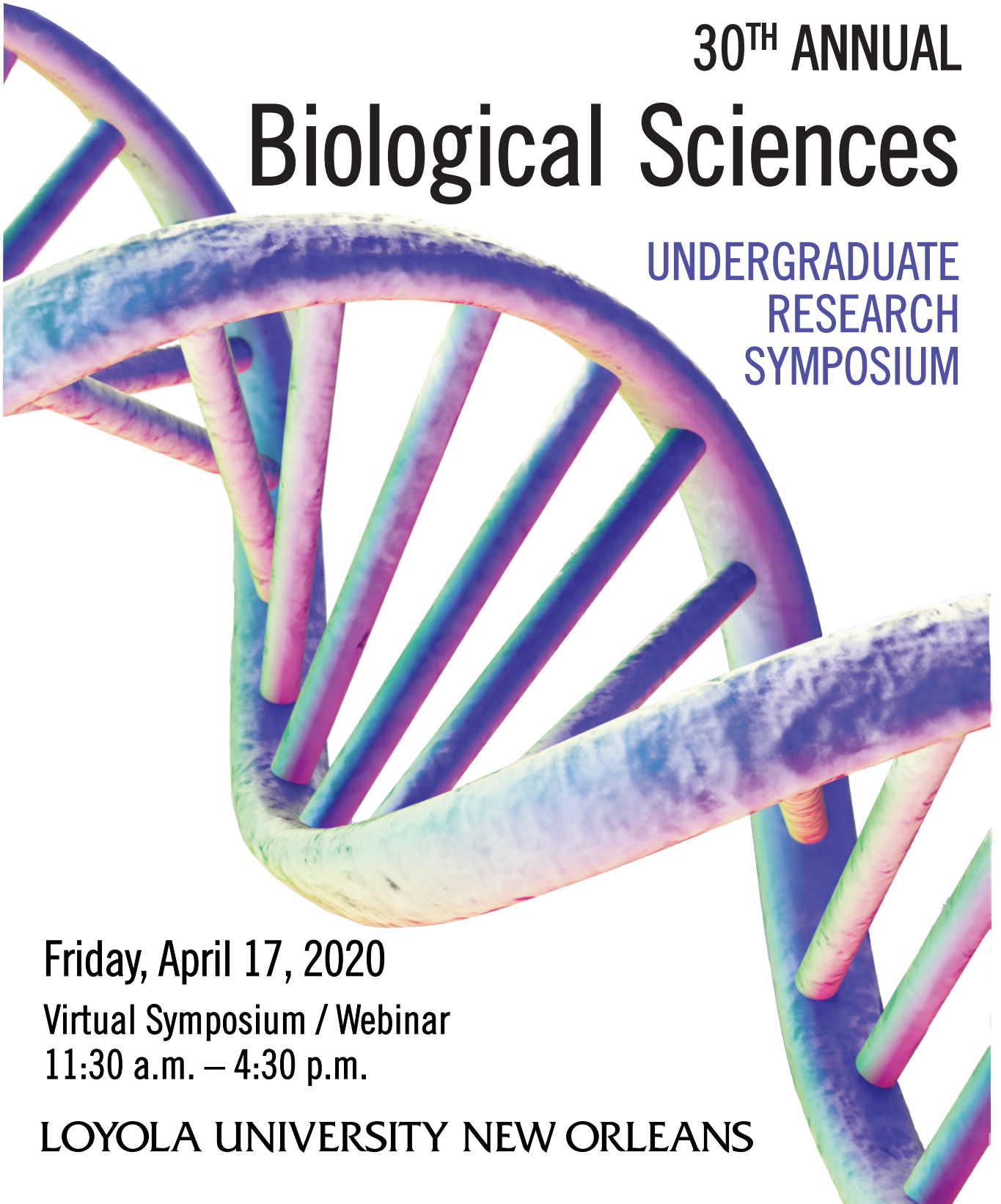

30TH ANNUAL

Biological Sciences

UNDERGRADUATE RESEARCH SYMPOSIUM

Friday, April 17, 2020

Virtual Symposium / Webinar
11:30 a.m. – 4:30 p.m.

LOYOLA UNIVERSITY NEW ORLEANS

30TH ANNUAL
Biological Sciences
UNDERGRADUATE RESEARCH SYMPOSIUM

11:30	OPENING REMARKS		
11:45	Mariana Kendall	Dr. Aimée Thomas	2,4-D or 2,4-Don't? The effects of 2,4-D on aquatic macroinvertebrate communities.
12:00	Kyle Whitfield	Dr. Phil Bucolo	Effects of water hyacinth (*Eichhornia crassipes*) and herbicide 2,4-D on algal communities.
12:15	Dahlia Martinez	Dr. Frank Jordan	Discovery, abundance, and distribution of Asian swamp eels in Bayou St. John.
12:30	Coleman Green	Dr. Armin Kargol	The effect of geometry on macroscopic quantum coherence in light-harvesting nanotubular complexes.
12:45	Ariel Hall	Dr. Armin Kargol	Exploring the effects of nanoparticle exposure on voltage-gated ion channels in HEK cells.
1:00	Alexys Wright	Dr. Rosalie Anderson	Joint regeneration and the expression of tissue-specific markers in the chicken embryo.
1:15	15 MINUTE BREAK		
1:30	Joussette Alvarado	Dr. Jovanny Zabaleta Dr. Rosalie Anderson	Molecular profiling of racial and ethnic minorities with breast and colorectal cancer.
1:45	Jared Chan	Dr. Phil Bucolo	Quantifying primary productivity of subtidal riverene microenvironments exposed to varying light regimes.
2:00	Addison Ellis	Dr. Phil Bucolo	Mud crab feeding preference between invasive *Myriophyllum spicatum* and native *Ceratophyllum demersum*.
2:15	Sidney Williams	Dr. Phil Bucolo	Effect of silicate concentrations on diatom *Skeletonema costatum* in a defined media.
2:30	Sofia Giordano	Dr. Aimée Thomas	Quantifying microplastics in the Pacific Ocean and Gulf of Mexico.
2:45	Katie Rompf	Dr. Aimée Thomas	Natural history and cannibalism in *Latrodectus geometricus* spiders.

3:00	15 MINUTE BREAK		
3:15	Abigail Perez John Tarpey	Dr. Patricia Dorn	*De novo* assembly and analysis of the *Triatoma mopan* transcriptome.
3:30	John Tarpey	Dr. Yvonne-Marie Linton Dr. Patricia Dorn	A biosurveillance of Ugandan ticks and pathogens.
3:45	Razan Badr	Dr. Yvonne-Marie Linton Dr. Patricia Dorn	Biosurveillance of ticks and associated pathogens in Belize.
4:00	Chloe Dupleix	Dr. Patricia Dorn Dr. Aimée Thomas	DNA barcoding for assessment of wolf spider diversity in New Orleans.
4:15	Johnathan Baudoin	Dr. Liz Simon Dr. Rosalie Anderson	Improved methodologies to resolve telomere length quantification in HIV-infected individuals.

2,4-D OR 2,4-DON'T? THE EFFECTS OF 2,4-D ON AQUATIC MACROINVERTEBRATE COMMUNITIES.

MARIANA KENDALL
STUDENT PRESENTER

DR. AIMÉE THOMAS
RESEARCH ADVISOR

Water hyacinth is an invasive aquatic plant that poses a threat to southeast Louisiana wetlands, disrupting hydrology and displacing native flora and fauna. In New Orleans City Park, the herbicide 2,4-D is sprayed aerially on hyacinth to control its spread. We are interested in the effects of the toxin on the aquatic macroinvertebrate community that uses the hyacinth roots as a novel habitat and alterations to lagoon water quality. Aquatic macroinvertebrates serve several important ecological roles as detritivores, predators, and food for larger aquatic life. Without their presence, the aquatic ecosystem would collapse. Therefore, we measured the water chemistry and macroinvertebrate community with and without the herbicide. Water chemistry data revealed a change in the level of nitrate, phosphate, ammonia, and dissolved oxygen, which may affect macroinvertebrate populations. Aquatic macroinvertebrates have a range of water quality that each species can tolerate, and any alteration to the water quality, like adding 2,4-D, results in a change in the species diversity. Data suggest spraying water hyacinth with 2,4-D negatively impacts the aquatic macroinvertebrate community, since fewer aquatic macroinvertebrates have been found in treatments with 2,4-D than in treatments without. Spraying water hyacinth with 2,4-D negatively impacts the aquatic macroinvertebrate community that use the roots as a novel habitat.

EFFECTS OF WATER HYACINTH (*EICHORNIA CRASSIPES*) AND HERBICIDE 2,4-D ON ALGAL COMMUNITIES

KYLE WHITFIELD
STUDENT PRESENTER

DR. PHIL BUCOLO
RESEARCH ADVISOR

Eichhornia crassipes (water hyacinth) is an invasive floating angiosperm proliferating and altering hydrology throughout wetlands of South Louisiana. The herbicide 2-4, D is often deployed directly to dermal tissue of *E. crassipes* to induce senescence leading to decomposition of the plant. In order to investigate the effects on ecosystems dynamics due to presences of *E. crassipes*, as well as the effects of plants treated with 2-4, D, a mesocosm experiment commenced over six weeks where changes in water quality and alteration to phytoplankton and epiphytic communities were quantified weekly. Multivariate analysis of variance testing weekly effects on water quality due to presence and absence of the plant as well as herbicide treatment illustrated that the presence of *E. crassipes* treated with 2-4, D was significantly detrimental to dissolved oxygen (D.O.) concentration and induced hypoxia. The presence of herbicide free *E. crassipes* did not result in hypoxia after six weeks. Algal community dynamics fluctuated only slightly across treatments and were not significantly affected by *E. crassipes* presence or herbicide treatment. Water quality results show that the decomposition of herbicide treated *E. crassipes* can lead to hypoxic events and therefore removal efforts of treated plants should be considered during wetland management initiatives.

DISCOVERY, ABUNDANCE, AND DISTRIBUTION OF ASIAN SWAMP EELS IN BAYOU ST. JOHN

DAHLIA MARTINEZ AND **VICTORIA RODRIQUEZ**
STUDENT PRESENTER

DR. FRANK JORDAN
RESEARCH ADVISOR

Cuchia (*Monopterus cuchia*) is a species of swamp eel native to Asia that was discovered in Bayou St. John in June of 2019. We followed up on this discovery by using complementary sampling methods to assess the abundance and distribution of Cuchia throughout Bayou St. John and adjacent waterways. These methods included throw traps, minnow traps, leaf packs, dip nets, and seines. Cuchia were limited to a roughly 2-km stretch of Bayou St. John. We collected three age classes including young-of-year, indicating a reproducing population has been established in Bayou St. John for at least a year. This may be the first reproducing population of Cuchia to be established in the United States. Cuchia inhabited densely vegetated littoral habitats along with a number of other native and non-native estuarine fishes and macroinvertebrates. Establishment of Cuchia is of concern because they are opportunistic predators, obligate air-breathers, tolerant of a wide range of salinities, resistant to ichthyocides, fossorial, and capable of moving across land. More importantly, this species could spread widely because Bayou St. John is hydrologically connected to the vast Mississippi River drainage and coastal wetlands along the Gulf of Mexico. Monitoring the distribution and abundance of Cuchia and assessing their ecological effects will be an ongoing project over the next few years.

THE EFFECT OF GEOMETRY ON MACROSCOPIC QUANTUM COHERENCE IN LIGHT-HARVESTING NANOTUBULAR COMPLEXES.

COLEMAN GREEN
STUDENT PRESENTER

DR. ARMIN KARGOL
RESEARCH ADVISOR

We study nanotubular self-aggregates of chlorophyll molecules, which are essential for light harvesting and energy transport in photosynthesizing Green Sulphur Bacteria. If these structures are well understood, then we can potentially replicate them in labs and create efficient photoreceptors. A quantum mechanical model of a mutant variety of Green Sulphur Bacteria (Mutant Type) has shown that these structures, which are stacks of rings of 60 photoactive molecules with large transition dipoles, support quantum coherences at room temperature. Consequently, photoexcitations can be delocalized over many molecules. This leads to the emergence of superradiant states, which absorb and emit light at much faster rates than a single molecule. However, the strength of these effects depends on the geometric arrangement of these structures. To further study the role of geometry, we changed parameters, such as the orientation of the dipoles, and compared the results to the original structure. We found that photoexcitonic delocalization is sensitive to these changes. We then created an entirely new model based around the golden mean (Golden Mean Type) and showed that it also supports superradiant states. Lastly, we studied a model with entirely random positions for the molecules and showed that these quantum effects disappear. So, an open question is to understand the relationship between delocalization and dipole strength. In the future we hope to answer this question by studying the geometries that optimize these effects.

EXPLORING THE EFFECTS OF NANOPARTICLES EXPOSURE ON VOLTAGE-GATED ION CHANNELS IN HEK CELLS

ARIEL HALL
STUDENT PRESENTER

DR. ARMIN KARGOL
RESEARCH ADVISOR

Voltage-gated ion channels are largely responsible for transportation of various ions across the cell membrane, causing changes in cell potential and stimulating processes like the firing of neurons or contraction of muscle cells. Barium titanium oxide (BTO) nanoparticles have been suggested as a possible mechanism to control channel gating. In this study, the properties of voltage-gated potassium channels in the cell membranes of HEK cells were studied in relation to addition of BTO nanoparticles. Trials were conducted over short-term periods and long-term periods with polarized and non-polarized nanoparticles of concentrations of 0.05 mM or 0.4 mM. In short-term trials, nanoparticles were added at intervals of 2, 5, 10, and 15 minutes before cells were patch-clamped on an automatic patch-clamping rig. In long-term trials, cells were incubated with nanoparticles for 24 hours before being patch-clamped on a manual patch-clamping rig. In both short-term and long-term trials, control and experimental cells were exposed to two experimental protocols (IV and Tails), during which the cell membranes were depolarized and repolarized by applying appropriate voltage. Current and voltage through the cell membrane were recorded for each cell, and graphs of current vs. voltage and conductance vs. voltage were created on MATLAB using these data. Analysis of these graphs revealed that nanoparticles do not appear to negatively affect the current passing through ion channels; however, further research is required to ensure that nanoparticles are harmless to ion channels. Altogether, these results allow for the exploration of nanoparticles as a mechanism to control ion channel gating.

JOINT REGENERATION AND THE EXPRESSION OF TISSUE-SPECIFIC MARKERS IN THE CHICKEN EMBRYO

ALEXYS WRIGHT
STUDENT PRESENTER

DR. ROSALIE ANDERSON
RESEARCH ADVISOR

Synovial joints are one of the most important structures in anatomical studies because of their vital role in complex human motor abilities. Research related to the development of synovial joints is relevant to understanding joint regeneration and degenerative joint diseases, such as arthritis, within the human population. The synovial joint is significant to the movement of forearm and upper arm muscles and requires a synovial membrane and fluid, muscles, tendons, and ligaments to properly execute motion. While the function of these joints is essential, little is known about regenerating these joints. The goal of this study is to analyze the development and regeneration of a synovial joint, specifically the elbow, using chicken embryos. A "window excision" technique was utilized to investigate regeneration. Joint regeneration is documented with the examination of the skeletal structure and surrounding supporting structures (muscle, tendons, and ligaments). For analysis, an antibody against sarcomeric myosin was used (immunohistochemistry) to distinguish skeletal muscle development, and a riboprobe for *scleraxis*, a transcription factor, was used (*in situ* hybridization) to distinguish tendon and ligament development. Mallory's trichrome staining method was used to analyze the entire anatomy of the joint. This analysis showed similar organization and patterning of five of the major elbow muscles and their tendon and ligament insertions between experimental and control wings.

MOLECULAR PROFILING OF RACIAL AND ETHNIC MINORITIES WITH BREAST AND COLORECTAL CANCER

JOUSSETTE ALVARADO
STUDENT PRESENTER

DR. JOVANNY ZABALETA
LOUISIANA STATE UNIVERSITY HEALTH SCIENCES CENTER RESEARCH ADVISOR

DR. ROSALIE ANDERSON
RESEARCH ADVISOR

Health disparities are the preventable, differential burden of a disease, injury, and lack of opportunities to attain peak health experienced by those who are socially disadvantaged. Contributing circumstances include socioeconomic factors, gender differences, and racial and ethnic minority status. Our research focused on racial and ethnic minority health disparities. Our first study centered on luminal B breast cancer. Breast cancer is the second-leading cause of cancer-related death in women; however, there is a lack of breast cancer studies showing differential gene expression in minorities. Previous studies from the lab have shown differences in gene expression according to ancestry in Hispanic/Latina women with breast cancer. The goal of our study was to determine the differential gene expression patterns between European, African, and Native ancestries of Hispanic/Latina women with luminal B breast cancer. Our second study focused on colorectal cancer. Colorectal cancer (CRC) is one of the leading causes of cancer-related deaths worldwide for both genders, but the prevalence of the disease in the U.S. is disproportionately higher in African Americans than in Caucasian individuals. Inflammation is considered a hallmark of cancer. The activity of inflammatory cells may lead not only to genetic instability but also to adverse mechanisms such as tissue remodeling, angiogenesis, and treatment resistance. Recent data suggest a differential role played by immune cells in the development of CRC. Understanding how these cells are differentially associated with immune surveillance and how they can be modified to enhance future therapies is essential to reduce CRC disparities.

QUANTIFYING PRIMARY PRODUCTIVITY OF SUBTIDAL RIVERINE MICROENVIRONMENTS EXPOSED TO VARYING LIGHT REGIMES

JARED CHAN
STUDENT PRESENTER

DR. PHIL BUCOLO
RESEARCH ADVISOR

Primary production has been found to drive energy allocation and increase biodiversity in riverine riparian subtidal communities. Availability of sunlight is essential to photosynthesis and subsequent primary production which provides energy for the food webs via carbon fixation. Excessive overgrowth of riparian canopy had inhibited available sunlight in Turkey Creek (Niceville FL), a part of the watershed home to threatened fish *Etheostoma okalossae* (Okaloosa darter). We hypothesized that increasing light availability by removing canopy cover and exposing eight 20 m sites to sunlight would significantly increase primary production across autotrophic microenvironments and submerged macrophytes. Primary production quantified by dissolved oxygen evolution rates converted to carbon fixation (mg C • m-2 • hr-1) was significantly greater in open canopy sites compared to controls with typical canopy cover. Specifically, biofilms dominated by rhodophyte *Batrachospermum* sp. and the sediment associated microalgal communities showed statistically greater gross primary production than control sites where canopy cover remained. Two populations of aquatic plants were also more productive in open canopy sites. Submerged aquatic plant populations and algal biofilms were also significantly more abundant in removed versus closed canopy sites. We conclude that increased light availability promotes growth of subtidal communities and increases primary production in subtidal autotrophic macrophytes and microenvironments.

MUD CRAB FEEDING PREFERENCE BETWEEN INVASIVE *MYRIOPHYLLUM SPICATUM* AND NATIVE *CERATOPHYLLUM DEMERSUM*.

ADDISON ELLIS
STUDENT PRESENTER

DR. PHIL BUCOLO
RESEARCH SPONSOR

The spread of invasive aquatic macrophyte species into brackish and freshwater wetlands increases the possibility of disturbances to local ecology in terms of survival and proliferation of native macrophyte and invertebrate communities. Submerged aquatic vegetation (SAV) play a crucial role in the propagation of invertebrates and ecosystem complexity. The submerged aquatic macrophyte *Myriophyllum spicatum*, commonly known as the Eurasian milfoil, is a worldwide invader present in over 400 estuaries in North America. Currently, there are few studies elucidating the effects of the rapid introduction of this non-native species on the diets of primary and secondary consumers, which is imperative for interpretation of the complex interactions of aquatic invaders and native communities. We collected the invasive *M. spicatum* and a native SAV species *Ceratophyllum demersum* from Marquez Canal, located off Chef Menteur Pass, Southeast Louisiana. Within the same watershed, *Rhithropanopeus harrisii*, the North American mud crab, has been found in high volumes interspersed under both species' canopies. In order to compare palatability of both the native and invasive macrophyte to the mud crab, we collected *R. harrissi* via throw trap sampling. Replicate choice feeding assays comparing the palatability of *M. spicatum* to *C. demersum* were conducted and compared to autogenic controls. Results of three replicate choice feeding assays illustrated palatability of both the invasive species *M. spicatum* and native *C. demersum* to *R. harrissi*. Analysis of variance, throughout all assays, showed no significant differences between rates of consumption by the crab on either plant.

EFFECT OF SILICATE CONCENTRATIONS ON DIATOM *SKELETONEMA COSTATUM* IN A DEFINED MEDIA

SIDNEY WILLIAMS
STUDENT PRESENTER

DR. PHIL BUCOLO
RESEARCH ADVISOR

Nutrient rich media has long been used for algal culture growth experiments. However, nutrient rich media typically does not reflect nutrient or subsequent ionic proportions present in aquatic systems. To accurately understand the growth and responses of cultured microbes during culture investigations, media should reflect the compounds available in the system as opposed to nutrient enrichment. Construction of a culture media that emulates precise ionic proportions associated with nutrients of Lake Pontchartrain Basin watershed, referred to as Lake Pontchartrain Media (LPM), was created as an alternative to the standard f/2 nutrient rich media. However, the original LPM recipe did not include silicate (SiO3) critical for diatom population physiology. In order to test whether the LPM is a viable option for diatom culturing investigations, three different concentrations of silicate were added to the LPM recipe and growth rates of the diatom *Skeltonema costatum* were quantified via absorbance changes at 730 nm over 9 days. Populations increased with each silicate addition, but were statistically greater in the highest concentration treatment addition, 1 mL SiO3 * 1 L LPM-1. Populations of diatoms in universally deployed, nutrient rich f/2 media reached carrying capacity after nine days whereas LPM + SiO3 treatments continued in log phase growth. This investigation confirmed that media constructed from specific nutrient regimes is a viable media option moving forward. The difference in responses from cells cultured in nutrient rich f/2 versus LPM highlights that a paradigm shift is warranted for algal culture investigations.

QUANTIFYING MICROPLASTICS IN THE PACIFIC OCEAN AND GULF OF MEXICO

SOFIA GIORDANO
STUDENT PRESENTER

DR. AIMÉE THOMAS
RESEARCH ADVISOR

Microplastics are pieces of plastic less than 5mm and their presence in water contributes to the overall water quality. In the Pacific Ocean, there is a widely known area referred to as the Great Pacific Garbage Patch, which is a collection of debris that has gathered into an area as a result of currents. Both bodies of water are home to a popular oil industry, whose activity may be contributing to the amount of microplastics found. Commercial fishing is also a popular industry, and not only have fishing lines been found in waters globally, but fish in a plastic-polluted area will ingest plastics, and thus ultimately be ingested by humans. It is important to study plastic in water to gain knowledge on the effects humans have on the environment. This is a growing epidemic, in 2015 alone, 380 million tons of plastic was produced, yet research studies are limited. This research project quantified the amount of microplastics found within a portion of the Gulf of Mexico and Pacific Ocean. Data collected from the Pacific contained 0.05 microplastics/mL and Gulf contained 0.01 microplastics/mL on average. This research should contribute to baseline microplastic data and raise awareness of the amount of plastic pollution in the Pacific and Gulf of Mexico as well as the potential dangers to human health, including the potential ingestion of plastic, the effects of which are still unknown.

NATURAL HISTORY AND CANNIBALISM IN *LATRODECTUS GEOMETRICUS* SPIDERS.

KATIE ROMPF
STUDENT PRESENTER

DR. AIMÉE THOMAS
RESEARCH ADVISOR

The brown widow spider, *Latrodectus geometricus*, is native to South Africa, but due to recent human dispersal over the past few decades, they are now found on every continent except Antarctica. Within the past 10 to 15 years, they have come to thrive in the southeastern United States, including Louisiana (as posted: www.inaturalist.org). In New Orleans, Louisiana, within the past 10 years, local experts have observed a dramatic increase in abundance of brown widows while the native black widow, *L. mactans*, has declined considerably. Studies of brown widow life-history traits are limited. To better understand the natural history of brown widows in urban locales in New Orleans, I collected 150 egg sacs and 25 adults. We recorded and measured developmental parameters daily. Additionally, we bred virgin females with males raised from previously collected gravid females, allowing us to make observations regarding courtship and cannibalistic behaviors of their offspring. These observations lead to our research studying the effect of temperature on rates of siblicide due to cannibalism. This work provides an increased understanding of this invasive species by providing new natural history information, a means of comparison to native black widows, and allows further exploration of the potential ecological implications of brown widows' ever-increasing abundance in urban New Orleans.

DE NOVO ASSEMBLY AND ANALYSIS OF THE *TRIATOMA MOPAN* TRANSCRIPTOME

ABIGAIL PEREZ AND **JOHN TARPEY**
STUDENT PRESENTER

DR. PATRICIA DORN
RESEARCH ADVISOR

Classified as one of the 17 neglected tropical diseases by the World Health Organization, Chagas disease or American Trypanosomiasis, is a leading cause of heart disease in Latin America. *Trypanosoma cruzi*, the causative agent of Chagas disease is estimated to infect about 6 million people worldwide, and is passed in the feces of kissing bugs, also known as triatomines. Roughly 30% of those who are infected die of heart disease after decades with the parasite without even realizing they are infected. Control is difficult due to a lack of understanding of their metabolic pathways, and morphological similarities among members of the complex, resulting in taxonomic challenges. Bioinformatics allows for analysis of large and complex biological data sets, uncovering findings that would not otherwise be possible. In this study, we assembled the first combined *de novo* transcriptome for the newly-described *Triatoma mopan* species to reveal metabolic pathways that can be for control and to resolve taxonomic challenges. We then annotated the transcriptome to identify the expressed genes in the organism, and further classified the genes through Gene Ontology. Our data provides the first assembled and comprehensive transcriptomic data for this newly described species, *T. mopan*, and also demonstrates effective implementation of RNA sequencing and *de novo* transcriptome assembly and analysis for a species that lacks published genomic information.

A BIOSURVEILLANCE OF UGANDAN TICKS AND PATHOGENS

JOHN TARPEY
STUDENT PRESENTER

DR. YVONNE-MARIE LINTON
SMITHSONIAN INSTITUTION RESEARCH ADVISOR

DR. PATRICIA DORN
RESEARCH ADVISOR

Very little is known about the distribution patterns of ticks and tick-borne pathogens in Uganda, Africa, which is cause for concern as the area is endemic to many vector based diseases with serious public health implications. In January and February of 2019, 398 Ticks were collected in Uganda from cows, pigs, goats, dogs, and sheep by our colleagues, and were sent to the Walter Reed Biosystematics Unit for processing. Here we used molecular genetics approaches to identify 276 ticks to 11 species through DNA barcoding and screened for pathogens using PCR with genus-specific primers. We definitively identified three pathogen species infecting 22 ticks, also collected partial sequences from many other pathogens, indicating a higher percentage of infected ticks than we could confirm. This pathogen presence indicates a risk for tick-borne illnesses in residents, travelers, and livestock in Uganda. This preliminary study gave us a glimpse into the diversity of Ugandan tick and pathogen populations and their potential dangers which had not been fully investigated before. In the future, more surveys must be conducted to develop a better understanding of the species in this region and the risks they pose. This knowledge can provide insight into an effective tick management and disease control program for endemic areas.

BIOSURVEILLANCE OF TICKS AND ASSOCIATED PATHOGENS IN BELIZE

RAZAN BADR
STUDENT PRESENTER

JOHN TARPEY
CO-AUTHOR

DR. YVONNE-MARIE LINTON
SMITHSONIAN INSTITUTION RESEARCH ADVISOR

DR. PATRICIA DORN
RESEARCH ADVISOR

Belize is a tropical country hosting a rich biodiversity and diverse landscapes, ranging from lowlands and swamps in the north to rainforests and mountainous regions in the south. It is also training grounds for U.S. soldiers. Ticks can carry and transmit dangerous pathogens that put both local residents and soldiers at-risk. Herein we compare 564 ticks collected in Red Bank and San Roman villages in the SE district of Stann Creek in 2018 with those collected in 2014 and 2015 from Cayo (SW), Orange Walk (NW), and Corozal (N) Districts (n = 154). Ticks were primarily collected off local dogs, with a few samples collected from horses and by environmental dragging. DNA was extracted from 564 ticks and DNA barcodes successfully obtained from 417 confirming the presence of 10 taxa: *Amblyomma auricularium, A. coelebs, A. imitator, A. maculatum, A. nr oblongoguttatum, A. ovale, A. sp. nr ovale, A. tapirellum, Dermacentor nitens, Rhipicephalus sanguineus*. Differences in tick species recovered across the four districts sampled to date were detected. All 564 ticks were also screened for R*ickettsia spp., Babesia spp., Babesia microti, Borrelia spp.,* and *Ehrlichia spp*. All positive amplicons were sequenced, and resultant sequences were molecularly identified using GenBank. Seven ticks were found to be infected: six by *Rickettsia parkeri* (*A. ovale* (n=5), 1 unidentified) and one by *Ehrlichia canis* (specimen unidentified), all in San Roman village. It is important to understand the connections between vectors and the pathogens they may carry to work towards preventative measures and improving healthcare.

DNA BARCODING FOR ASSESSMENT OF WOLF SPIDER DIVERSITY IN NEW ORLEANS

CHLOE DUPLEIX
STUDENT PRESENTER

DR. PATRICIA DORN AND **DR. AIMÉE THOMAS**
RESEARCH ADVISOR

DNA barcoding is a taxonomic method used to identify and distinguish animal species by the sequence of a 650 base pair segment of the cytochrome oxidase (COI) gene and sometimes the 16S rRNA gene. Both genes are found in mitochondrial DNA, and the sequence obtained is most useful at the subspecies level. DNA barcoding is important and useful when identifying spider species because spiders can be small and thus difficult to categorize. Secondly, the primary technique for spider identification is through morphological distinction of the genitalia of sexually mature spiders, thus making accurate identifications impossible for juveniles. We studied 20 juvenile and sexually mature spiders in the family Lycosidae to generate identifying barcodes for these spiders. We used three different primer sets to amplify the COI gene and the 16S rRNA gene. The primer sets were LCO-1490 & HCO-700ME, LCO-1490 & HCO-2198, LR-J-13017 & LR-N-1339. These combinations were selected because of their ability to successfully amplify spider DNA according to published literature. Barcodes that successfully distinguish Lycosidae species will be presented.

IMPROVED METHODOLOGIES TO RESOLVE TELOMERE LENGTH QUANTIFICATION IN HIV-INFECTED INDIVIDUALS

JOHNATHAN BAUDOIN
STUDENT PRESENTER

DR. LIZ SIMON
LOUISIANA STATE UNIVERSITY HEALTH SCIENCES CENTER RESEARCH ADVISOR

DR. ROSALIE ANDERSON
RESEARCH SPONSOR

With the effects on aging being one of the big health concerns in our country, one of the factors that does not get taken into consideration are our telomeres. Telomeres are molecular regions at the end of a chromosome, with its job being to protect our chromosomes from falling apart. It is known that continual shortening of telomeres can lead to adverse cellular and molecular changes, including cellular senescence, apoptosis, or oncogene transformation. Also, diseases may have a part in telomere shortening as well. Our research currently involves improving current methods regarding the use of RT-qPCR to quantify telomere length in HIV-Infected individuals. Furthermore, we will delve into the sorting of immune cell populations, with a goal of determining whether individuals with HIV show a decrease in telomere length.

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Today we celebrate the 30th year of this annual, seminal event at Loyola where students from biology and other natural sciences present their undergraduate research projects. These outstanding students have enhanced their undergraduate experiences by taking on directed research and creative activity under the supervision and mentorship of some of Loyola's most distinguished faculty as well as faculty from partner institutions.

If you are attending this event as a student, we hope you will be inspired to develop your own research or creative projects. We invite you to visit our website at **loyno.edu/biology** to learn about the many ways undergraduates can get involved with research here at Loyola. For more information about contributing to undergraduate research experiences, please contact Karen E. Anklam, Major Gifts Officer, Development/Capital Campaigns Department at **(504) 861-5423** or **keanklam@loyno.edu**.

SPECIAL THANKS

We would like to offer out special thanks to our donors for their continued support of this event through the Rev. J. H. Mullahy Undergraduate Research Fund, Biology Gift Fund, and the Dr. Jean DeKernion Undergraduate Research Fund.

GUEST SYMPOSIUM EVALUATORS

Claire Commagere, Jeff Hobden, Jensen Tran, Kayla Noto

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