weekly. Starting lengths between each treatment were not significantly different. All slugs feeding on *C. sertularoides* survived. Of the surviving juveniles there was a significantly longer final length for the slugs feeding on *C. sertularoides* compared to the other species. This indicates that although polyphagous, feeding on certain species of *Caulerpa* could improve juvenile survival and fitness. It is currently unknown if *E. subornata* displays feeding preference for algal species that provide optimal growth.

(18) Mechanical Analysis

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The purpose of this experiment is to determine the effects of friction on a cart-pulley-hanger system. Measurements were taken of the cart's positive acceleration down the track as well as the cart's negative acceleration due to friction. All measured results were consistent with theoretical predictions. The moment of inertia of the pulley used in the experiment was calculated to be $2.28 \times 10^{-4} \pm 1.85 \times 10^{-4}$ which was inconsistent with accepted values. Based on the results of this experiment, further experimentation is required to determine the effects of air resistance, pulley friction, and string mass on the accelerations of car-pulley-hanger systems.

(19) The Effect of Temperature & Salinity on the Metabolic Rate of *Perna viridis* and *Crassostrea virginica*

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The Asian Green Mussel (*Perna viridis*) was introduced into the Gulf of Mexico in the 1990s and first observed in Tampa Bay in 1999. It is now an established invasive species that competes for space and resources with the native Eastern Oyster (*Crassostrea virginica*). An experiment of factorial design orthogonally crossed the treatments of maximum and minimum annual salinity and temperatures from Tampa Bay to test the specimens in stressful conditions. Dissolved oxygen concentration was measured to determine the rate of metabolic processes. It was hypothesized that *P. viridis* would have less fluctuation in metabolic rate for each treatment than *C. virginica*. Results indicate that *C. virginica* cannot acclimatize as readily as *P. viridis*. Therefore, in periods of high environmental stress *P. viridis* may outcompete the native species.

(20) Habitat Preference of *Hippocampus zosterae* in Seagrass Beds Containing *Gracilaria tikvahiae*

Allicyn Cole*¹, Hannah Smith*¹, and Claudia Kirby*¹

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The goal of this study was to determine the habitat preference of dwarf seahorses, *Hippocampus zosterae*. This was conducted in a lab setting using individual seahorses and groups containing two males and two females to determine if there was a preference for artificial seagrass or for artificial seagrass with the red algae *Gracilaria tikvahiae*. Data showed that groups of seahorses selected seagrass more than individual seahorses, with 74.29% of seahorses in groups selecting seagrass and 54.29% of individual seahorses selecting seagrass. The data displayed that larger seahorses (around 31.5 mm) showed preference for seagrass, while smaller seahorses (around 30 mm) showed preference for seagrass paired with algae. A significance was found when comparing the group treatments, which showed that more groups preferred seagrass. This was correlated to a larger average individual size in seahorse groups than the average individual size in individual treatments. This study provided a better understanding of the preferred habitat of this species. Seagrass populations have been declining, allowing for more algae to inhabit these areas due to its faster growth rate. The findings in this study indicate that this shift in environment would provide more habitat for juvenile seahorses, while the habitat for adult seahorses would diminish.

(21) The Effects of Chemical and Biological Gold Nanoparticles on Human Dermal Fibroblasts

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Gold nanoparticles are found in consumer products that affect the skin such as cosmetics and anti-aging creams. This study explored the concentration dependent cytotoxic effects of both biogenic AuNPs and chemically synthesized citrate-capped AuNPs on human dermal fibroblast (HDF) cells. First, biogenic gold nanoparticles (AuNPs) were synthesized with 0.5 mM HAuCl₄•3H₂O using *Camellia sinensis* (black tea) as a reducing agent. Then, the crystallinity, size, and charge of the nanoparticles in suspension were analyzed by high-resolution transmission electron microscopy (HR-TEM), dynamic light scattering, and zeta potential analysis. Next, we analyzed the effects of AuNP concentration and exposure time on HDF cells. Immunofluorescence microscopy was performed using phalloidin and 4, 6 Diamidine-2-phenylindole dihydrochloride (DAPI) to analyze their effects on the actin filaments and nuclei of HDF cells. We assessed cell proliferation and viability using MTT assay, LDH assay, and flow cytometry. These results showed that the cytotoxic effects were similar for biological and chemical AuNPs, and at 72 hours of exposure, both AuNPs caused an increase in cell growth. Overall, there is no significant difference in the toxicity of biological and chemical AuNPs. In the future, we will analyze HDF cell gene expression after AuNP exposure with real-time PCR.

(22) Use of the Photoelectric Effect to Measure Planck's Constant

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Quantum Mechanics is the basis of our understanding of the microscopic universe. In the early 20th century, physicists such as Max Planck and Albert Einstein created the fundamental ideas of quantum theory that lead to the creation of the Schrodinger Equation by Erwin Schrodinger. The Schrodinger equation is the quantum mechanics equivalent to Newton's force equation, which can be used to determine the motion of a particle. Planck changed the way we view matter by quantizing the energy of light by the product of h and n where h is Planck's constant and n is light's frequency. In our experiment, we used the photoelectric effect to measure Planck's constant. The photoelectric effect is when a particle of light collides with a surface of metal and ejects an electron with a kinetic energy proportional to the frequency of the incident light. Einstein formulated an equation to find the energy of the ejected electrons based on the light's frequency, and we used it to determine the value of Planck's constant. Our experimentally determined value is $2.127 \times 10^{-34} \text{ m}^2 \text{ kg/s}$.

(23) Construction of a Computational Phylogenetic Pipeline using Python

Patrick Davis*¹ and Dr. Padmanabhan Mahadevan¹

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Construction of an automated phylogenetic pipeline is an imperative project for increasing efficiency during phylogenetic analysis of proteins. To create a phylogenetic tree, a sequence must be blasted against a database while maintaining the query sequence, aligned with the hits of the blast results, trimmed to allow for tree construction, analyzed for most likely tree configuration, then exported for analysis. By creating a pipeline for automation, multiple sequences can be run with ease. Subsequent processes, such as sequence clustering and taxonomy identification, can be added optionally to the pipeline for horizontal gene transfer analysis. The pipeline would allow users to create phylogenetic trees for a large quantity of sequences. These sequences could be automatically run for minutes, hours or days to export phylogenetic trees without the biologist needing to manually run each one. This would result in increased speed and allocate more time to the user. The program, written in Python, creates an output pipeline between the programs NCBI Online Blast P or DIAMOND Blast P, MAFFT multiple sequence alignment, trimAl file formatting, IQ-TREE treefile generation, and Treebender SVG tree output. Additional trees can also be optionally created using gene clustering from Sonic Paranoïd.

(24) Parasite load of *Entomosporium mespili* on Indian hawthorn bushes (*Rhaphiolepis sp.*) may differ based on location and surface areas of leaves

Kamila De La Cruz*¹, Blake Roberts¹, Casey Walsh*¹, Nicole Arbelaez¹, and Dr. Taegan McMahon¹

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We often think of parasites in animals and ignore those that impact plants. Plants use their leaves for primary production, and when fungal pathogens take over that prime space this may impact plant health and photosynthesis success. Often these fungal parasites are wind dispersed and so fungal parasite load may differ on leaves based on the location of the leaf on the plant, and the overall surface area of the leaf. A survey was taken on fifteen Indian hawthorn bushes (*Rhaphiolepis sp.*) looking at the number of *Entomosporium* leaf spots (*Entomosporium mespili*) on 10 leaves from each of four locations (top, middle, bottom and inside) in each bush. For each leaf we identified the presence and abundance of the fungal colonies, the percentage of green, and whether the leaf was newly developed or matured. Preliminary data analysis shows a high prevalence and abundance of leaves on the top and outer surface of the bush compared to the inside. This may cause the fungal spores to have easier access to these areas through wind current. Understanding these parasites dynamics helps with developing landscape systems that minimizes parasite impact on Indian hawthorn bush ascetics.

(25) The Effects of Bd Metabolites on Freshwater Invertebrates

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Batrachochytrium dendrobatidis (Bd) is a fungus that is causing extinctions of amphibians around the world. Bd is an aquatic fungus that attacks the keratin in the skin of amphibians and the carapace of some freshwater invertebrates, like crayfish. Bd metabolites have been shown to damage the gills of crayfish in the absence of live Bd, but little research is done in this field. Here, we investigated the effects of Bd metabolites, in the absence of Bd, on developing mosquitos and the bioindicator *Daphnia magna*. There is a negative relationship between Bd metabolite concentration (measured as the concentration of Bd removed from the inoculant) and *Daphnia* survival ($p = <0.01$), but there was no effect of Bd metabolites on mosquito mortality. Mosquito larvae exposed to high levels of Bd spent less time in larval stages and more time as pupae than control and low Bd dose mosquitoes ($p < 0.040$). The presence of Bd metabolites induced molting in *Daphnia* and mosquito larvae, which may have an impact on their development. Our findings indicate exposure to Bd contaminated water, even in the absence of direct contact with Bd may adversely affect some freshwater invertebrates.

(26) Testing for Antibiotic Resistance Among *Staphylococcus aureus* Species in Recreational Fisheries

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Antibiotic resistance is one of the greatest threats to public health and occurs when microbes develop the capability to defeat the drugs that were once designed to destroy them. This resistance occurs naturally in the environment, but due to anthropogenic causes, such as improper disposal and misuse of antibiotics, this natural resistance is accelerated exponentially. Antibiotic resistant microbes enter the aquatic environment from human and animal sources and are able to spread their genes to other water-indigenous species, passing along the resistant gene. This study took into account the presence of aquatic antibiotic resistant microbes and specifically targeted the presence of *Staphylococcus aureus* on recreational fisheries in Tampa Bay. Various species of fish from Tampa Bay were swabbed on the body and mouth to look at the presence of *S. aureus*. The antibiotic Oxacillin was used to test for antibiotic resistance among all the confirmed strands of *S. aureus*. Approximately 20% of the samples were confirmed to be resistant to the antibiotic. This finding allowed us to identify how far the resistance gene has spread throughout the natural environment and gives a starting point for future monitoring of samples.

(27) A Quantitative Approach to Estimating Fishing Pressure on Important Recreational Fisheries within Tampa Bay

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Just like many coastal ecosystems, the Tampa Bay area is a complex ecological community with organisms relying on one another in many different ways. These organisms aren't the only ones having an effect on one another, as recreational fisheries is a widely popular industry in the Tampa Bay waters as well. Fishing pressure is an important concept to keep in mind because either it can help regulate populations or it can cause a decrease in populations. Our project aimed to use spatial fisheries data to examine the fishing pressure on important recreational fish in Tampa Bay. This was done by identifying all of the boat ramps within the Tampa Bay area and analyzing the spatial patterns of legal size significant recreational fisheries (sheepshead, red drum, gulf flounder, Atlantic croaker, spotted seatrout, gray snapper, and black drum) by means of length. It has been found that the ideal boat ramps have varied amongst the different species. As research was continued and surveys were conducted at local boat ramps, it was determined that the predictions the maps displayed were accurate at predicting the fishing pressure in Tampa Bay.

(28) Cliques aren't just for Humans: Spatial Distribution of a Geographically Isolated Bahamian Population of the Lined Seahorse, *Hippocampus erectus*

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The lined seahorse, *Hippocampus erectus*, is distributed across a wide range of the Western Atlantic Ocean. The most scientifically intriguing population lies in an isolated salt water lake on the small island of Eleuthera, Bahamas. This community of seahorses has unique physical characteristics, uncommon nocturnal behavior, and a distinctively large density of animals. These fascinating findings led to further questions about examining the role of depth, habitat cover, and season on spatial distribution and to investigate the spatial distribution of animals across space and time in relation to the other sites in the lake. These questions were analyzed through a visual form of geographic mapping and a statistical form of nearest neighbor analyses. Based on these spatial maps, it appears that larger body size is correlated with deeper depths and seahorse clusters are formed based on available vegetation. Sharing the results from this study will allow for a better understanding of the natural ecology of a vulnerable species as listed on the IUCN Red List (IUCN 2016). Furthermore, it will provide crucial knowledge to officials who are working towards the creation of a Bahamian national park site for this lake and all of its marine inhabitants.

(29) Don't Mind Me: Behavioral Reactions of the Dwarf Seahorse (*Hippocampus zosterae*) when Exposed to Chemical and Visual Predator Cues

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The effect of predator cues on the dwarf seahorse (*Hippocampus zosterae*) has yet to be studied. The main aim of this project was to aid in filling this knowledge gap by examining the relationships between visual and chemical predator cues on the physical stress behaviors of seahorses. The blue crab (*Callinectes sapidus*) was utilized as the predator for the chemical and visual components in this study. Twenty-four (24) seahorses were examined and behavioral observations were recorded when exposed to water inhabited by the blue crabs and to the presence of the physical crab in the tank. Behaviors were defined as body posture, swimming duration, water column position, body position, and ventilation rate. Each behavior allowed for a determination of overall seahorse stress level and physical responses during trials. After completion of data analyses, it was found that the dwarf seahorse does not have a strong predator avoidance reaction to the blue crab. Significant differences were only detected for body posture and swimming duration when comparing males and females independent of the predator treatment. Due to the cryptic nature of the family *Syngnathidae*, this study proposes that the dwarf seahorse demonstrates a lack of response as a predator avoidance technique.

(30) The Real Terrors of the Bay: *Enterococcus* and Fecal Coliform levels in Tampa Bay over a twenty-year period

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Fecal coliforms and Enterococci are both microbial species that are commonly and widely used to indicate water quality. As the Tampa Bay area continues to grow in population, water sewage treatment plants, marine transportation, and tourism the water's health is of grave concern. The goal of this study was to determine the relationships between fecal coliforms and Enterococci bacterial levels across geographic zones of Tampa Bay over the past twenty years. Data was downloaded from the Tampa Bay Watershed online database and analyzed using GIS software and the program R. Initial results indicate that all locations were significantly different in levels of Enterococcus with the exception of Old Tampa Bay and Middle Tampa Bay. Also, amongst all locations, differences in levels of fecal coliforms were significant. The conclusions drawn from this study will aid greatly in the management of the Tampa Bay watershed and pinpoint areas of greater health concern.

(31) Effect of Salinity on Cercarial Shedding Rate of *P. trivolvis*

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Gastropods, many of which are now considered threatened or endangered, serve as intermediate host for many parasites, including many parasites associated with humans. Freshwater snails (e.g. *Planorbella trivolvis*) shed the infectious stage (cercariae) of parasites like flatworms and flukes (Class Trematoda). The objective of this study was to determine how environmentally relevant levels of salinity, manipulated by the addition of NaCl or CaCl₂, directly affect the cercarial shedding rate of *P. trivolvis*. This species of freshwater snail is common in the Tampa Bay region. Snail host health directly affects their susceptibility to parasites and the strength of their parasitic infection. We exposed snails (n = 17 snails/treatment) to different salinities (250-3750 μ S/cm) composed of either NaCl or CaCl₂. With this treatment regime we were able to compare the cercarial shedding across salinities and naturally relevant chemical compounds. We found a difference in the cercarial shedding rate among different salinities of the same chemical compound and are expecting to see differences in shedding rate between the chemical treatments as well.

(32) Climate Change Effects on Gray Sea Stars (*Luidia clathrata*)

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Current threats to the ocean environment, including increases in acidity and temperature, could cause major physiological and ecological changes in marine organisms. The effects of changes in pH and temperature on the gray sea star, (*Luidia clathrata*) were investigated by measuring metabolic rates in using factorial design with individuals exposed to conditions matching present day conditions (20°C & 8.1) and those predicted for 100 year from now (26°C & 7.9) by the Intergovernmental Panel on Climate Change. Given the effects of kinetic energy on enzymatic systems and that echinoderms are weak acid regulators we expect to see significance effects on metabolic rate.

(33) Determine the Effect Diet Has on Asexual Growth of *Rhodactis* sp. and the Concentration of Zooxanthellae (*Symbiodinium*)

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Coral reefs are some of the most ancient biodiverse ecosystems on our planets. They produce more oxygen and food than any other biome on Earth. However, it is slowly being destroyed by temperature change and an increase in carbon dioxide (Ocean Acidification). In order to protect these necessary and sufficient communities, a better understanding of these exotic creatures must be compiled to ensure the success of societies that rely on these reefs. The purpose of this study was to test the effect of diet on the asexual growth of *Rhodactis* sp. and determine the concentration of zooxanthellae present. Two corals were randomly placed in each of six tanks. Two tanks were fed a diet of phytoplankton, two tanks a diet of amino acids, and two tanks a diet of oyster feast. The coral was measured before placing them in the tanks and once a week for three weeks. At the end of the experiment, the diet and size were compared to determine if there was a relationship and the zooxanthellae concentration was calculated. With the information and measurements gathered through this experiment, the degree to which these corals and their symbionts interact can be used to create healthier reefs.

(34) Internal and External Parasite Load of Bess Beetle (*Odontotaenius disjunctus*)

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Often wild animals have to handle both internal and external parasites simultaneously. Despite these parasite burdens they also have to feed, grow and breed, which can all be costly. Here, we examined whether the internal and external parasites of the Bess beetle (*Odontotaenius disjunctus*) correlate with one another, and whether they impact the size of the beetle or their external sex characteristics (horn). Beetles (n = 33) were weighed, length was measured, and photos were taken to measure beetle mandible and horn size (ImageJ was used for accuracy). We quantified exterior mites (*Centrouropoda almerodai* and Family Acaridae) and internal nematodes. We found a significant positive correlation between beetle mandible size and nematode abundance (p=0.005) but nematode load had no effect on the weight or size of the beetle. Possibly, the larger the mandibles the more nematodes the beetles ate. We also found a negative significant correlation between white mite load and beetle mass (p=0.008). The total parasite load did not affect total area of the beetle. These results were not what we hypothesized but pave the way for future research regarding the comparison of physiological factors of Bess beetles in relation to their environment and parasite load.

(35) SN1 alkylation of 1,3-dicarbonyl compounds in aqueous reaction mixtures

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The SN1 alkylation of C-nucleophiles is typically requiring a strong Lewis or Brønsted-Lowry acids and alkyl halides and the electrophile. The use of green chemistry is to minimize the hazardous waste that is produced in organic chemistry reactions. In this study the reaction of 1-phenylethanol activated with dibenzoylmethane at 60°C with Hafnium as a catalyst and the product was tested and will be discussed.

(36) Environmental DNA: a Tool for Quantifying Cryptic Fishes within Tampa Bay

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Detection of environmental DNA (eDNA) is a novel technique that has recently transformed the field of conservation genetics. eDNA sampling can readily be used to detect and identify species, preventing the use of destructive habitat sampling or harmful tissue extractions. Our goal is to validate the efficacy of eDNA as a tool to understand seahorse diversity and distribution in Tampa Bay. Thus far, eDNA has been filtered from water samples in the laboratory using known densities of the seahorse, *Hippocampus zosterae*, and seahorse eDNA has successfully been identified from these laboratory samples. As the project continues, the ability to identify different species of seahorses using water samples taken from aquaria at The Florida Aquarium will be tested. Also, eDNA sampling will occur within Tampa Bay to validate the feasibility of using this technique to identify cryptic species in the field. This study will help fill knowledge gaps of eDNA as a non-invasive, feasible tool for tracking organismal distributions in flowing waters and will aid in the conservation of threatened or rare species.

(37) The Effects of Water Quality and Sediment Grain Size on the Presence of *Emerita talpoida* at High (Clearwater Beach, FL) and Low (Indian Rocks Beach, FL) Human Impact Beaches

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This study focused on the interactions and connections between mole crabs in comparison to high vs. low human impact beaches along with water and sediment quality. Sediment cores were completed at Clearwater Beach (high impact) and Indian Rocks Beach (low impact) in order to observe the presence or absence of *Emerita talpoida*. At each site there was 5 sediment and 5 water samples collected at the mid-swash zone in order to assess sediment grain size and water quality. There were significant differences between turbidity and alkalinity levels between sites; Clearwater Beach had higher levels of both. However, there was no difference in sediment grain size based on site. While there was no *E. talpoida* found in any of the sediment cores, there was a presence of coquina which served as an indicator of *E. talpoida* occupation in the habitat. The higher levels of turbidity and alkalinity could have been the result of no *Donax variabilis* being found at Clearwater Beach in comparison to Indian Rocks Beach. This creates a great concern because *E. talpoida* populations are key indicators of overall beach health.

(38) Vaccination as a Technique to Induce Acquired Resistance in *Pseudacris regilla* to *Batrachochytrium dendrobatidis*

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Batrachochytrium dendrobatidis (Bd) has caused the extinction and extirpation of hundreds of amphibian species around the world. The life cycle of Bd consists of two major stages: the zoospore (the infectious part of Bd), which release chemical metabolites used to burrow into the host, and the zoosporangia stage, which embeds in the host and releases new zoospores. Here, we are investigating whether we can vaccinate a different Bd-affected species, Pacific chorus frogs (*Pseudacris regilla*), to Bd. We exposed these frogs to three different treatments: artificial spring water (control), dead zoospores alone (no metabolites), and dead zoospores with metabolites. We exposed each frog to its respective vaccine treatment every day for two weeks and then dosed all of the frogs with live Bd to determine how resistant they were to the pathogen. We found that the treatment with the metabolites was the most effective treatment for inducing an acquired resistance to Bd, and that the dead zoospores alone were not an effective vaccine. This work has helped us refine the vaccine treatment for Bd and shows that a second at risk species can develop an acquired resistance given the appropriate vaccine.

(39) The Effect of Human Traffic on Fecal Coliform Concentrations at Weeki Wachee, Homosassa, and Ulele Springs

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Escherichia coli (*E. coli*) has been used as an indicator species for fecal-coliforms since the U.S. Environmental Protection Agency suggested it in 1986. *E. coli* is used as an indicator species because of its ability to best predict swimming-associated gastrointestinal illnesses. The purpose of this experiment was to determine the concentrations of *E. coli* in spring water in the Greater Tampa Bay area that receive high levels of human foot traffic on a weekly basis. The headspring of Weeki Wachee Spring, Homosassa Spring, and Ulele Spring were sampled to test for concentrations of *E. coli*. Further research was done to test for levels of antibiotic susceptibility to ampicillin. At the spring that received the most human foot traffic, the highest concentration of *E. coli* correlated with the larger zones of inhibition to ampicillin. People visit these Florida springs on a daily basis to kayak, swim, and paddle board while being exposed to un-monitored concentrations of *E. coli* bacteria.

(40) Mutation Induced by the Mutagen EMS in Sxl, Sex lethal, Causes Temperature Sensitive Female Sterility in the *Drosophila melanogaster* Mutant fs(1)K741.

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Drosophila melanogaster shares 60% of its genome with humans and many biological processes are conserved across these species as well. Classic complementation testing using available deletion chromosome stocks was employed to map the EMS induced mutant fs(1)K741 for temperature sensitive female sterility (above 25°C) to a specific narrow region of the X chromosome. The previously defined region that spanned 1.5 Mb now spans only 257 kb. This narrow region is the precise location of the master binary switch gene for sex-determination in *Drosophila*, Sxl (Sex lethal). The splicing pattern of the 10 exons in Sxl is ultimately responsible for the cascade in early development that instructs female (exon 3 excluded) or male (exon 3 included) development. Exon 3 contains a stop codon, so males produce a truncated, inactive Sxl protein. PCR of cDNA from homozygous fs(1)K741 females yielded both female and male isoforms of Sxl mRNA, while wild-type females only had female-specific Sxl mRNA splicing. Work continues to confirm both mRNA isoforms are detectable above 25°C, identify how the mutation affects alternative splicing, and whether alternative splicing is normal at lower temperatures.

(41) Epidemiology of Myasthenia Gravis Represented in the Life Course of Individuals and the Factors that Impact the Quality of Life of these Patients

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The focus of the paper is on Myasthenia Gravis (MG), which is a chronic autoimmune degenerative neuromuscular disease and its course through patients that have obtained the disease. There was research conducted on the cause, distribution, effects, treatment, and current status of this disease. Research was conducted using databases, such as ProQuest. Additional research was obtained through reputable websites, such as the National Institute of Neurological Disorders and Stroke. Myasthenia Gravis is a prevalent disease in society, targeting anyone regardless of gender, age, or ethnicity. Its symptoms become more serious as time lived with the disease increases. There are two main forms of the disease: ocular and generalized. There is currently no cure for Myasthenia Gravis; however, there are treatments. Physicians and researchers are currently working to find a cure. There are ways patients can lessen the effects of Myasthenia Gravis, such as joining support groups. Without the control of voluntary muscle movements, a person with Myasthenia Gravis suffers in trying to perform everyday activities. With current funding for research and a patient registry, the goal for a world without Myasthenia Gravis is hopeful.

(42) A Comparison of Measles Outbreaks Pre and Post Generation of Vaccines

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Measles is a contagious infectious disease that affects the lives of others by the rubeola virus. There have been countless measles outbreaks not only across the United States but around the world which is devastating due to the virus being high preventable by vaccination. The data analysis comprises the number of measles cases starting from the time the vaccination was produced up until present time. The data analysis includes the use of R which is a programming software for statistical computing and then the data will be visually interpreted in 2D and 3D using ArcGIS Pro which allows the data to be interpreted easier. As measles are not common within the United States, the source of the outbreaks is from countries that are in the eastern hemisphere; therefore, the research being conducted includes the measles cases on a worldwide scale in hopes to find the source of the virus. Through finding the source of the measles outbreaks, the process of educating parents on how crucial vaccination is can take affect and the number of measles cases can be reduced.

(43) Identification and antibiotic susceptibility of bacteria found in the shark oral cavity for the successful treatment of shark bite victims in Tampa Bay.

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Shark mouths possess a wide array of pathogenic bacteria that can potentially cause infection in a victim of a shark attack. Although a very relevant concern, the relative amount and species of bacteria in the mouth microflora of sharks in Tampa Bay has not been studied extensively. Therefore, treatment options for shark bite victims is not based initially on the specific pathogens that could cause infection. In addition, the pathogens could be resistant to the initial standard treatment given to shark bite victims to treat bacterial infections. The objective of this study was first to analyze the relative amounts and species types of relevant pathogenic bacteria of the mouth microbiota in bonnethead sharks in the Tampa Bay area. Antibiotic susceptibility of the isolate bacteria was then tested for the commonly used antibiotics. Although the physical injuries involving these sharks are not life-threatening, they are commonly seen amongst fisherman after accidental by-catch and improper handling. Bacterial swabs from the mouth cavity were collected from 8 bonnethead sharks in Tampa Bay, subsequently transferred onto selective and differential media plates for analysis of bacteria amounts and species typing, and further identified via gram staining. The data indicated the presence of multiple species of bacteria in every shark, with an average of 3.4 bacterial isolates per shark. The most common strains in the sharks based on colony morphology on selective/differential plates and gram staining were *Vibrio spp* (87.5%), *Staphylococcus spp* (50%), various gram-negative bacilli (50%), and *Enterococcus faecalis* (37.5%). Antibiotic susceptibility was tested by the Kirby Bauer method on viable, isolated bacterial colonies. Results indicated that the recommended antibiotic therapy for bonnethead shark attack victims in Tampa Bay is intravenous or oral doxycycline.

(44) Evaluation of the oncolytic ability of Theiler's murine encephalomyelitis virus in glioblastoma cell lines GL26 and GL261

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Glioblastoma multiforme (GBM) is type of brain cancer with no effective treatments. Oncolytic viruses are currently being tested as potential therapeutics in GBM. We recently found that Theiler's murine encephalomyelitis virus (TMEV), specifically downregulates expression of four transcription factors, known as Olig2, Pou3F2, Sox2, and Sall2 that are required for proliferation of GBM cells. However, these studies were done in stem-cell derived oligodendrocyte progenitor cells and it is not known if TMEV can disrupt expression of these genes in GBM cells. In this study, we have evaluated the susceptibility of glioma cell lines GL26 and GL261 to infection by two strains of TMEV, known as DA and GDVII. Cells were inoculated with virus and the infection efficiency was evaluated by immunofluorescence microscopy to detect expression of capsid proteins within the cells. While glioblastoma cells were susceptible to both strains, DA infected with greater efficiency than the GDVII strain. Sox2 was found to be expressed by GL26 cells using immunofluorescence and TMEV infection downregulated Sox2 expression. These results demonstrate that TMEV infection of GL26 and GL261 cells can be used as a model to understand how picornaviruses affect GBM gene expression and proliferation.

(45) How HIV Diagnosing Rates are Affected by Various Social Identities in the United States of America in the years 2010-2016

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Since the first cases of HIV/AIDs were diagnosed in the 1970s, certain social identities were at a higher risk of infection than others. In recent years, multiple studies have been conducted to research which identities were most at risk of contracting HIV/AIDs. This study intended to show what social identities had higher HIV diagnoses after 2009 in the United States. Over ten social identities were mapped and statistically analyzed to see if there was a relationship between any of those social identities and HIV diagnosis. To understand how each social identity was related to HIV diagnosis, each data point was mapped per county individually and then compared to one another as well as put through an ANCOVA and compared. It was interpreted from the data that income, race, drug usage, and sexual orientation had significant relationships with HIV diagnosis. Those results were like many studies that were conducted between the 1980s and 2000s. For further research, education level and sexual health education will be looked at, since they can be indicators for HIV/AIDs. To better understand which social identities are affected by HIV/AIDs, data on sexual orientation and gender identity would need to be acquired on the US Census.

(46) Interspecific relationships between two groups of seagrass organisms in Tampa Bay: *Palaemonetes pugio* vs. *Proboptrus pandalicola* and *Syngnathus scovelli*, *Hippocampus zosterae* vs. *Callinectes sapidus*, *Menippe mercenaria*, *Lagodon rhomboides*

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Seagrass beds are some of the most important and productive environments in the world, hosting a wide diversity of organisms that establish to a variety of interspecific interactions. Habitat structure influences these interactions and is an important factor for shaping community structure. In two seagrass beds in Tampa Bay, predator-prey relationships between the syngnathids *Syngnathus scovelli* and *Hippocampus zosterae* and the predators *Callinectes sapidus*, *Menippe mercenaria*, and *Lagodon rhomboides* were assessed. Additionally, the relationship of how the parasitic isopod *Proboptrus pandalicola* affects the size of the shrimp *Palaemonetes pugio* was examined. At each site, syngnathids, predators, and shrimp were collected and counted from a seine net running along a transect; shrimp body measurements were recorded as well. Seagrass bed structure and sample location had a greater impact on *S. scovelli* density rather than interspecies interactions. Parasitic infection did not have a significant effect on *P. pugio* size. More data are required to increase confidence on our findings as well as provide a baseline for future studies.

(47) Correlation Between Dental Caries and an Individual's Diet

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Dental caries is an epidemic that will only continue to grow with the sugar's society is consuming and the carelessness society has with the intake of food. This experiment is testing how an individual's diet has on the susceptibility of dental caries. The experiment tests how consuming fruit and hard candy has on dental caries susceptibility as well as a person's normal diet. This experiment is important in order to show which foods can increase a person's susceptibility to dental caries. The experiment was conducted by a Snyder test which will test the saliva and its acidity which is the causing factor of how individuals obtain dental caries. Predictions on the experiment is that people consuming hard candy are more susceptible to dental caries than an individual that would consume fruit.

(48) The advantages of using technological advancements in the Sub-Saharan African region for healthcare

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Sub-Saharan Africa has the highest disease burden in the world, nevertheless, has only 2% of the world's doctors. The main focus of this case study is to analyze the healthcare system and the geographical boundaries halting productivity. Also, identifying ways we can use certain technological advancements to improve productivity in the healthcare system. 90% of the world's pediatric HIV cases are reported to live in the sub-Saharan African region, without access to life-saving drugs, one out of three of HIV-infected infants by the age of one die and 50% by two years of age. By researching and developing new ways to intervene, this brings awareness to the problems with efficient solutions while educating the citizens. For instance, the benefit of using mobile technologies is gaining access. Geographical distance, low resources, and a shortage of well-educated healthcare professionals prevent millions of people from receiving the healthcare they need. Some countries in sub-Saharan Africa are adopting a better healthcare system by using digital technologies. Aside from telehealth, the analysis of sensor and wearable technology, self-serve kiosks, and educational seminars will be discussed. Along with the analysis of pediatric care, medical laboratories, and medical officials for the healthcare section.

(49) Mutation Induced by the Mutagen EMS in sov, small ovaries, Causes Female Sterility in the *Drosophila melanogaster* Mutant fs(1)A1304.

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Genetic screens are used in *Drosophila melanogaster* to find genes specific for biological processes, including temperature independent female sterility mutants. Some of these screens, previously completed by using the mutagen EMS, causes mutations affecting oogenesis that have not been characterized. Complementation testing of the uncharacterized X-linked mutant, fs(1)A1304, refined a region spanning 1.8 Mb to 145 kb. DNA sequencing and bioinformatic analysis of 25 homozygous fs(1)A1304 females was performed. This work revealed 20-point mutation candidates (3 intron variants, 4 synonymous variants, 6 upstream variants, 5 downstream variants, and 2 5'/3' untranslated region (UTR) variants) within this region. Mutations that fell within regulatory elements, upstream/downstream of genes, synonymous variants, and 5'/3' UTRs were excluded. No missense or nonsense splicing region candidate mutations were found leaving no significant mutations. We then looked for structural variants using the software BreakDancer to analyze the sequencing data for inserted or deleted sequences and revealed a deletion of 318 base pairs within the promoter of the gene sov. Work has begun to conclusively determine whether this deletion causes female sterility in fs(1)A1304.

(50) Carbon Abundances in Metal-Poor RR Lyrae Stars

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We report measurements of the carbon abundances in six different RR Lyrae variable stars. This was accomplished by analyzing the optical spectra from each of the stars and measuring the carbon from the CH G-band feature. The echelle spectra were obtained with 3.5 meter telescopes, and the data were processed using IRAF. For each star, synthetic model spectra were created using MOOG, which were then plotted against the real spectra. In each model, the carbon abundance was varied to determine the best estimate in each star. Our estimates are then compared to theoretical abundance yields of RR Lyrae stars.

(51) Functional Prediction of Hypothetical Proteins in Shrimp White Spot Syndrome Virus

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The white spot syndrome virus (WSSV) is a large enveloped virus, with a tail-like appendage, and circular stranded DNA (Cifuentes et al, 2003). The genome of the virus encodes about 180 proteins. The WSSV infects both wild and commercially farmed crustaceans (Jiang et al, 2017). There are no current treatments for the white spot syndrome virus and it can cause 100% mortality in a population in as little as 5 to 7 days (Hameed et al, 2017). The WSSV is found in India, China, Southeast Asia, and in South and Central America (Snippe et al, 2001). The aim of our study was to elucidate the functions of hypothetical proteins in the WSSV CN01 strain. The functions of more than 100 hypothetical proteins were predicted using functional prediction software including ESG, PFP, PhyloPFP, SingalP, Pfam, PROSITE, and Phyre2. Confidence scores for the prediction of the function of the hypothetical proteins were found to be as high as 100%. The results will help us gain further insight into the WSSV proteome and potentially its pathogenicity as well.

(52) A Study of River Influences on Species Diversity in Seagrass Beds within Tampa Bay

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The focus of this study was to investigate whether significant species diversity differences exist in seagrass beds with greater river or tidal influences within Tampa Bay. Samples were collected south of the river deltas of the Alafia, Little Manatee, and Manatee rivers, within the bay. Various sampling techniques included, pushnetting a total of 45 meters at each location, measuring salinity using a refractometer and species diversity using Simpson's and Shannon's Diversity Indexes, were completed and statistically compared. The Alafia river seagrass bed was observed to have the lowest salinity of the three locations, which could be attributed to the freshwater input from the Hillsborough and Alafia rivers. This same seagrass site had the highest species diversity value and the Little Manatee River had the lowest species diversity value with a moderate salinity level. This indicated that salinity does not dictate diversity and other factors such as exposure to currents and water circulation could influence diversity. Seagrass beds are one of the most important marine communities, a better understanding of their diversity and the role of freshwater inputs can lead to the conservation and advocacy of their important role as foundation species, primary producers, and habitat for commercially valuable species.

(53) Atomic Spectra Analysis

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Wavelengths of spectral lines of gases can be determined by exciting the electrons in a gas, then scanning atomic spectra of emitted photons. This understanding is used to analyze gas abundances and metallicities in stars around our galaxy to determine what they are comprised of. For this particular lab, the atomic spectra of hydrogen, helium, and mercury were scanned using a grating spectrophotometer that measures light intensity as a function of true angle. The angle between the first two order maxima were measured per gas to calculate their wavelengths. We find the wavelength of the hydrogen alpha line to be 630 nm and the mercury blue line to be 422 nm.

(54) Fluid Dynamics of Hammerhead Shark Locomotion

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The hammerhead sharks are characterized by an extremely unusual head morphology, the cephalofoil, the function of which has long been debated. While advantages have been identified for sensory systems, the role of this structure in locomotion is poorly understood. Therefore, we sought to quantify the effect of cephalofoil shape on fluid drag. Preliminary results indicate that fluid drag is affected by cephalofoil shape. The largest mean drag coefficient for pitch was associated with the largest, most ancestral cephalofoil of the winghead shark *Eusphyrna blochii*, whereas the smallest mean drag coefficient for pitch was associated with the smallest, most derived cephalofoil of the bonnethead shark, *Sphyrna tiburo*. Mean drag coefficients were linearly related to cephalofoil width, indicating that drag reduction may be a selective pressure in the reduction of cephalofoil size. All species also demonstrated a reduction in drag force and drag coefficient at positive pitch angles, which supports the observation that sharks maintain positive angles of attack during swimming to generate lift with the ventral body surface.

(55) Predation Behavior of Pinfish (*Lagodon rhomboides*) on Parasitic and Non-parasitic Grass Shrimp (*Palaemonetes pugio*)

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Seagrass beds are a great hub for a diversity of organisms like pinfish (*Lagodon rhomboides*) and grass shrimp (*Palaemonetes pugio*). By studying if pinfish have a preference of preying on grass shrimp with or without parasites, we can see if they are aware of the health of their environment. We collected these organisms in a protected seagrass bed and brought them into a laboratory for observation. We starved the pinfish for twenty-four hours and then observed their predatory behavior on the grass shrimp. We found that there was no significant relationship between pinfish preferences on predation of grass shrimp with or without parasites, with equal attack rates on both. Therefore, we can infer that pinfish are unaware of the health of their environment and are unaffected by these parasitic shrimps when ingested.

(56) The Effects of Water Quality on Ctenophore Densities in Tampa Bay

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Tampa Bay is a key area of study when measuring water quality. Ctenophores in particular are heavily influenced by water quality and have been documented to increase population size in areas of higher pollution, and thus influencing surrounding ecosystem functions. The increase of a Beroe species population could also lead to the increase of nonindigenous species. These ideas are what caused the interest in this study. It was hypothesized, in areas with more human impact, or lower water quality, there would be higher ctenophore densities. To analyze the water quality in multiple areas around Tampa Bay, the phosphate, nitrate, nitrite, temperature, pH and salinity levels were measured at each sampling site or in the lab. The results of this study did not find a high density of ctenophores in the Tampa Bay area, but the amount found were in areas of higher phosphate levels. Future work would include additional sampling sites to produce a more accurate analysis of the water quality vs. ctenophore density. This is an important area of study because higher ctenophore densities can act as an indicator of declining water quality, allowing for prevention strategies for other organisms and ecosystems to be put in place.

(57) Electric Propulsion

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Early space exploration was plagued with many difficulties related to the technology of the time and lack of experience in spaceflight; the first spacecraft to escape the orbit of earth did so only because it missed its intended target of the moon in 1959. Years of trial and error have highly refined every aspect of spaceflight, leading to probes successful enough to explore the solar system by 1972. A deep understanding of orbital mechanics is needed to successfully deliver any craft to Earth orbit, let alone anywhere beyond. Here we will explore the types of trajectories and spacecrafts necessary to reach various outer solar system bodies.

(58) The Effects of a Variable Climate on Parasitoid Wasp (*Nasonia vitripennis*) Development and Grey Flesh Fly (*Sarcophaga bullata*) Infection

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A parasitoid wasp (*Nasonia vitripennis*) lays its larvae inside the larvae of grey flesh flies (*Sarcophaga bullata*). The larvae of *N. vitripennis* develop on the living fly larvae until they are ready to emerge, at which time they will consume their host from the inside out. Parasites are substantially smaller than their hosts and it has been shown that they are able to adapt to a variable climate more rapidly than their hosts. Here, we investigated the effect of temperature (18, 23 and 28°C) and temperature variability (a constant temperature or a temperature shift) on the wasp-fly relationship. We enclosed one fly larvae with three wasp larvae, and housed them at three temperatures (18, 23 and 28°C) for seven days, half of the systems housed in each temperature were shifted to a new temperature and housed there for the duration of the experiment. We tracked wasp and fly development every two days. At the end of the experiment (day 42) the fly larvae capsules were dissected, and we noted larvae survival and wasp larvae presence and quantity. Preliminary data analysis found that on average wasps that started development in the cooler temperature (18°C) had higher success as a parasitoid compared to those that started in the higher temperatures.

(59) Seasonal Trends of Zooplankton in Sweetings Pond on the Island of Eleuthera, Bahamas

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Sweetings Pond is a unique salt-pond ecosystem in Eleuthera, Bahamas. Given its geographically isolated nature, Sweetings Pond supports unique populations that differ dramatically from nearby oceanic systems. In particular, the morphologically distinct lined seahorse (*Hippocampus erectus*). Distinct populations emphasize the importance of studying this location and its overall community structure. To further understand this ecosystem, the zooplankton community of Sweetings Pond was analyzed. Our objectives included determining if the zooplankton community differed across the pond, differed seasonally and/or if environmental parameters played a role in zooplankton distribution. Zooplankton samples were collected from two research sites at the northwest (Caves) and southwest (Quarry) ends of Sweetings Pond. Environmental parameters of water temperature (°C), salinity (ppt), and pH were also collected. Spatial analysis of the data was conducted using ArcGIS Software. Hot Spot Analysis was performed on the zooplankton density data and Kriging Analysis was executed on the environmental parameters. The results of the Hot Spot Analysis indicate seasonal trends of zooplankton density and distribution. However, these trends cannot currently be attributed to the abiotic factors explored. Additional sampling across the pond and throughout seasons is necessary. Furthermore, biological interactions within the zooplankton, such as predation and reproductive cycles, should be considered.

(60) Associations Between *Vibrio* and the Planktonic Community Throughout Tampa Bay

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Vibrio is a genus of bacteria whose species naturally inhabit warm, marine waters throughout the world. Many of these species are pathogenic to humans, which makes predicting outbreaks of vital importance. Considerable information is still being discovered about *Vibrio* ecology, therefore additional studies of *Vibrio* in the marine environment are necessary. Previous relationships between *Vibrio* species, the planktonic community, and environmental factors have been described, but these relationships have not been explored in Tampa Bay. Zooplankton tows were performed at six different locations in Tampa Bay. Three sites were located in the inner bay, while three were closer to the Gulf of Mexico. Whole water samples and environmental parameters were also collected from each site. Zooplankton samples were separated into three classes: copepods, *copepod nauplii*, and *crab zoea* and resuspended in sterile saline. Whole water samples were diluted to 10⁻¹, 10ml, and 30ml. Zooplankton and water samples were vacuum filtered, and the filter paper plated on Thiosulfate-Citrate-Bile-Sucrose (TCBS) agar plates. The plates were incubated at 37°C for 24 hours and assessed for growth. Associations between *Vibrio* and the planktonic community, as well as patterns in environmental factors provide valuable insight to the bacterial community of Tampa Bay.

(61) Spatial Distribution of Cownose Rays (*Rhinoptera bonasus*) Within and Outside Honeymoon Island State Park in Relation to Shark Landings

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Pinellas County is known for its multitude of highly diverse barrier islands, one of which is Honeymoon Island State Park. On the eastern side of the island is Saint Joseph Sound, an intracoastal waterway containing important seagrass habitat. Cownose Rays (*Rhinoptera bonasus*) are benthopelagic mesopredators that migrate seasonally to Saint Joseph Sound. The species' spatial distribution within the waterway was analyzed in relation to shark landings (potential predators) from years 2013-2018. Multiple spatial maps were constructed using geoprocessing tools from ESRI ArcGIS. Further analysis indicated that Cownose Rays and Shark species experience an inverse relationship within the sample sites. From years 2013-2018, 5.5% of Cownose Ray landings and 87.6% of shark landings were inside the state park boundary. Boggy Bayou, a seagrass flat, located outside the state park boundary contains 93.2% of all Cownose Ray landings and 12.4% of all shark landings. Data configured by the GIS program aided in locating aggregation sites of Cownose Rays and identified their preferred local habitat. Further analysis, along with habitat restoration inside Honeymoon Island State Park would help to ensure the abundance of Cownose Rays within the local area.

(62) Antibiotic Resistance of *S. aureus* in the Hillsborough River

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Antibiotic resistance is a growing problem around the world. If bacteria become acclimated to the antibiotics that are used today, the alternatives are going to be much more expensive, toxic, or eventually no antibiotics will be effective anymore. Methicillin resistant *Staphylococcus aureus* (MRSA) is one of the most prevalent antibiotic-resistant strains, causing nosocomial infections, and is found in many hospitals; it is referred to as the hospital super-bug. The waste waters from hospitals have been known to carry antibiotics, as well as resistant strains of bacteria. Our purpose was to quantify the amount of antibiotic-resistant *Staphylococcus aureus* in the Hillsborough River at different locations to see if the prevalence of these resistant strains increased at locations closer to Tampa General Hospital. In order to quantify the resistant strains of *S. aureus*, we took samples, diluted them and filtered them onto Mannitol Salt agar plates. The colonies were then tested for resistance to amoxicillin, oxacillin, tetracycline, and vancomycin via the Kirby-Bauer disk diffusion test. These results will lead people to become more aware of the antibiotic resistance issue in our world and to take action to properly dispose of their antibiotics.

(63) Contribution of chlorination by-products in the water leading to the head and neck cancer prevalence in Tampa Bay

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Trihalomethanes (THMs) are a group of four chemicals formed during the disinfection and chlorination of water. Unfortunately, these by-products accumulate in sources such as pipes for drinking water and have been linked to various fetal defects and cancers. Each of the four THMs are on the Environmental Protection Agency's published list of regulated concentrations for disinfection by-products. While human papilloma virus (HPV) is a main cause of oropharyngeal cancers within the tongue and tonsils, this study focuses on the oral cavity's susceptibility for DNA damage by carcinogenic chemicals in the water. Rates of head and neck cancers in Pasco and Pinellas counties are much higher than Florida's average rate. Analysis of the trihalomethane concentration via head-space gas chromatography will be used to compare local concentrations to those regulated by the EPA. Free chlorine data between 2018 and 2019 spring term will be compared with each other and compared to THM levels within the Tampa Bay area. THM levels found from analysis are used to compare to the THM levels supplied by water companies. Prospective studies will include correlation between the prevalence of head and neck cancers and levels of trihalomethanes.

(64) Synthesis and Characterization of Carbazole Derivatives

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Radical reactions often use harmful or toxic chemicals to complete the reaction. Using photocatalysis, radical reactions can be complete without the use of harmful chemicals and the catalysts may be used in small quantities, reducing waste. Many photocatalysts on the market can be quite expensive, so the use of one more cheaply available is important, carbazoles. In order to complete the reaction, the carbazole needs to absorb light at a higher wavelength, so increasing the conjugation by adding aromatic rings allows the carbazole to absorb light at the increased wavelength. This allows for the reaction to be complete using a cheaper light and helps to avoid side reactions. This research has been focused around synthesizing derivatives of carbazoles and then characterizing these derivatives. To characterize a cyclic voltammogram, a fluorescence spectra, and a UV-visible spectra were done to determine the reversibility of the reaction, the redox potentials, and the absorbance of the carbazoles.

(65) Increasing Effectiveness in Suicide Screening Within Pediatric Emergency Departments

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Suicide is the second leading cause of death among children and adolescents ages 10 to 17 years. Children and adolescents who attempt suicide or have had suicidal thoughts may have mental health disorders ranging from general anxiety disorder to depression. Symptoms of these disorders can often be managed, which therefore may prevent suicidal ideation. Unfortunately, though, while approximately 1.5 million adolescents in the United States receive their primary healthcare in the Emergency Department (ED), numerous cases of mental health disorders go undiagnosed and the risk for suicide increases. This increase in suicide risk may be due to low-income status, limited access to a healthcare provider, or lack of education to parents about the importance of preventative health through primary care visits. About 39% of all individuals who die from suicide have visited an ED 12 months before their death. This project reviews the circumstances in which pediatric Emergency Department suicide screenings occur, analyzes various pediatric suicide screening tools, and provides evidence for the need of a nationwide standardized suicide screening tool to be used in emergency pediatric healthcare facilities.

(66) Strength of Water Filtering and Sterilization Methods

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This study was to determine the strength of certain water filtering and sterilization methods to see how well they work and if the water is safe and clean enough to drink. This study is aimed towards people who use these for camping, hiking, and other outdoor activities. Outdoor activities are driving Florida's economy and we need to make sure the systems for clean water are in place. Dehydration in the Florida summer can be lethal. Most hikers, campers like to pack light so not needing to carry around gallons of water is very beneficial if the products are doing their job. The most commonly known and widely used Brita filter, life straw, Aqua tabs, and Micropur tablets will be the techniques studied. Water samples from two separate sites along the Hillsborough River (one public and one private) were collected and then filtered and plated on MacConkey agars to grow fecal coliforms. Coliforms were counted 24 and 48 hours after incubation. The number of coliforms that grow were used to rank the filtering processes. Two different sites were used to see if foot traffic affected the concentration of fecal coliforms.

SESSION 2 ABSTRACTS

(1) Physiological Effects of decreased pH in *Hippocampus zosterae*

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This study we manipulated the ocean water pH levels based on future predictions for 500 years from now. Climate change has been proven to show negative effects on marine life because of a decrease in pH which affects physiological systems. Dwarf seahorses, *Hippocampus zosterae*, were placed in acute exposure tanks to lowered pH. Vertebrates are pH regulators so they must increase their metabolic rates in order to maintain an optimal internal pH so they can perform efficiently enough to get resources. Dissolved oxygen was recorded over 20-minute trials in five seahorses under four different treatments to get a slope which determined the seahorses metabolic rate for each treatment. Those treatments had conditions for present and future ocean water. Those metabolic rates were compared to determine the effects of decreased pH in ocean water.

(2) Retweets and Rebounds: An examination of social media postings by the Clippers and the Lakers

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“The development of social media has provided a great opportunity for sports organizations to establish relationships with the public and their core stakeholders.” (Wang, Zhou). One sport that dominates social media usage is men's professional basketball. The National Basketball Association (NBA) is able to highlight their players through the sports' structure: ten total players on the court, with clearly identifiable athletes. Los Angeles is the second largest city in the United States with nearly 4,000,000 people, and has two NBA teams, the Lakers and the Clippers. The purpose of this paper is to analyze how these two franchises utilize the social media platforms Twitter and Instagram to engage their followers. By collecting data for every post between February 19th and March 19th, the research indicates that when removing bias by factoring out the difference in followers, the Lakers are more effective in social media fan activity. The two separating factors are, the Lakers' brand value, and the impact of perennial superstar LeBron James. The comparison between the two teams is not for competition purposes, however, is an indicator of several social media factors from the team perspective, along with its future use in terms of advertising.

(3) Feeding Preference of *Lytechinus variegatus* in the Tampa Bay

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Tampa Bay, located on the central west coast of the Florida peninsula has diverse and abundant seagrass beds. One of the year-round residents, *Lytechinus variegatus* (sea urchin), thrives on the variety of food sources available to them. This experiment investigated the food preferences of *Lytechinus variegatus* sea urchins. It was hypothesized that *L. variegatus* would show preference for the most abundant local seagrass. *L. variegatus* were collected near the mouth of the Bay and transferred to smaller individual tanks where 6 food sources in a gelatin matrix were presented: Oysters (*Crassostrea virginica*), Acorn Barnacles (*Balanomorphs*), Manatee Grass (*Syringodium filiforme*), Turtle Grass (*Thalassia testudinum*), Green Sea Grapes (*Caulerpa racemosa*), and unflavored gelatin (Knox Gelatin). The urchins were left for 48 hours before the gelatin was removed from the tank, inspected for signs of consumption, and reweighed. A strong preference was shown for the control (unflavored gelatin), while oysters and manatee grass had the highest avoidance rate. There was little correlation between preference and the abundance of food that could be found in their natural habitat. Further research where food choices are narrowed down and the urchins were left for a longer period of time may help to yield stronger results.

(4) A Comprehensive Analysis of Parasite Load on Organ Mass of *Bufo terrestris*

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Parasites steal energy from their hosts, alter their hosts immune system, and damage their hosts health. The presence of parasites in the host may have a strong impact on the metabolically expensive organs (e.g. heart, fat bodies, and liver) and on the active immune response of a host due to redirection of host energy. Here, we investigated the relationship among parasite load, current immune system (spleen mass), host quality (mass of host body and fat bodies) and reproductive effort (gonad size and thumb pad size) in southern toads (*Bufo terrestris*; N = 39). We screened the gastrointestinal tract and lungs for parasites (e.g. nematodes) and quantified the abundance found in each organ type. Preliminary data analysis shows that there was no significance in the mass of the heart, liver, fat bodies, spleen, and testes due to parasite load.

(5) The effects of tourism on *Staphylococcus aureus* and MRSA prevalence in seawater at Clearwater Beach and Davis Island, FL

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It is speculated that with increased tourism comes increased microbial activity. For this experiment, *Staphylococcus epidermidis* and *aureus* were isolated from seawater samples, using water filtration, at two locations, tourist and non-tourist, on Clearwater Beach and Davis Island, FL. Clearwater Beach is a well-known tourist destination while Davis Island is a popular area for locals. Both locations were sampled at an area with heavy human activity and light human activity. Although part of the natural human fauna, *Staphylococcus aureus* can be pathogenic under the appropriate conditions. The resulting *Staphylococcus aureus* colonies were tested for oxacillin antibiotic resistance which is a method of identifying *Staphylococcus aureus* bacteria that are resistant to the -cillin antibiotic family. This includes the well-known methicillin-resistant *Staphylococcus aureus* strain (MRSA). The data was analyzed via an ANOVA and chi-square test. Results showed that the tourist locations contained more *Staphylococcus* species than the non-tourist locations. Additionally, the bacteria isolated from the tourist locations showed more antibiotic resistance than the non-tourist locations. Clearwater Beach and Davis Island are reputable for their sugary sands and emerald waters, but with the expected increases in tourism and associated MRSA levels, these paradises could soon become a threat to their visitors.

(6) Analysis of Male *Syngnathus scovelli* Fecundity by Season

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The Gulf pipefish (*S. scovelli*) is a species residing in most of the Gulf of Mexico, including the Tampa Bay region. In this species, males brood embryos in a pouch on their ventral surface, and breed year-round, except in the northern Gulf regions where their reproductive activity declines during winter. The goals of this research study were to identify patterns in male reproductive effort across seasons, identifying changes in offspring size and number, apparent mortality of offspring, and evidence of multiple aged offspring in male pouches. Male pipefish were collected from central Tampa Bay across seasons (2005-2010), where they were photographed ventrally. Photos were analyzed with the program ImageJ, where torso length (mm), pouch length (mm), pouch width (mm), pouch area (mm²), and the pouch reduction area (mm²) were measured. The number of embryos that males held, as well as the stage of pregnancy and if they were gravid, partially gravid, or not gravid at all were also recorded. During preliminary analysis, seasonal patterns were observed in both number of embryos and the amount of brood reduction. As a result, evidence suggests that sexual selection varies strongly with season in this species.

(7) The Presence of *Staphylococcus aureus* in Common Cosmetic Products

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Skin micro-flora protect our skin from invading pathogens. Most cosmetic products are widely used for skin care and appearance. They are susceptible to growth of *Staphylococcus aureus* due to contact with air, our skin, and the associated applicators. *S. aureus* is a part of our natural fauna and is considered an opportunistic pathogen; therefore, they are not dangerous to our wellbeing until they are present in optimal growth conditions. Our study tested common cosmetic products such as liquid foundation, concealer, and mascara for presence of *S. aureus*, prior to opening and after usage pre- and post-expiration of each product. Most products are packaged with antimicrobials and preservatives that are intended to inhibit bacterial growth. We tested for *S. aureus* growth in freshly opened products to measure the quality of packaging. For these measures, we swabbed each sample onto mannitol salt agar plates and quantified the growth of *S. aureus*. Our results will encourage users to take hygienic measures when applying makeup and bring awareness to prompt disposal of expired products.

(8) Instances of *Staphylococcus aureus* and MRSA on *Crassostrea virginica* in the Rivers and Bay of the Tampa Bay Watershed

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The objective of this experiment was to observe the different impacts bays and rivers have on the influence of pathogenic bacteria found in the water. The experimental design included testing Eastern oysters, *Crassostrea virginica*, because they filter water and can contain bacteria that is found in the water. Once it was detected whether the oysters contained *Staphylococcus aureus* or *S. epidermidis*, further research was conducted to investigate the presence of MRSA. Antibiotic resistance was tested on the culture found on the oysters that contained *S. aureus* to indicate the presence of MRSA. Antibiotic-resistant bacteria are a threat globally, and the goal of this experiment was to determine why different regions are at higher risk than others.

(9) Diversity of Epifauna on *Leptogorgia virgulata* in Tampa Bay, FL

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Gorgonian soft corals are frequently host to a large variety of epifauna. Gorgonians often produce anti-fouling compounds making it more difficult for sessile organisms to settle on them. Motile organisms, however, can live in high densities on sea whips. As the only soft coral present in Tampa Bay, *Leptogorgia virgulata* is likely to serve as an important host for many motile species. To describe the associated epifauna living on *L. virgulata* in Tampa Bay, whole specimens of *L. virgulata* and their associated epifaunal communities were collected on scuba from multiple sites within Tampa Bay. Specimens were preserved and then identified and sorted into taxonomic groups. The sea whips had a large epifaunal community including bivalves, caridean shrimp, brachyuran crabs, anomurans, and small crustaceans such as ostracods, copepods, and amphipods. For all sites there was no correlation between color of *L. virgulata* and total number of organisms or species diversity, as well as no correlation between site location and total number of organisms or species diversity. Larger sea whips tended to have more epifauna present. While it is clear that *L. virgulata* acts as a host for a number of species, the identity of these species varies between individual sea whips.

(10) Hygiene Practices in UT Bathrooms

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Many college students are unaware of the harmful bacteria that linger in public bathrooms. Further exacerbating the issue, hygiene measures are often not taken or not taken appropriately. A survey of 100 undergraduate students at University of Tampa analyzed both hygiene measures commonly taken when using public restrooms along with knowledge of bacterial risk. Samples were then taken from the most commonly used bathrooms on campus, focusing on areas where hygiene measures are able to be taken. Isolated colonies were grown and tested to discover the most common bacteria found on bathroom surfaces. Statistical analyses were run in order to correlate collective beliefs and common hygiene measure with the scientific data of growth and risk of bacteria in these restrooms. A disconnect was found between both knowledge of study participants and their corresponding hygienic behaviors and the level of bacterial growth found on the surfaces. The public health implication from this study is that better education is necessary to reduce the risk of bacterial related illnesses and infections in college students. This includes education on more effective hygienic behaviors as well as where the greatest risk lies in these public restrooms.

(11) Structural Mechanics of the Billfish Rostrum

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Billfish are large, fast pelagic predators characterized by an elongated upper jaw that forms a rostrum, or bill, which is hypothesized to be useful for defense, feeding, and hydrodynamic efficiency. The rostra of different billfishes vary considerably in their geometry, however, suggesting variation in function amongst billfish species. For example, swordfish rostra are dorsoventrally flattened, lenticular in cross section, and have sharp edges but no teeth, whereas *istiophorid* (e.g., marlins, spearfishes, and sailfishes) rostra are more circular in cross section and have teeth but no sharp edges. To determine the effect of rostrum geometry on mechanical function, CT scans of different billfishes were reconstructed and relative probabilities of failure via bending (i.e., second moment of area), twisting (i.e., polar moment of area), and buckling (i.e., radius of gyration) were analyzed using BoneJ. White marlin and swordfish have the highest resistance to bending in the lateral plane, suggesting high performance during lateral striking, while swordfish and sailfish have the highest resistance to bending in the vertical plane, suggesting high performance during vertical striking. White marlin and sailfish have the greatest resistance to twisting and buckling, suggesting that high performance in anteriorly-directed spearing of prey.

(12) Foraging Success of *Lagodon rhomboides* in varying seagrass densities

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Pinfish, *Lagodon rhomboides*, are an important omnivorous species in the seagrass bed habitat. Their success at feeding can have an effect on the biodiversity of the system. In seagrass beds, the density of blades can vary depending on location and environmental disturbances. This study aimed to analyze pinfish foraging success in different densities of artificial seagrass. Three aquaria habitats were created with no (0 blades/in²), low (~0.306 blades/in²), and high (~2.667 blades/in²) artificial seagrass densities. One pinfish, within a size range of 2-5 cm, was used for each observation trial of feeding behaviors. Foraging success on grass shrimp, *Palaemonetes pugio*, was measured in 10-minute trials. Increased seagrass densities, allowed prey items to hide more efficiently, decreasing the foraging success of pinfish. Aggressive feeding behaviors were observed most frequently in the no seagrass habitat and lowest in the high seagrass habitat. Juvenile pinfish may hunt more efficiently in lower seagrass densities but may reside in relatively dense seagrasses as the need for habitat to hide in during juvenile stages is significant as well.

(13) Courtship behavior and mate selection of *Hippocampus zosterae* in regards to relative coloration

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Seahorses have a reproductive lifestyle like few other fish. They are monogamous organisms that actively change colors in response to stress but also to signal when they are ready to copulate. Little research has been devoted to mate selection in the diminutive dwarf seahorse, *Hippocampus zosterae*. The process by which they select mates is unclear. This study focuses on the role of coloration in mate choice. Body measurements including standard length (mm) and weight (g) were also considered as variables influencing mate choice. Courtship behaviors were monitored daily and trials were concluded once a male became successfully pregnant, or after six days of no copulation. Dwarf seahorses were placed in tanks where a focal individual, male or female, was accompanied by two of the opposite sex with varying colorations. The findings of this experiment suggest that there is little to no correlation between coloration and mate choice and that standard length (mm) seems to have a larger influence on mate choice.

(14) Variation of Ligand Caps and Substituents of Tripodal CMPO-based Agents for f-Element Extraction

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Lanthanide (Ln) metals are the basis of current technologies due to their unique electronic and optical properties. Due to the inclusion of Lns in televisions, phones, and other high-tech devices, interest in lanthanide metals has grown significantly with regard to selective extraction of these metals from consumer products. Previous studies in our lab focused on lanthanide separations that utilized a carbamoylmethylphosphine oxide (CMPO) based ligand with a tripodal capping scaffold. The two caps that have been previously studied are tris(2-aminoethyl)amine (TREN) and tris(3-aminopropyl)amine (TRPN). The TREN-capped CMPO ligands demonstrated selectivity towards terbium and lanthanides in the middle of the series while the TRPN cap led to low lanthanide extraction across the entire series. In this study, we have continued to explore the effect of varying the ligand capping structure. Along with determining the effect of ligand cap variation on extraction behavior, we also report here the luminescence properties of this structure to gain insight into solution coordination chemistry. Results demonstrated that Thorium in a mixture of lanthanide metals was extracted selectively with a high extraction percentage for TRPN-CMPO-Ph, but a low percentage for lanthanide metals.

(15) Tampa Bay Community Cancer Network Experience- Colorectal Cancer Prevention

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Through an independent study with Tampa Bay Community Cancer Network, I was able to observe ethical public health research and outreach among at risk and medically underserved populations, develop a comprehensive understanding of community based participatory research and how it is applied, as well as assist with the drafting of a colorectal cancer (CRC) prevention related manuscript. Methods: Data was collected via a systematic literature review of peer reviewed journals, Screen to Save literature, NCI and CDC fact sheets, and the American Cancer Society publications. Results: In conjunction with the Blue Ribbon Panel CRC screening recommendations, the NCI Center to Reduce Cancer Health Disparities announced the launch of “Screen to Save” (S2S) in 2016. S2S aimed to reduce cancer health disparities by increasing CRC screening rates. Delivery of the FIT kit as an initial screening measure has been found to be highly effective in community settings and Federally Qualified Health Centers. Discussion: Linkages to care presented the greatest challenges in the study, as it was discovered that there was a need for tangible community health care partnerships in the target population to reduce structural barriers to care. Structural barriers include distance between service delivery, hours of service, complicated administrative procedures, and lack of transportation.

(16) Ybor City Sex and STD/STI Knowledge, Perceptions, and Behavior Project

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Background: Ybor City is known for “deviant behaviors,” including sexual liberation and binge drinking. This study aims to explore the relationships between knowledge and perceptions of STD/STIs and the sexual behavior patterns exhibited in the target population. Methods: This cross-sectional study recruited adults experiencing the Ybor City nightlife (n=122). Eligible participants completed a 13-item questionnaire. The survey was administered on weekend nights, between 9pm-Midnight. Descriptive statistics were performed on SPSS v24. Results: Study participants’ age was a mean of 27, with ages ranging 18-67. Preliminary results showed that only 20.7% of participants had been tested in the last 3 months, despite over half the participants having had unprotected sex in the last three months (52.9%). Half the participants did not take into consideration a partner’s most recent STD testing and sexual history when deciding to engage in sexual intercourse. Conclusions: Preliminary findings suggest a high risk in the area for STDs. Negative perceptions of STD testing, high level of barriers to testing, and low levels of sexual health education in this population may be contributing to risky behaviors. Findings from this research may reveal key points of intervention for neighborhoods with high prevalence of STD/STIs.

(17) Relationship Between Gut Microbiota and the Brain in Parkinson's Disease Patients

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Gut microbiota consists of countless microorganisms responsible for maintaining vital functions, such as regulating homeostasis and immunological function. It has been found that the state of one’s gut microbiota may also impact neurological function, specifically in patients with Parkinson’s disease. Parkinson’s disease is one of the most common neurodegenerative diseases in the United States and with these numbers rapidly growing, it is concerning to know that the cause for the non-familial form of this disease is unknown. A nonsystematic literature review was conducted using various databases including PubMed, ScienceDirect and Biological Abstract to determine the role of the relationship between gut microbiota and the brain in Parkinson’s disease. A dysregulation of the brain-gut-microbiota axis has been found in patients with Parkinson’s disease, leading to possible non motor symptoms and further progression of neurological symptoms. Non motor symptoms such as gastrointestinal inflammation has been found to impact the enteric nervous system, which is constantly in direct communication with the brain. While diagnostic symptoms are often classified by motor symptoms such as tremors, rigidity and bradykinesia, non motor symptoms often appear well before, leading to an earlier diagnosis. Further research must be conducted in order to develop solid conclusions.

(18) The Effects of Microplastics on Photosynthetic Rate of the Green Algae, *Ulva*

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One of the major environmental issues facing future generations is the problem with non-biodegradable plastic pollution, especially in the oceans. Plastic pollution affects not only people, but aquatic animals and plants as well. A layer of microplastics has developed in certain areas of the ocean which can act as a physical barrier against sunlight. This experiment will test if an increase in microplastic concentration will decrease the irradiance entering the water column and therefore decrease the photosynthetic rate of the marine green algae, *Ulva*. *Ulva* was suspended in a dissolved oxygen cuvette with varying concentrations of microplastic beads and photosynthetic rate (mg/L O₂/min) was measured as the rate of Oxygen (mg/L) production over time (min). If the experiment supports the hypothesis, the results should show a continuous decrease in Oxygen production as microplastic concentrations increase.

(19) The Effects of Nitrogen Pollution on Oysters Metabolic Rate

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Oyster beds play important roles in bay ecosystems. From providing habitats and food sources, to filter-feeding and cleaning the water, oysters help maintain homeostasis within a bay. Specifically, in Tampa Bay, where fertilizer runoff is prevalent, the oysters' ability to filter and purify the water is crucial. Fertilizer runoff significantly increases nitrogen levels in the bay, and it is important for the oysters to filter the nitrogen pollution out of the water. The purpose of this experiment is to understand the maximum amount of purification an oyster can undergo before it is negatively affected physiologically. To test this, three different concentrations of ground fertilizer will be dissolved in each tank: 700 ug/L, 1400 ug/L, and 2100 ug/L. It is predicted that a lower amount of dissolved fertilizer present in the tank will result in less stress on the oyster, allowing for a higher metabolic rate and, therefore, a higher filtration rate. The results of this study will show whether different amounts of fertilizer affect oysters' abilities to purify water. They will also provide an optimal amount of fertilizer that should be used in Tampa Bay to avoid harming local oyster beds.

(20) Concentrations of *Staphylococcus aureus* in the Hillsborough River

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Staphylococcus aureus naturally grows on the human body and will only become pathogenic in a suitable environment, known as an opportunistic pathogen. Incidences of *S. aureus* and Methicillin-resistant *Staphylococcus aureus*, or MRSA, have been increasing worldwide, causing the need for further research in human infections and if current laws are sufficient enough to protect the public. This experiment looked at concentrations of *S. aureus* along multiple locations in the Hillsborough River. The three collection sites consist of the river next to Glazer Children's Museum, the Riverwalk in downtown, and the convention center. It is assumed the highest concentrations of *S. aureus* occurred from the convention center location, due to its close proximity to Tampa General Hospital, and the large population of downtown residents and workers. Research has shown increased human activity leads to increased concentrations of *S. aureus* in surrounding areas and this experiment also suggested that.

(21) Feeding Behavior and Food Preference in two Tampa Bay Pipefish Species: the Gulf Pipefish (*Syngnathus scovelli*) and the Dusky Pipefish (*Syngnathus floridae*).

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Little is known about the feeding behaviors of pipefish, including the Tampa Bay species, gulf pipefish *Syngnathus scovelli* and dusky pipefish *Syngnathus floridae*. The purpose of our study was to observe behaviors and preferences when *S. scovelli* and *S. floridae* are exposed to different food sources. In our study, 17 *S. scovelli* and 21 *S. floridae* were exposed to *Palaeomonetes pugio* (parasitized with isopods and non-parasitized), frozen mysis shrimp, and live baby *S. scovelli* as food sources in different combinations. Three total phases were conducted, during each phase both species were exposed to two of the food sources and their behaviors were recorded. Based on our contingency table analyses comparing the phases, the two species of pipefish demonstrated differences in both feeding behavior and food preference. *S. scovelli* and *S. floridae* were more inclined to interact with non-parasitized *P. pugio* in all three phases, and few interactions with parasitized *P. pugio*, baby *S. scovelli*, and frozen mysis shrimp were observed. Studying feeding behaviors and preferences of pipefish is important in further understanding their effects and the role they play in their ecosystem as a predator, and to determine better ways to meet their dietary needs in captivity.

(22) Survival Rate of Gut Bacteria in *Varanus niloticus* After Being Frozen on a 15-year Interval

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Varanus niloticus, commonly known as the Nile monitor lizard, is an invasive species that has taken over the Florida wetlands. The gut microbiota of this species was chosen for the study because it is important to understand how the diet of this species affects its microbiome. Resources for this research project were donated by the University of Tampa's Ecology Laboratory run by Dr. Todd Campbell, who is looking at the reproductive cycle of these animals. The laboratory provided a good sample size of guts to track the survival rate of the monitor's microbiome post mortem after specific freezer time. Monitors from 1, 5, 10, and 15 years were test to determine which of the bacteria that survived were gram+ versus gram-.

(23) Nurse Residency Programs and the Effect on New-graduate Transition

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Nursing school curriculum strives to transform students into the ideal registered nurse, but when placed into the workforce, there is a lack of necessary experience, confidence, and knowledge while assuming the professional role. This study explores how graduate nurse residency programs affect new graduate nurses' transition into practice, the barriers of nationwide implementation of these programs, and evaluation of current residency programs strengths and weaknesses. Research articles were examined to create a comprehensive literature review and synthesis for this study. Utilizing the previous research findings and applying them to Benner's "Novice to Expert" Theory, this study exemplifies why these programs ease new graduate nurses' transition from student nurse into the role of a registered nurse. Barriers to implementation of new graduate nurse residency programs include initial startup cost, lack of knowledge regarding evidence-based research among stakeholders, and the delay of newly hired nurses into the field which impedes sustainable functionality of the units. Strategies discussed include education and identification of resources to aide in the implementation of these residency programs. This study explores the benefits of new graduate nurse residency programs which include increasing new graduate nurses' competency level, decreased new graduate nurse one-year turnover rates, and increase patient satisfaction.

(24) Physiological Response to Temperature in Leopard Gecko's, *Eublepharis macularius*, Metabolic Rates

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Leopard geckos, *Eublepharis macularius*, are nocturnal ectothermic reptiles. Variations in the environmental parameter, temperature, may elicit some physiological response from the leopard geckos. To quantify whether the variation in temperature influenced the physiology of the leopard geckos, their body mass and snout-vent length were measured. The Basal Metabolic Rate (BMR) and Specific Metabolic Rate (SMR) of the leopard geckos were calculated by measuring the rate of respiration at various temperatures. The predicted results are that BMR and SMR will increase as temperature increases, and the largest individual will have the highest BMR value.

(25) Assessment of Microbial presence on Waterpipe Tobacco Machines

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Water pipe tobacco smoking has become prevalent among adolescents and college students throughout the United States. Smoke travels down the stem through a water base, and out the mouthpiece, but lack of knowledge on the prevalence of microbial organisms on waterpipe tobacco machines has led to poor sanitation. Ten Hookah Bars were randomly selected in the Tampa Bay region. The mouthpiece, hose, and connector were swabbed and plated using 5% Sheep's Blood Agar, Chocolate Agar, and MacConkey agar. We hypothesize that microbial organisms would be present on the waterpipe tobacco machines. *Staphylococcus epidermis* has been identified on the connector apparatus. In addition to analysis of microbial organisms via plate growth and biochemical testing to determine organism viability, organism presence has been tested with TaqMan Assays for respiratory tract microbiota profiling. This method utilizes the TaqMan Array Card-format and detects 42 respiratory tract viral, bacterial, and fungal microbes. *Moraxella catarrhalis* and adenovirus were identified from the TaqMan Array Card. The identification of microbial species on waterpipe tobacco machines is a step toward creating effective laws towards the regulation and sanitation of shisha tobacco and waterpipe tobacco lounges.

(26) Carbon monoxide exposure in ambient air of Waterpipe Tobacco Lounges

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Waterpipe tobacco machines allow patrons to consume particulate matter and carbon monoxide. Carbon monoxide is inhaled and released into the ambient air of hookah lounges. Carbon monoxide (CO) has a higher binding affinity for hemoglobin compared to oxygen and high amounts of inhaled CO may lead to CO poisoning. Long-term tobacco smokers exposed to CO have been found to have increased cognitive impairment. Additionally, hookah patrons have been shown to have mean CO levels that increase from 6.5 ppm to 58.2 ppm before and after a session. In order to investigate CO levels contributing to both primary and secondary exposure, ten hookah bars were selected throughout the Tampa Bay area to measure ambient particulate matter and CO levels. Particulate matter measurements were assessed using a TSI SidePak AM510 Aerosol. Carbon monoxide measurements were assessed with a Digital Carbon Monoxide Detector. Measurements were taken in parts per million (ppm) and recorded in 5 minute intervals over a 4-hour period. Welch's ANOVA for both particulate matter and carbon monoxide showed significant differences among different hookah lounges in the Tampa Bay area. Additionally, values of CO in hookah lounges are ten to 20 times higher than CO values found in ambient air.

(27) Extracting and Assaying Natural Products from Marine Bacteria and Fungi

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Organisms can produce secondary metabolites as means of protection or possible communication. These metabolites, due to their unique structures, can be biologically active. After a host of extracts were collected from various marine macroorganisms, such as tunicates and sponges, and several bacterial cultures, the extracts were tested in a brine shrimp cytotoxicity assay. Extracts MANGO 1B04, with an effectiveness of 36.8%, Tunicate B DILD, with an effectiveness of 47.2%, and MANGO 1B07, with an effectiveness of 97.7%, showed significant activity in the assays. After the cytotoxicity assays, extracts of interest were run through LCMS to identify the specific compounds responsible for their activity. While MANGO 1B07 did not show any compounds of interest, extracts MANGO 1B04 and Tunicate B had compounds of interest. Further, Tunicate B and MANGO 1B04 were grown in two different media, Marine Broth and Magic Media, which appeared to induce different chemical pathways in the cultures. The next steps are to test the compounds of interest against MRSA and tuberculosis stand-ins to analyze for activity against disease-causing bacteria.

(28) Effects of Silver Nanoparticles on Human Umbilical Mesenchymal Stem Cells

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Silver nanoparticles are used widely in many industrial and commercial products as disinfectants, anti-microbials, food preservatives, surgical instruments, paints, and bandages. These silver nanoparticles (AgNPs) form pores in the membranes of bacteria and destroy them, thereby acting as anti-bacterial agents. At the same time, exposure of AgNPs to humans by inhalation, product applications (skin care) and may have some toxicological concerns. Here we used human umbilical cord mesenchymal stromal cells (hUMSCs) as a model system to access the toxicity of 5 nm AgNPs. The hUMSCs were exposed to various concentrations of AgNPs (1 ug/ml-100 ug/ml) at 24, 48 and 72 hrs and various assays were performed to evaluate its molecular effects. Differential interference contrast (DIC) images showed significant changes in cell morphology after 48 and 72 hrs showing AgNP interaction with the cells. There was a decrease in cell viability. We also observed early apoptosis in cells using annexin V as a biomarker. Cell cycle analysis showed that there were changes in G1, S and G2 stages at various concentrations of AgNPs. We aim to develop a panel of markers to apply these tools for toxicological evaluations of AgNPs and other nanoparticles using hUMSCs as a standard in-vitro model system.

(29) Millikan Oil Drop Experiment

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We attempted to quantize the value of the charge of the electron by performing an alternate version of the Millikan oil drop experiment. Looking into a microscope lens into the inside of a chamber, we observed droplets of oil falling down and rising up while being ionized and by making them go through a potential difference. The charge of the electron could then be determined based on the measured relative velocities induced by the electric force. Their total charge would have to be integral multiples of the fundamental charge in order to favor atomic theory. Our results produced an average value within 0.14% of the accepted value of the fundamental charge.

(30) An Investigation of the Genetic Diversity and Population Structure of an Isolated Bahamian Seahorse Population using Microsatellite Markers

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Speciation events are rare, often resulting from populations experiencing selection pressures from new environments or geographic isolation. The recent discovery of a seahorse population in an isolated Bahamian saltwater lake presented the opportunity to study the potential for speciation in this system. This population lacks gene flow with oceanic populations and may have relaxed selection pressures due to few predators and the no ocean currents. The goal for this project is to measure genetic diversity using microsatellite loci to identify any genetic structure within the six locations surveyed in the pond. Diversity in a population can be measured by determining the number heterozygotes present. In our preliminary results, heterozygosity within the population indicates that there is little inbreeding occurring, the repeated alleles across locations reveal that the populations are interacting with each other, and allele sizes can differentiate the *Hippocampus erectus* samples from other species. This data can be used to determine if they are a genetically distinct subpopulation compared with other members of their species, making them a discrete management unit from the perspective of conservation. The findings of this project will contribute towards the development of the Seahorse National Park at Sweetings Pond.

(31) Testing the Effectiveness of Natural and Synthetic Antibiotics on the Growth of Gram Positive and Gram Negative Bacteria

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An antibiotic is a drug that is used to inhibit the growth or kill bacteria. Synthetic antibiotics, usually chemically related to natural antibiotics, have since been produced that accomplish comparable tasks. However, with bacteria developing resistance to many antibiotics and the recent trend associated with anti-vaccinations, it is important to turn back to the fundamentals that once inspired the creation of many antibiotics. Determining the ability of a range of antibiotics to inhibit the growth or kill bacteria will be beneficial to the field of microbiology as we search for new ways to combat antibiotic resistance. This experiment was designed to test the effectiveness between natural and synthetic antibiotic options on gram positive and gram-negative bacteria. Antibiotics were tested after bacterial growth to compare to treating a patient who has already been infected and showing symptoms due to bacteria in log phase. This was done by growing *E. coli*, *S. aureus*, *K. pneumoniae*, and *B. subtilis* on nutrient agar plates, then placing antibiotic sensitivity discs on the plates after letting the bacteria grow on their plates for 24 hours. The zone of diameter was measured after 24 and 48 hours, and then compared within and among the treatments types.

(32) The Salinity Tolerance of The Invasive *Perna viridis* and The Native *Crassostrea virginica*

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Since being accidentally introduced into Tampa Bay in the Gulf of Mexico in 1999, the green mussel *Perna viridis*, a native to the Indo-Pacific region, has dispersed southwards along Florida. It is argued that the remarkable success of *P. viridis* as an invasive species stems from its long larval duration, fast growth rate, high fecundity, early maturity, high productivity and ability to withstand fluctuating environmental conditions. Green mussels have also been observed on oyster reefs within the bay and have contributed to the apparent displacement of the native oyster, *Crassostrea virginica*. This study investigated the salinity tolerance of both *Perna viridis* and *Crassostrea virginica* by exposing both species to concentrations of 15, 22, 29 and 36 ppt. The dissolved oxygen will be measured for both species at each salinity to determine stress levels of the organisms when placed in various salinities. It is expected that the dissolved oxygen concentrations will be higher in the water with *P. viridis* compared to *C. virginica*. This study will be beneficial in seeing how the invasive species *P. viridis* impacts the population of the native species *C. virginica* in Tampa Bay.

(33) Quantitative Analysis of CpG Methylation in the p73 promoter Region of Prostate Cells

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The p73 gene is a p53 tumor suppressor family member. CpG methylation at eukaryotic promoters is an epigenetic mechanism that establishes long-term gene silencing. We quantitatively determined the CpG methylation within the p73 promoter of three prostate cancer (PCa) cell lines (DU145, PC-3, LNCaP) and non-cancerous prostate cells using pyrosequencing. We identified differentially methylated regions (DMRs) of clustered CpG sites in the p73 promoter. From our pyrosequencing data, a discernable pattern of higher CpG methylation in PCa cells compared to the primary non-cancerous prostate cells was observed. Additionally, we identified a putative transcription factor (TF) binding sites within some DMRs using Eukaryotic Promoter Database. For future chromatin immunoprecipitation experiments, PCR primers were designed and optimized to amplify the DMRs containing putative TF-binding sites. PCR results are consistent with successful amplification of the target DMR promoter sequences using gDNA from LNCaP, PC-3, and primary non-cancerous prostate cells, but not for DU145.

(34) Structural Differences in Candidate Genes For Influencing Embryonic Diapause in Mustelids

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North American river otters (*Lontra canadensis*) undergo delayed implantation, in which the fertilized embryo sits dormant inside the uterus of the mother until approximately 40 days before the optimal birth season is anticipated, when it implants and begins to gestate. This species has the second largest latitudinal range of any Mustelid, from boreal Canada to southern Mexico, corresponding to broad dietary, physiological, and behavioral patterns. By contrast, it has restricted mating and birthing periods. This reproductive pattern fits the constraints of living in the far north, with a very short warm season, when it would be critically important to give birth and raise nurslings only during optimal weather. Embryonic diapause is widespread in the *Mustelidae*, but not found in some closely related mustelid species whose ranges are more extensive such as the Eurasian otter (*Lutra lutra*). We obtained 30X genomic libraries by paired-end IlluminaTM sequencing from the North American river otter, the Eurasian otter, the African clawless otter (*Aonyx capensis*), and a wild specimen of the American mink (*Neovison vison*). The African clawless otter does not undergo diapause, while mink undergoes a short diapause. We are in the process of generating 3D protein structures for candidate genes which we've chosen to be possible for influencing diapause. We compare some of these completed protein structures across our species to look for structural difference between diapausing and non-diapausing species.

(35) Analyzing Urban Habitat Variables and Lizard Communities in Urban Parks

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Urbanization is rapidly increasing, and it is vital to creating suitable habitats for wildlife within urban areas, such as urban parks and designated wildlife areas. In an arid environment like Phoenix, Arizona, riparian habitats are highly developed, so these ecosystems are especially important to conserve. Using visual encounter surveys in urban riparian forests in Phoenix, Arizona, we compared lizard richness, diversity, and abundance between the different areas. We also used USGS satellite data and GIS software to gather environmental variables such as vegetation index, temperature, and land cover type, to analyze which factors support stable lizard populations. We found that species abundances and richness significantly differed between the urban forests and across surrounding land cover types ($p < 0.05$), and that tree-associated lizards were more abundant in parks with higher vegetation indices ($p < 0.001$). As urbanization continues, we suggest prioritizing plant maintenance in order to maintain stable populations of lizards in urban settings.

(36) Vaccinating Tadpoles Against the Pathogenic Chytrid Fungus

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Batrachochytrium dendrobatidis (Bd) is an aquatic, highly contagious, pathogenic fungus that has caused massive amphibian extinction worldwide. Here, we studied whether we could induce acquired resistance to the fungus in Cuban treefrog tadpoles (*Osteopilus septentrionalis*). The tadpoles were dosed with one of the four treatments: (1) heat-killed zoospores and the metabolites they produced, (2) heat-killed zoospores alone, (3) Bd metabolites alone, and (4) an artificial spring water (ASW) control. We dosed frogs in each group with one of the vaccine treatments every day for two weeks, exposed them to the live Bd for two weeks, and then tested for Bd load using qPCR. Tadpoles exposed to treatments containing Bd metabolites had significantly less Bd than the unvaccinated control treatment ($p < 0.01$). These results suggest that vaccinating amphibians with Bd metabolites may induce acquired resistance to Bd even in the tadpole developmental stage. An effective Bd vaccine could protect endangered species of amphibians, increase frog populations in the wild, and allow for the reintroduction of wild extinct species.

(37) Bacterial Growth on Avocado Skins

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There has been controversy about washing fruits, specifically avocados. It is believed that it is fine to not wash avocados because of the fact that the skin of the avocado is not ingested. But, when you cut into the avocado without washing it, you are injecting the bacteria living on the skin into the edible part of the fruit. The purpose of this study was to explore what specific fecal coliforms (i.e., *E. coli*, *Salmonella*, and other *Enterobacteriaceae*) are present on the skin of avocados at local grocery stores. We swabbed the skin of avocados grown in different regions, and for the determination of *E. coli*, plated them on MAC plate, and mTEC plates. For the determination of *Salmonella*, we plated the swabs on SS plates. In addition, we plated swabs on NA plates to determine presence of other bacteria that are not fecal coliforms. Gram staining was used to determine the shape and if the bacteria were gram positive or negative. After conducting this research project and analyzing the growth on all plates, we concluded that consumers should always wash all of their fruits and vegetables, even when the skin of the fruit or vegetable is not ingested.

(38) Growth Rate of *Callinectes sapidus* when Exposed to Phosphate

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Blue crabs (*Callinectes sapidus*) are a commercially important species throughout the Western Atlantic Ocean and the Gulf of Mexico, including Tampa Bay, FL. Runoff from phosphate processing plants has been a large concern for organisms throughout the bay. This study investigated the effect of phosphate on the growth rate of *C. sapidus* found in Tampa Bay. Ten blue crabs were exposed to a 0.4 ppm phosphate concentration and compared to ten blue crabs that were not exposed to measurable phosphate. Over the course of two weeks, the crabs were weighed, measured, and photographed to determine growth rate and change in coloration. No significant difference was found between the growth rates of the two groups of crabs. There was no significant change in coloration of the crabs that would have indicated stress. Future studies will be conducted to determine whether higher phosphate concentrations may affect the growth rate of blue crabs over a longer time period and investigate impacts beyond increasing phosphate growth on the commercially important species.

(39) Diversity of Parasitic Infection in the Freshwater Snails *Melanoides tuberculata* and *Planorbella trivolvis*

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This study was accomplished by surveying different species of snails and determining the quantity of parasites and stage of life the parasites were in, in each snail we dissected. 45 snails were collected from the small stream in Plant Park of the species *Melanoides tuberculata* and *Planorbella trivolvis*. The snails were placed in a small insect terrarium with pond water, algae, and other vegetation for the snails to feed on. The snails dissected thus far had been parasitized, however majority of the parasites were in their last stage of development in the intermediate host before parasitizing the definitive host. There are no results as the experiment is still running, but what has been found so far are cercariae and metacercariae in large quantities, upwards of 200 in each snail, in the *Planorbella trivolvis* species specifically. The other species being dissected, *Melanoides tuberculata* has not shown consistent results, typically coming back with no parasites found. The ultimate goal of this study was to evaluate the quantity and diversity of parasites in different species of snails in the Plant Park stream. This study served to demonstrate that the ecology of aquatic snails plays an essential role in the development of trematodes.

(40) Physiological Differentiation Among Green Algal Turf Species on Soft Sediments in Mangrove Forests in Tampa Bay, FL.: A Case of Light Niche Partitioning?

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Mangals are highly productive coastal communities with essential ecosystem services such as shoreline stabilization and nursery habitat. Macroalgae in mangrove forests have been shown to contribute significantly to mangal primary production. Turf forming algae are found stabilizing the soft sediments under mangrove forests around the world and are locally abundant in Tampa Bay. A limited number of previous studies largely consist of species inventories or the occasional assessment of productivity of this community as a whole without the consideration of species-specific responses. This study was conducted to explore the possible physiological differences in algal species found in these turfs in Tampa Bay. Samples were randomly collected and analyzed for pigment concentrations, photosynthetic performance, and community composition. Regardless of sampling site, *Boodleopsis* dominated turfs were shade acclimated and *Chaetomorpha* dominated turfs were sun acclimated. This physiological performance appears to mirror the distribution of these algae in the mangrove understory indicating the potential for irradiance niches partitioning. In addition to light levels, each sampling site is exposed to diverse environmental conditions, such as sedimentation rate, desiccation, and seasonal effects. These factors will be analyzed in further experiments throughout the coming year.

(41) A Comprehensive Assessment of the Epidemiologic Implications of Periodontal Disease caused by *Porphyromonas gingivalis*

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Background: This epidemiology brief is about periodontitis caused by the gram negative anerobic bacteria, *Porphyromonas gingivalis*. Periodontitis is an advanced form of gingivitis, which is caused by an initial accumulation of plaque. Methods: The research for this paper is sourced by a systematic literature review across four databases: Pubmed, ScienceDirect, Gale Academic OneFile, and EbscoHost. Each article selected had to have been published in the last 10 years (2009-2019), and must be specific to the causative agent *P. gingivalis*. Results: The impact of *P. gingivalis* on human health is far more significant than the localized oral cavity. It can affect cardiovascular function, cause arthritic complications, and severe issues for AIDS patients. Therefore, it is important to reinforce education in patients early and to mitigate already existing cases in the population. Discussions: This is a prevalent bacterial strain and not extremely harmful with the appropriate measures in place. The key to preventing gingival, and subsequently periodontal, decay is to keep oral health as a priority. Public Health Implications: Safe oral hygiene practices need to be implemented worldwide. If nothing is done to address this, rates will continue to rise and chronic conditions in patients may potentially be exasperated.

(42) Temperature Sensitive Phenotypes in *Drosophila melanogaster* Fruit Flies

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Temperature-sensitive phenotypes occur during a change in conditions during the developmental processes in *Drosophila melanogaster* fruit flies. The apterous locus is located on the second chromosome of *D. melanogaster* and controls wing size. Wing size may range from normal size to one fourth the normal size and can have a range of effects on the morphology of the wing, such as notching, blistering, and marginal repetition on the tip of the wing. By determining the frequency in which this phenotype occurs in a stock of wild-type *D. melanogaster*, one may be able to determine the surviving ratio of these individuals in different environmental conditions where these organisms are normally found. *Drosophila melanogaster* specimens were exposed to various temperatures during development. Morphological changes were analyzed using the JEOL JMS-6010LA scanning electron microscope. Temperature increases during development resulted in slight notching on the posterior wing of one specimen incubated at room temperature.

(43) Resource Trade off: Parasite load vs Anoles Gonad Investment

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Animals have limited resources, and they must balance the energy they allocate to the pathogen defense (immune system), growth, and reproduction. Defense against parasites triggers the body's immune response which can be very energy taxing on the host. Similarly, reproduction is also an energy intensive process, but reproduction being the most important process evolutionarily we'd expect to see them put significant investment into their reproductive system. Here, we investigated whether there was a relationship among parasite load, host size metabolically expensive organs, and gonad investment. Green and brown anoles (*Anolis carolinensis* and *Anolis sagrei*; n = 22 and 22, respectively) were dissected. We recorded host body measurements (mass, snout-vent-length, tail-vent-length), metabolically expensive organ weights (heart, liver, and fat bodies), gonad tissue weights (testes), and gastrointestinal parasite load (counted and identified). The green anoles had significantly fewer parasites compared to the brown anoles. Preliminary data analysis found a positive relationship between gonad mass and parasite load. Possibly, anoles with a higher energy input into gonads have less energy for parasite defense. This indicates that the benefit of allocating energy into gonad investment outweighs the cost of a high parasite load.

(44) A Holistic Approach for the Treatment of Urinary Tract Infections

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Cranberry juice and tea tree oil has been thought to have antibacterial components that may help prevent or reject the attachment of bacteria in the urinary tract. The bacteria most commonly responsible for UTIs is *E. coli* and it comes from the rectum and enter the urethra. The use of cranberry juice or tea tree oil could be a more ecologically and financially efficient treatment for UTIs instead of antibiotics. UTIs are common amongst women, and constant use of antibiotics to treat UTIs increases the risk of creating antibiotic resistant microbes in your body. Due to the limited amounts of antibiotics available, increasing the risk of antibiotic resistance could be deadly. A lawn of *E. coli* was spread on a Mueller-Hinton agar plate. A disk of tetracycline, erythromycin, cranberry juice, and tea tree oil was placed on the Mueller-Hinton agar plate. This research was replicated and incubated at 37° C for 24 hours, and then the zone of inhibition was measured to see each disk's ability to fight against *E. coli*. If the zone of inhibition of cranberry juice or tea tree oil is equal to or larger than the antibiotics it will suggest reliable forms of treatment for UTIs.

(45) Efficacy of Toothpaste on Oral Flora

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Bad smelling breath is one minor issue we humans deal with, but oral hygiene is one of the most overlooked issues that us as a species must combat daily. Numerous different bacteria thrive in our mouths to make up our oral flora, but some organisms can cause illness or health complications due to overgrowth within the mouth. To prevent overgrowth, we utilize toothbrushes and toothpaste to keep our oral flora in check. To test the efficacy of the common toothbrush and toothpaste I used myself as the test subject. I kept my diet consistent by eating the same foods at the same times for 3 days, where I swabbed my own mouth each morning before brushing. After each initial swab, the left and right sides of my mouth were brushed with and without toothpaste respectively. Each swab was inoculated onto separate nutrient agar plates and allowed to grow for 24-hours. The data collected were the amount of colonies formed, where each colony had been gram stained and interpreted, then input to Excel for correlation and analysis. The lack of maintenance of our mouths have led to cavities and gum disease where people lose their ability to talk and even eat.

(46) Occupational Exposures to Hazardous Drugs and Safe Medication Handling Practices for Healthcare Professionals

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The purpose of this project is to provide a comprehensive review of the current hazardous medication handling practices, and to evaluate their effectiveness for reducing exposure risks for all healthcare workers. Researchers have identified risks associated with administering and transporting hazardous drugs, which include anti-neoplastics such as chemotherapy and biotherapy, immunosuppressants, and cytotoxic agents. Researchers have identified that these drugs are associated with adverse reproductive health outcomes, cancers, and chromosomal aberrations. However, uncertainty remains regarding the long-term effects of hazardous drugs because of the limited research available. Healthcare institutions, as a result, have implemented policies to protect workers from exposure; this includes the use personal protective equipment, decontamination practices, education, and hazardous drug transportation safety. Current research has attempted to evaluate the efficacy of the current safe-handling practices, however, more research must be conducted to determine the most effective preventative measures. Healthcare institutions can better enforce evidence-based practice recommendations to promote safety and health for employees handling these drugs. Based on the current literature, this research project integrates two conceptual frameworks: one provides recommendations as to how healthcare institutions can prevent occupational drug exposures; and the other incorporates Factors Predicting Use of Hazardous Drug Safe-Handling Precautions.

(47) The Impact of Dog Beaches on Nearby Human Recreational Beaches

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Fecal indicator bacteria (FIB) are used as a water quality indicator of recreational beaches. The U.S. Environmental Protection Agency (EPA) officials sample the water to minimize potential health implications. Infections from contaminated waters result in beach closures that lead in a great loss of revenue. Dogs—particularly their feces—are major contributors to the presence of FIB. We collected feces and water samples from Fort De Soto which has a dog beach down the block from a human recreational beach. Through source tracking, we hope to confirm that high levels of FIB in human recreational beach waters can be attributed to nearby dog beaches. We tested the resistance of the bacteria in the feces and water using 7 antibiotics: penicillin, ampicillin, oxacillin, vancomycin, tetracycline, cephalothin, and erythromycin. Testing antibiotic resistance is useful in minimizing the health problems to humans.

(48) Whale Shark (*Rhincodon typus*) Retinal Pigments and Visual Foraging Ecology

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Whale sharks are filter feeders that typically forage near the surface, but can also dive to depths greater than 1200 m, with speculations that these dives are associated with foraging. Aquatic rod visual pigments have adapted with regards to absorbance maximum to match the transmitted spectrum at foraging depth. The retinal pigment melanopsin controls the pupillary light reflex (PLR), which protects the retina from photobleaching. Previous studies have shown that the phosphorylation sites found in melanopsin's carboxyl-tail are responsible for deactivation kinetics, which control the rate of the PLR and pupil diameter under photopic conditions. Sequence analyses of the whale shark genome were performed to identify functional retinal opsins, as well as to characterize the spectral tuning properties and deactivation kinetics of whale shark rhodopsin and melanopsin, respectively. Our data shows that the whale sharks possess both a rod and a long-wavelength sensitive cone. The absorbance maximum of both the rod and cone pigments is estimated to be approximately 500 nm based on modeling of conserved amino acids in the opsin proteins. Deactivation rates of whale shark melanopsin are identical to mouse and are typical of a duplex retina.

(49) Influence of Assessment Features on Student Epistemology in Physics

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Assessment is a fundamental aspect of our educational system. We usually think of assessments as ways for instructors to get information about students. In this work, we flip this perspective and explore how assessments may give students information about instructors. Specifically, we consider how assessments may provide information about what faculty and researchers think it means to know and do physics, i.e. their epistemologies. Using data from students completing assessment questions during one-on-one think aloud interviews, we explored how assessment features impacted student engagement with the assignment. We analyzed video recordings and transcripts to infer the epistemological resources and framings students used while completing introductory-level physics problems. Students' framings tended to be fairly stable, but when shifts did occur - they were triggered by a shift in resource, which can be activated by assessment feature. This work extends existing work on epistemological framing into the realm of assessment and allows us to consider the effects of assessments on our students' understanding of physics teaching and learning.

(50) Testing the Limits: A Qualitative Perspective on the Effects of High Stakes Exams

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The purpose of this study is to explore the phenomenon of high-stakes testing from the perspective of the nursing faculty that administer the exams. This study will answer the following research question: “What is the meaning of high-stakes testing as it is experienced by the nursing professors that administer the exams?” Intending to achieve excellence and a high NCLEX passing rate, many nursing programs across the United States have used high stakes testing to evaluate a nursing student’s understanding and mastery of certain core concepts. Past research has shown how this test strategy affects the student population, but there is a lack research on the professor's experience. This study will be conducted using a qualitative, phenomenological in-depth interview methodology. A purposeful sample of ten full-time faculty members from a traditional Bachelor’s of Science in Nursing program will be recruited within 12 months of administering a high-stakes exam. Audio-taped in-depth individual interviews will be conducted and transcribed verbatim. Data collection and analysis will be performed concurrently. Thematic analysis will be utilized to create a rich narrative describing the phenomenon of high-stakes testing from the perspective of the nursing professors who administer the exams.

(51) Abundance and Occurrence of *Vibrio vulnificus* in the Hillsborough river in Tampa, FL in both seawater and *Crassostrea virginica*

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Vibrio vulnificus is a naturally occurring microorganism that is present in the marine environment. In high concentrations, this microorganism can be deadly to humans when they are exposed to wounds or consumed via raw shellfish. Hillsborough river in Tampa, FL presents optimal conditions for the microorganism to grow in stagnant, warm, highly saline waters. *V. vulnificus* can accumulate in the tissues of oysters (*Crassostrea virginica*) and other shellfish, due to their method of filter feeding. The aim of this study is to confirm and quantify abundance of *V. vulnificus* in *C. virginica* and water in Hillsborough river. Oysters and water samples were collected from five different sites in Hillsborough river and *V. vulnificus* was isolated by plating them on thiosulfate-citrate-bile salts-sucrose (TCBS) agar. Environmental parameters were taken into account to compare among sites. By determining abundance of *V. vulnificus* in Hillsborough river in both water and oysters the public can become better educated on the harmful bacterium and more precautionary measures can be taken into account.

(52) Fecal Coliforms on Organic and Non-organic Produce in Supermarkets

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Millions of people in the United States suffer from foodborne illnesses every year. The prevalence of these illnesses due to fresh produce has become a growing public concern. Contamination from water sources, soil, harvesting, and distribution all contribute to microorganisms growing and thriving on fresh produce. Since there is an increasing trend in healthy living styles, the consumption of organic over non-organic produce has recently increased. The different growing processes of these two types of produce can lead to different microorganism faunas. Identifying the harmful microorganisms on different types of fresh produce would increase the chance of controlling and preventing foodborne illnesses. Ten common types of fresh produce were swabbed for fecal coliforms and tested on MacConkey agar, Salmonella/Shigella agar, and EMB agar. Knowing the types of microorganisms present on produce will provide the ability to prevent harmful outbreaks that cause millions of foodborne illnesses every year.

(53) Using traditional mark-recapture techniques to “ground-truth” the use of natural facial patterns in an endemic seahorse population from the Bahamas (*Hippocampus erectus*)

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In this study, we assessed using both traditional mark-recapture and facial recognition techniques to follow a saltwater lake population of lined seahorses (*Hippocampus erectus*). The first phase of this project used both tags and facial patterns analyzed with the Interactive Individual Identification (I3S) program to confirm that facial markings work to identify individuals. A 25x25 meter grid system was established in both the north and south ends of the lake, with animals photographed and physically marked in August, and then resampled in November, December and March, photographing all animals and marking unmarked animals. Closed population estimation techniques were used to calculate the density of animals at the two locations and were compared to direct density measures of animals in the grid. The southern population (0.065 seahorses m⁻²) was significantly smaller than the northern population (0.14 seahorses m⁻²) when measured directly, with estimations based on mark recapture 341% higher in the south and 825% higher in the northern populations. Analysis is ongoing to test the feasibility of using images instead of direct marking procedures, in addition to analyzing the growth of animals recaptured in the system.

(54) Fashion Icons of the Sea: How Decoration Rates of the Spider Crab, *Libinia dubia*, Differ in Varying Structured Habitats and in the Presence of Predator Cues

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Camouflage is one of the most interesting survival tactics in the animal world, commonly observed in a variety of ecosystems. *Libinia dubia*, a species of spider crab, is well-known for their interesting decorating behavior. These crabs utilize an array of materials found in their environment, in which they attach these items to their carapace to blend into their habitat. It is difficult to pinpoint the exact conditions under which they decorate and the extent to which they decorate. In this study, the effect of the type of habitat they are placed in and the presence of predators was evaluated. Preference of natural or artificial decoration material was also investigated. Analysis suggested that the type of habitat nor the presence of chemical cues from their common predator, pinfish, have a significant effect on decoration rate. However, decorator crabs do have a preference for natural material over artificial material. These results suggest that the decorating behavior of *Libinia dubia* is more complex than hypothesized and could be due to a combination of factors working in tandem, rather than one specific element on its own. A larger sample size and a longer observation period may help to clarify and strengthen these results.

(55) The Effect of Stressors on Equine Fecal Microbiota Composition

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The microbiota present in the equine body play a major role in the overall health of the animal. Sudden changes in the composition of microbiota can leave the animal susceptible to ulcers, colic, and other detrimental medical disorders. This study was conducted to classify the fecal microbiota composition present in a healthy horse, and to determine the effect of the stressors on equine fecal microbiota composition. Data for this study was collected using the CAB Direct database, to collect papers that aligned with the desired parameters. Data was then placed into an organized database where it was statistically analyzed to determine the effect of travel, anesthesia, diet, exercise and antimicrobial drugs on the microbiota species composition compared to that of a healthy horse.

(56) Prodigiosin: Pigment Extraction from *S. marcescens* for Cosmetic Application

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Serratia marcescens is a gram-negative rod-shaped bacterium commonly found in soil and water. Although having pathogenic effects on humans, this bacteria harbors an extraordinary talent. *S. marcescens* produces a pigment known as Prodigiosin, which has many factors that can be used as a substitute for synthetic products in the cosmetic industry. A literature review was conducted through several databases analyzing if Prodigiosin could be extracted for cosmetic purposes. Additionally, an investigation was completed on the toxicity of other red pigments, naturally and synthetic, that are commonly found in cosmetics.

(57) Abundance Analysis of Tabby's Star (KIC 8462852)

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KIC~8462852 is a star of interest due to it's unusual flux phenomena. Although there is now a better understanding of the star's photometric fluctuations, the star has of yet been fully characterized. Our research focuses on determining the chemical composition of KIC~8462852. Here we present our analysis of medium-resolution spectra obtained with the 3.5-m WIYN telescope and HYDRA spectrograph in single-object mode to determine the star's chemical abundance. We have used the MOOG spectral analysis software and KURUCZ model atmospheres to determine abundances via spectral synthesis.

(58) An Investigation into Band Iridescence of Female Pipefish

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Gulf Pipefish, *Syngnathus scovelli*, exhibit male pregnancy and a sex-role-reversed mating system in which the females produce eggs that are housed by males, meaning it is the females who must compete for their mates. Females are larger than males and possess iridescent banding patterns on their torso to signify sexual maturity. The Iridescence Detection and Isolation Algorithm (IDIA) program was designed to isolate the iridescent signal into a false color image which can then be measured. In order to test the effectiveness of this program, the iridescence of bands was quantified on females from four different geographic locations along the Gulf of Mexico to measure variation within and across populations. The greatest difference in band iridescence was observed between the two Texas populations, with one having higher iridescence than both Florida populations and the other with the lowest of all four locations. The population that demonstrated the most variation was collected in south Florida while Texas females had little variation in iridescence. Future paths include an investigation into the diversity of iridescent patterns on female pipefish collected throughout the Tampa Bay area while also investigating the development of male iridescence due to coastal contamination.

(59) A Comparison of Phototactic Behavior in Photosynthetic and Non-Photosynthetic Sacoglossan Sea Slugs

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Sacoglossan sea slugs are a group of herbivorous marine gastropods. Several species of sacoglossan engage in kleptoplasty, the process of sequestering chloroplasts stolen from algae inside of the slug's own cells in order to photosynthesize. Because they gain energy from sunlight through photosynthesis it is expected that photosynthetic slug species will spend more time in direct light than non-photosynthetic species. To test this, phototactic experiments were conducted on two species of long term photosynthetic sacoglossans, including one Caribbean species, and four species of non-photosynthetic Caribbean sacoglossans. The photosynthetic species were significantly more likely to spend time in the light, suggesting that photosynthesis provides a strong incentive for light exposure despite potential risks of predation. On the contrary, non-photosynthetic species either prefer shade or do not exhibit strong phototactic behavior. Examining differences between these two groups of slugs provides valuable insight into the impact that the evolutionary novelty of kleptoplasty has on the ecology and behavior of these animals.

(60) Theoretical Adsorption of Lactic Acid Through Benchmark Metal-Organic Frameworks

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Metal-organic frameworks (MOFs) are an emerging class of porous crystalline materials that show promise for a variety of applications, including gas storage and separations, catalysis, sensing, and drug delivery. Lactic acid is a chemical that proliferates in the body after excess strain on the muscles. Strategies that reduce the buildup of lactic acid in the human body following strenuous exercise are desirable. Due to their ability to work as delivery systems, a number of different MOFs were theoretically investigated for their potential to adsorb lactic acid. Periodic density functional theory (DFT) calculations were performed for a lactic acid molecule confined within the pores of selected benchmark MOFs. The optimal location of lactic acid within these MOFs was determined through such quantum mechanical calculations. The adsorption energy (ΔE) was then calculated for each MOF-lactic acid system to determine which material exhibits the greatest interaction with lactic acid, and therefore show promise for capturing these chemicals. This study provides computational insights into possibly using MOFs to remove unwanted lactic acid in the human body.

(61) Effects of Repeated Low-Stakes Assessments on Students' Test-Anxiety, Attitude, Self-Concept, and Achievement in a Non-Science Majors Chemistry Course

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Test anxiety is a major roadblock to successful performance. It is an unpleasant feeling associated with worry, insecurity, and self-doubt. Studies have shown when these anxiety feelings compete with the working memory, the working memory is disrupted and performance on the exam may consequently suffer. This study looks at studying interventions for mitigating test-anxiety, specifically for students with high test-anxiety. Students will be identified via cluster analysis of several previously identified affective characteristics. One way to mitigate test anxiety is to present multiple low-stake assessments in the form of quizzes throughout the semester. This will not only provide students with numerous opportunities to practice and develop test-taking skills but may help alleviate test-anxiety as students get more comfortable with the idea of testing. In addition, this study will investigate how repeated quizzing influences students' attitudes, self-concepts, and self-efficacy throughout the course. The results of this study will provide instructors with knowledge on how to identify and reach out to highly test-anxious students early on in the semester.

(62) Common Microbial Communities in the Kitchen and the Most Effective Antimicrobial Agent

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Food borne illnesses are often caused by microorganisms but can be prevented with efficient cleaning. There is debate as to what is the most competent cleaner regarding microorganisms naturally found on kitchen surfaces. The purpose of this experiment was to compare three household products, bleach, Lysol, and thieves essential oil, on the microbial communities found in kitchens. Microorganisms were cultured from two public and two private kitchen surfaces. Colonies were identified using gram staining, MacConkey agar, and TSI slants. Twenty randomly selected colonies were analyzed on Mueller-Hinton plates using the Kirby Bauer method with efficacy being measured by the size of the zone of inhibition. All plates were treated with one drop of each cleaning solution prepared according to manufacturer's protocol. Bleach had the largest zone of inhibition suggesting it to be the most effective antimicrobial agent of the microorganisms commonly found in kitchens. However, cleaning is an important part of personal health and using an effectual antimicrobial agent is crucial.

(63) Generating a Model of Human Obesity in *Danio rerio*

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Copy number variants have previously been associated with obesity linked diseases such as NAFLD and Type 2 diabetes. However, obesity has never been investigated as a potential cause of copy number variant formation. *Danio rerio* (zebrafish) were used to generate a model of human obesity. Seventy-percent of zebrafish genes are similar to human genes with 84% of disease associated genes being present in zebrafish. Over the span of 6-8 weeks, zebrafish were fed an excessive diet of artemia to induce obesity, while control fish were fed normal diets. After the 6-8-week period, the zebrafish were sacrificed and DNA and RNA were extracted from liver and whole body samples. BMI data showed significant differences between experimental and control groups. The differences between the experimental and control group could also be seen by visual examination of the specimens. The confirmation of obesity in the experimental group was carried out by qRT PCR for genes known to be associated with obesity in liver, while oil red staining was used to confirm the increase in lipocytes in the experimental group. Future studies will utilize this obesity model to determine somatic CNV formation and the ability of these CNVs to affect gene expression.

(64) Stomach Content Analysis of *Cichlasoma urophthalmus* (Mayan Cichlid) in the Tampa Bay Watershed

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Throughout their native range in Central America, Mayan Cichlids (*Cichlasoma urophthalmus*) have been documented to have a generalist diet of mainly fishes and invertebrates, along with plant material. In the Everglades ecosystem, invasive populations of Mayan Cichlids also displayed an omnivorous diet. Little is known about the ecology of Mayan Cichlids in the fresh and brackish water habitats in Tampa Bay. During the summer and fall of 2018, adult and juvenile Mayan Cichlids were collected via hook-and-line with artificial lures or with cast nets in the Hillsborough River and Little Manatee River. Fish were fixed in 10% formalin, dissected, and stomach contents were sorted and preserved in 70% ethanol. After sorting, stomach contents were identified to the lowest taxonomic level possible and an Index of Relative Importance (IRI) was calculated for each taxon. Currently, the highest IRI values calculated for stomach contents of Mayan Cichlids collected in Tampa Bay were associated with gastropod mollusks. Future work will include additional field collections from more sites and a larger number of fish collected. It is hoped that sufficient samples will be collected of juvenile and adult Mayan Cichlids that any ontogenetic shifts in their trophic ecology in Tampa Bay will be identified.

(65) Carbazole Derivatives as Photocatalysts for the Dehalogenation of Substituted Benzenes

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Photoredox catalysis offers new ways to achieve radical reactions under mild conditions by utilizing nontoxic light-sensitive alternatives to radical promoting reagents. Carbazoles (nitrogen-containing heterocycles) have potential as organic photoredox catalysts due to their high excited state reduction potentials and high oxidation potential to regenerate the catalyst compared to commercial equivalents. Carbazoles are also easily derivatized, so use of high-powered mercury lamps can be avoided by increasing their conjugation which allows them to absorb longer wavelengths. Current research includes the dehalogenation of substituted benzenes using carbazole derivatives with increased conjugation in catalytic amounts and 365 nm irradiation. We have shown carbazole derivatives have successfully converted 4-chlorobenzonitrile to benzonitrile with 90% yield using diisopropylethylamine as a hydrogen donor. Future plans include expanding the application of carbazoles as photocatalysts to other redox reactions such as building new carbon-carbon bonds.



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