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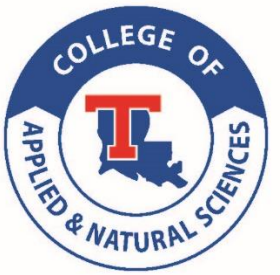

College of Applied and Natural Sciences
ANS Day & ANS Research Symposium
Louisiana Tech University Student Center

April 13, 2023

Innovative Instruction Projects

Poster #13

Promoting Newborn Safety through Campus Simulation

Denise Pyles, Tanya Sims, Mary Wilson
Division of Nursing

Faculty in Nursing 210, Maternal Newborn Health Maintenance, strives to promote student immersion in clinical simulation to promote clinical reasoning and safe patient care. Faculty identified a need to expand simulation activities to focus on newborn safety. An Innovative Instruction grant funded by the College of Applied and Natural Sciences enhanced simulation with newborn mannequins and resources. This equipment will benefit the creative teaching environment and enhance the sense of realism, so students are more prepared in the hospital setting. In addition, newborn mannequins of differing skin tones will increase diversity and inclusion in the simulation experience. Students will experience a greater sense of realism to enhance preparation for actual newborn care in an enhanced simulation environment. Students will be able to utilize newborn models and resources for service-learning projects in the community to promote safe sleep education, swaddling practices, newborn fall prevention, and shaken baby syndrome education. Students will have access to culturally diverse newborn mannequins during small simulation group settings, classroom demonstrations, service learning, and other teaching endeavors included in Nursing 210. The benefits of simulation help train students to address the challenges in today's healthcare and effectively improves patient outcomes, bring clinical reality closer to the student, and help to incorporate evidence-based research into practice.

Poster #31

Soil your Undies: A Measure of Soil Health and Organic Matter Decomposition

Ryan Embry, William Patterson

School of Agricultural Sciences and Forestry

Organic matter decomposition is a key component for healthy soils. Land use, pore space, water content and movement, aeration, soil chemistry, and organisms and their activity affect organic matter decomposition. To assess soil organic matter decomposition rate in the Louisiana Tech University Arboretum, cotton underwear was buried at a 6-10 cm depth on September 8, 2022 at two locations 115 feet from each other on a Sacul soil: an open grass field and a mature loblolly pine forest. The underwear was uncovered on November 16, 2022. At that time, soil cores from 0-10 cm depth were collected and processed to calculate bulk density, percent pore space, percent moisture content by volume, and air volume percent. Infiltration rate was also measured then. After 10 weeks of burial, the underwear under the forest soil had lost 9.62% of its original weight, whereas the underwear under the open grass field had only lost 0.44% of its weight. Soils at the open grass field had higher bulk density, lower pore space, higher moisture content by volume, and lower air volume than at the forest. The infiltration rate (water movement through the surface soil) and the percolation rate (water movement through the subsoil) at the open field was much lower than that of the forest. The open field location is eroded, compacted, and more poorly aerated, with slower water movement than the soil at the forest location. These factors affect the activity of organisms that decay organic matter and slowed the decomposition of the underwear in the open grass field. The forest location has healthier soil than that of the open field location. Future plans include replicating to six locations, burying during spring and summer, using Berlese Funnel to assess arthropod numbers and diversity, measuring respiration, and assessing effect of soil chemistry on biological processes.

Research Projects

Poster #1

Developing a Method to Detect Microplastic Ingestion by Louisiana Waterfowl

Katie Redman[1], Taylor Carnes [2], Terri J. Maness[1]
[1]*School of Agricultural Sciences and Forestry*
[2] *School of Biological Sciences*

It is estimated that 5-13 million tons of plastic are discharged from the land into aquatic environments annually. This poses a persistent global pollution problem and is an emerging threat to wildlife and human health. Our goal is to investigate microplastic ingestion by waterfowl in Louisiana. The Gulf of Mexico has some of the highest reported concentrations of microplastics globally and is home to the majority of plastic manufacturers in the United States. To investigate microplastic ingestion in waterfowl, we needed to develop a method that was efficient while also minimizing the risk of contamination. Our waterfowl samples were donated to us by area hunters. Preliminary methods included dissection and thorough rinsing of GI contents through sieves which isolated microplastic-sized particles (1-5mm). Following this process, samples were examined under a microscope. Because waterfowl ingest grit to aid in digestion, it was difficult to differentiate between grit and microplastics. In addition, ingested plant and insect material can be confused with plastic particles. To better understand the amount and types of microplastics that Louisiana's waterfowl ingest, we added two steps that have increased efficiency while also limiting the risk of contamination. Currently, we digest the GI tract in a 10% KOH solution to rid the samples of all biological matter. We also added a density separation step that allows us to distinguish grit from microplastics. Adoption of this method has allowed us to efficiently examine the number and variety of microplastics in Louisiana's waterfowl while maintaining low levels of contamination.

Poster #2

Bacteriophage Lambda Integrase Can Recombine att-like Sequences from the Human Genome

Joe D. Williams [1], Yuri Voziyanov [2]
[1]*Computer Science*
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Bacteriophage lambda integrase Int – a founding member of the tyrosine family of site-specific DNA recombinases – can perform a full spectrum of genome rearrangement reactions: integration, deletion, inversion, and replacement of DNA fragments which makes Int an attractive candidate as a genome editing tool. Genome editing field, which is currently dominated by the CRISPR/Cas9 system, requires that sequence specificity of the DNA manipulation tools is easily modified to target different genome sequences. However, sequence specificity of DNA recombinases cannot be easily modified which impedes the use of these enzymes in the genome editing applications. The requirements of the field can be nevertheless satisfied if the exceptionally high level of sequence specificity of the tyrosine recombinases is lowered while preserving their gene editing functionality. Consequently, the recombinase variants with the relaxed target specificity will acquire the ability to recombine the genome sequences that resemble the wild-type recognition sequences for these DNA recombinases. The main goal of our present research was to identify the genome 'target-like' sequences for Int recombinase (att-like sequences) in the vicinity of the human beta- globin gene that can be recombined by a relaxed specificity variant of Int. We used bioinformatics approaches to locate such sequences and showed that about half of them can be successfully recombined by the Int variant in bacterial cells. Further research in human cells will determine if the recombinationally active att-like sequences can be used to replace defective DNA sequences in the beta-globin locus of the human genome.

Poster #3

Newly Discovered Population of Southern Red-backed Salamanders Greatly Expands the Distribution of a Major Evolutionary Lineage

Jasmine Lindsay, Makenzie Meacham, Donald B. Shepard
School of Biological Sciences

Accurate knowledge of species distributions is necessary for ecological and evolutionary research as well as conservation. Due to the cryptic nature of salamanders, our understanding of their geographic ranges is constantly being refined. Southern Red-backed Salamanders (Plethodon serratus) are distributed in four disjunct areas in the eastern United States and exhibit a high level of genetic diversity within the Ouachita Mountains of Arkansas and Oklahoma. Five major genetic lineages have been described in the Ouachita Mountains, each one occupying a distinct geographic area. In November 2022, we collected two P. serratus from a new locality, Poteau Mountain in LeFlore County, Oklahoma, expanding the known geographic distribution of this species. The closest reported locality to this new record is 23 km away and belongs to the Northwestern Ouachita lineage so we hypothesized that individuals from our newly discovered population would group with that clade in genetic analyses. We extracted DNA from both individuals, amplified the mitochondrial Cytochrome b gene using Polymerase Chain Reaction, and sent products off for sequencing. Contrary to our hypothesis, phylogenetic analysis revealed that both individuals from the new population grouped with the Eastern Ouachita clade. The closest locality for other members of the Eastern Ouachita clade is ~100 km away, resulting in a large and irregular distribution for this major evolutionary lineage. Our findings provide further insight into the biogeography and evolutionary history of P. serratus. Based on our results, distribution maps should be updated and conservation plans should consider patterns of genetic diversity within the species.

Poster #4

Fabrication and Characterization of a Stretchable Sodium Alginate Hydrogel Patch Incorporated with Silicon Nitride and Metalized Halloysite Nanotube to Develop Chronic Wound Healing Treatment

Femi Alakija, David K. Mills
School of Biological Sciences

It is known that the human body is a responsive healing machine, but sometimes bones break when an accident happens, and some never heal. Current treatments for wounds are painfully inadequate. The present study describes the fabrication and characterization of a nanocomposite hydrogel patch incorporated with silicon nitride and metalized halloysite nanotubes (HNT). The electrodeposition process was done to coat Magnesium oxide (MgO) on HNT and viewed with SEM. Material characterization was done to determine how the material's structure and properties would impact wound healing. It was discovered that the nanocomposite hydrogel patch possesses inherent antimicrobial properties when tested against E. coli and S. aureus, and it aids the migration and proliferation of cells. The nanocomposite hydrogel patch also shows a constant drug release during the drug release study. Materials involved in the fabrication process help in the swelling properties by which the nanocomposite hydrogel patch has approximately 400% of its initial weight discovered during the swelling test. The fabricated nanocomposite hydrogels use properties for wound healing such as antimicrobial, tensile strength, better-swelling properties, drug release capability, enhanced cell proliferation, and non-toxic to cells.

Poster #5

Plant-based Lentil Burgers Exceed the Nutrient Quality of American Classic Hamburgers

Savannah Davis-Smiley, Gabby Trejo, Catherine Fontenot
School of Human Ecology

Cardiovascular Disease has been the leading cause of death among US adults since 1950. A low-fat, vegetarian diet has shown reversal of atherosclerotic plaque development. The purpose of this study was to assess consumer overall acceptability and nutritional content of a traditional hamburger using ingredients that were plant-based. Appearance, texture, flavor and overall acceptability were assessed by panelist using scorecards with a five-point Likert scale. Means were calculated from the scorecard data and nutritional content of each final recipe was assessed by Eshatrak software. The majority of the participants were white (100%) and female (87%). The ages ranged from 21 to 32 years and included students, faculty and staff. Overall acceptability score was 4.88 for the control whereas variation A (lentils served on whole wheat sandwich thin) was 4.75. Variation B (lentils served on lettuce) had an overall acceptability score of 4.38. Nutritional analysis indicated that the lentils burgers (variations A and B) had 70% less fat and 87% less cholesterol as the hamburger. Dietary fiber was increased by 312%. Protein found in the lentils burgers it was decreased by 48%, but the 3 oz. portion had 27.4 grams/serving, equivalent to 3 oz. of a hamburger. Calories were significantly reduced as the control was 639 kcals whereas variation A had 367 kcals and variation B had 238 kcals. Plant-based burger yielded similar overall acceptability scores as the hamburger and improved the nutritional quality of the product by significantly decreasing the fat, cholesterol and calories while increasing the dietary fiber.

Poster #6

Gene Sampling Technology for Rapid Microbial Genotyping in Microfluidic Device

Cassidy Husson[1], Cameron Bradford[1], Matthew Franklin[2], Rebecca Giorno[1], Gergana G. Nestorova[1]
[1]*School of Biological Sciences*
[2]*Mechanical Engineering*

This study reports the design and characterization of a lab-on-a-chip platform for bacterial lysis for subsequent one-step RNA purification and PCR analysis of bacteria. The developed portable. platform eliminated the multistep protocol for additional pre-concentration steps of the bacterial specimen while enabling selective isolation and enrichment for bacterial 16S rRNA for subsequent genomic analysis. The microfluidic chip will elegantly interface with a gene sample tool for dry and selective purification of 16S ribosomal RNA (rRNA) for microbial rRNA reverse transcription PCR genotyping. The efficiency of mechanical, enzymatic, and ultrasonic lysis efficiency was assessed using gram-positive (B. cereus) and gram-negative (E. coli) bacteria using commercial RNA purification. Ultrasonic lysis was the most efficient method for bacteria that have a thicker cell wall resulting in an average of 502ng of RNA from 1^10 7 B. cereus cells. Mechanical lysis provided the highest yield for gram-negative bacteria at an average of 4,438ng of RNA from 1^10 7 E. coli. Lysis efficiency testing was done using propidium iodide staining along with a Countess II instrument to compare viability before and after lysis. The design of the microfluidic platform includes piezoelectric plates for lysis introduction and temperature regulation to reduce the damage to genetic material. A wall thickness of 1.5mm helps retain material on an RNA capture pin during removal. The device was fabricated using a Form 3 printer using Formlabs 50A resin, and its dimensions do not exceed 9×6.5×6cm. A Gold- plated microscopic pin (200µm×25mm) was functionalized with thiol-conjugated synthetic RNA capture sequences for selective purification of bacterial nucleic acid. The NEB Next Custom RNA Depletion Design Tool was used to design 16S rRNA type-specific oligos that target the bacterial rRNA sequence of interest in E. coli and B. cereus. The 16S RNA selectively binds to the probe after at least 2 minutes of incubation in the bacterial lysate. The quality and the quantity of the nucleic acid were characterized and the genetic material was successfully used for PCR genotyping using TaqMan primers designed to amplify the 16S region of bacterial RNA. The Agilent 2100 Bioanalyzer test confirmed that the captured nucleic acid is selectively enriched for 16S rRNA. The RNA capture pin efficiency was 60ng of RNA per pin using E. Coli and 28ng per pin using B. cereus. This corresponds to 2.4ng and 1.12ng of RNA respectively per mm of a gold pin.

Poster #7

Recipe Modification of Peanut Butter Pie to Adhere to the Therapeutic Diabetes Lifestyle Plan

Mollie Blondin, Olivia Hery, Catherine Fontenot
School of Human Ecology

The National Diabetes Statistics Report indicates 37.3 million people have diabetes (11.3% of the US population) with 28.5 million adults who have been diagnosed. The purpose was to assess consumer overall acceptability, costs and nutritional content of peanut butter pie that substituted ingredients that were lower in sugar and fat. Panelists used a scorecard to assess selected sensory qualities--- appearance, texture, flavor and overall acceptability. A Likert- scale was used to rate each sample from one to five. The scorecard data was calculated using means and nutritional content of each final recipe was determined using EshaTrak software. Cost/recipe and per serving were calculated using sales receipts and ingredient amounts. The majority of the participants were white (58%) and female (58%). The ages ranged from 20-60 years and included students, faculty and staff. Overall acceptability score was 4.39 for the control, 4.09 for variation A (made with Nuefchatel cheese, PB2, Tru Whip) and 4.36 for Variation (cream cheese, ¼ cup peanut butter, and ¾ cup PB2 and Tru Whip). Nutritionally, the control had 490.7 kcals/slice; variation A had 214 kcals and variation B had 222 kcals. Fat content was reduced from 31.5 grams per slice to 13.2 and 12.6 for variations A and B, respectively. The cost per slice remained similar: Control .91/slice, variation A .83, variation B .84. Study indicates that using lower fat and sugar ingredients can produce a pie that is similar in selected sensory characteristics to the control without sacrificing expectations held by those who enjoy desserts.

Poster #9

Homemade Chili Recipe Modified for a Plant-Based Diet

Baylee Schneider, Payton Ayo, Catherine Fontenot
School of Human Ecology

Cardiovascular Disease is the leading cause of death among US adults. Adherence to a plant-based diet has been shown to reverse complications associated with heart disease. The purpose of this study was to assess consumer overall acceptability, costs and nutritional content of a animal-protein chili recipe using ingredients that were plant-based. Scorecards were used by panelist to assess selected sensory qualities---- appearance, texture, flavor and overall acceptability. A Likert-scale was used to rate each sample from one to five. Means were calculated from the scorecard data and nutritional content of each final recipe was assessed by Eshatrak software. Sales receipts and ingredient amounts were used to calculate recipes cost/serving. The majority of the participants were white (100%) and female (75%). The ages ranged from 20 to > 22 years and included students, faculty and staff. Overall acceptability score was 3.0 for the control whereas variation A (made with tofu) was 3.13. Variation B (made with kidney and black beans) had an overall acceptability score of 3.88. Nutritionally, one cup. serving, the control had 16.6 grams of fat, 7.9 grams and 5.8 grams of fat for variations A and B, respectively. The cholesterol content was reduced from 68.6 mg per 8 oz. to 0 mg for both variations A and B. The cost varied with the control costing $1.60, variation A $1.68 and variation B $1.48. Using plant-based ingredients to substitute for animal-based products yielded higher overall acceptability scores with this study population and significantly reduce the fat and cholesterol content.

Poster #10

How Terrestrial Salinization Impacts Isopod Growth and Behavior

Danielle Orcutt[1], Katelynn Freeman[1], Luis Santiago-Rosario[2], Natalie Clay[1]
[1] School of Biological Sciences
[2]Department of Biological Sciences, Louisiana State University

Both terrestrial and aquatic systems face increasing salinization challenges globally from climate change, sea level rise and anthropogenic activities like road salting, agricultural practices, and resource extraction. Sodium (Na) is an essential element required for metabolism regulation in heterotrophs. Plant consumers, including detritivores, are typically Na-limited as plants do not require Na and often contain little in their tissues, whereas plant consumers concentrate Na 10-100's times more. Decomposition rates mediate global carbon cycling, and recent evidence suggests decomposition rates are in part regulated by Na. A previously overlooked pathway by which organisms are exposed to increased salinity is via detritus. Terrestrial isopods (Armadillidium vulgare) are model organisms to examine effects of Na because they are nearly ubiquitous decomposers, occupy a gradient of salinity, and are easy to raise in the laboratory. The Sodium Subsidy-Stress hypothesis (SSS) hypothesis posits that Na increases organismal function up to some optimal threshold after which organisms are stressed and decrease function. We tested the prediction that Na provided in the diet (detritus) versus environment (water) across a gradient of Na would differentially impact isopod growth, consumption, and ingestion efficiency reflecting a hump-shaped response with increasing exposure to Na. Medium Na in both diet and environment should promote the highest isopod function. Isopods were exposed to a fully factorial design of low, medium, and high Na in their diet and environment. The results of this study will lead to a better understanding of how global salinization is likely to impact organisms and their environments.

Poster #11

The Role of Notch3 in Adipose Stem Cell Fate

Sydney Mashaw, Kate Horton, Suraj Patel, Jamie Newman
School of Biological Sciences

Stem cell-based therapies are the future of medicine, as their natural abilities of self-renewal and differentiation have the potential to treat currently incurable diseases. Stem cells are categorized based on differentiation potential, with multipotent stem cells being the most differentiated while still having the ability to divide down defined lineages. Adipose stem cells (hASCs) are easily derived multipotent, mesenchymal stem cells with already demonstrated therapeutic potential. Despite current success, there are a multitude of factors that regulate the physiology and role of adipose stem cells, including transduction pathways and transcription factors, that remain to be researched and fully understood. One such transduction pathway –the Notch signaling pathway– is known to be crucial in stem cell proliferation, differentiation, and apoptosis in all animals. The focus of my research is on Notch3, one of four Notch transmembrane surface receptors involved in stem cell fate determination, embryonic development, and some forms of cancer. I utilized siRNA-mediated knockdowns of Notch3 to evaluate its role in stem cell proliferation, self-renewal, metabolism, and morphology. Results have indicated that Notch3 plays a highly active role in cellular proliferation and self-renewal, while not eliciting an effect on metabolism and morphology. This data continues to drive the research into stem cells and their regulators forward, bringing us one step closer to finding curative degenerative disease treatments.

Poster #12

Identification of Organophosphate Degrading Microorganisms in Northern Louisiana

Jacob Mitcham, Kristina Theriot, Marissa Robertson, Rebecca Giorno-McConnell, Terri Maness
School of Biological Sciences

Organophosphates (OPs) are commonly used pesticides around the world, accounting for more than 40% of all pesticides used. OPs also serve as the active ingredient in chemical warfare nerve agents such as sarin and Novichok. Exposure to OPs can have acute effects such nerve damage and death or result in long-term and sublethal deleterious effects on nontarget organisms in the environment. The widespread use and consequent accumulation of these compounds in soils, drainage areas, waterways, and on our food has generated interest in finding ways to bioremediate contaminated sites. This project aims to identify soil microorganisms that have the ability to degrade OPs. We collected 35 soil samples in and around the Ruston, LA area, grew the soil microorganisms in OP selective media, and then sequenced the V3 and V4 variable region of 16s rDNA from the organisms that were positive for pesticide degradation. We found positive samples from ten different locations and isolated nine organisms with the ability to degrade OPs. The organisms we identified were Enterobacter hormachei, Klebsiellia spp. (pseudomonas & quasipneumoniae) and, Pseudomonas spp. (stutzeri & aeruginosa). We also measured the degrative ability of these microbes over time using spectrophotometry to determine which strains were more efficient. Our results can help us understand how pesticides are used and spread through the environment in our region and increase our capability to bioremediate contaminated sites. Further research should investigate the specific enzyme(s) these organisms use to breakdown OPs.

Poster #14

Effects of Temperature on the Degradation of Tannins

Emma Michael, Julia Earl
School of Biological Sciences

Tannins are a group of natural polyphenols that bind to proteins and can be found worldwide in plants. Tannins are known to reduce absorption of nutrients into the body, and they can also cause issues when in water. They can reduce the dissolved oxygen content in bodies of water, which can negatively affect the species in that area. There are many factors that can influence the concentration of tannins in water, but temperature is not a factor that has been widely studied when compared to tannin degradation. Our research objective was to determine if the temperature of a body of water could affect the rate of tannin degradation. We also are interested in the different effects temperature has on tannic acid versus tannins derived from leaves. We added tannins to DI water in jars and manipulated the temperature using aquarium heaters. We had jars with no tannins or heaters (control), tannins at room temperature, and jars of tannins at approximately 85°F. Each jar was sampled at day zero, one, three, seven, and fourteen at the same time each day. Finally, a tannin-lignin test was performed with a spectrophotometer to measure the tannin concentrations in each sample. Our results show that there was a significant decrease of tannin concentration in the 85°F treatment compared to the room temperature treatments. Our results show that tannin degradation is increased at higher temperatures. Future experiments should include more temperature treatments as well as more samples.

Poster #15

The Impact of Restoration on Pollinator Diversity in a Shortleaf Pine-Oak-Hickory Forest

Taygan Kohlman, Don Shepard, Natalie Clay
School of Biological Sciences

Land use and cover are increasingly changing due to climate change and anthropogenic activities with many of these changes negatively impacting biodiversity. However, ecosystem restoration can help to reverse these patterns. Northern Louisiana was historically dominated be shortleaf pine-oak-hickory forests but has been converted largely to loblolly pine forests with little-to-no herbaceous ground cover. The objective of this study is to determine how different management practices on a shortleaf pine-oak-hickory forest restoration site affect the pollinator diversity compared to no restoration. We predicted prescribed burning and herbicide treatment would increase pollinator species diversity and abundance. We sampled pollinators on three management regimes: 1) burned with active herbicide treatments for non-desirable plant species, 2) just burned, and 3) no management. For data collection we set out pan traps that contained ~200 ml of water with soap. Pan traps were placed 5m apart in an "x" shape and left out for 24 hours. Three plots of each management regime (n=9) were sampled once a month for 6 months. We found greater diversity, evenness, and richness where burning took place compared to the no management plot with no restoration. Specifically, the burn herbicide site had ~1.5 times higher diversity than the no management site and the burn herbicide site was most similar to the burn site. These results can be used in future restoration efforts and management practices of shortleaf pine-hardwood forests.

Poster #16

Parasite Dynamics in Treated and Untreated horses in Fall and Winter Months in Louisiana

Kelsey Spencer, Rebecca McConnico
School of Agricultural Sciences & Forestry

Equids can harbor an excess of intestinal parasites. Understanding the seasonality of egg shedding and transmission is important for designing an effective parasite control program. Intestinal parasites in horses, including both large strongyles (eg.Strongylus vulgaris) and small strongyles (cyathostomes), have a detrimental effect on cecocolonic functional physiology in horses in Fall/Winter in North Louisiana. Infection with these intestinal parasites may be reflected in changes in body weight, peripheral white blood cell count, serum albumin levels, and serum chemistry profiles. This study will be conducted from November 2022-February 2023. A herd of 15 horses will be randomly divided into treated and untreated groups and evaluated throughout the 4-month period. Treated horses will receive an avermectin product plus praziquantel via oral administration after initial sampling procedures have been completed during the first week of the study. Sera and feces will be collected from all horses, and worm burdens enumerated via fecal egg counts using standard techniques. Blood parameters will be determined using an IDEXX hematology and serum chemistry analyzer. Data will be analyzed using ANOVA for serial sampling in treated and untreated animals. This research project is still ongoing, and we do not have definite results yet. We suspect that there may be a general seasonality in strongylid egg shedding throughout the year among these mature horses and that increased shedding may be greater in the Spring/Summer when additional studies will be conducted. These studies will lead to the overall well-being and heard health of the horses.

Poster #17

Astrocyte-Derived Extracellular Vesicles as a Novel Approach to Reduce Brain Endothelial Cells Oxidative DNA Damage

Ruth Stewart, Faria Binte Hossain, Ryson Shelton, Gergana G. Nestorova
School of Biological Sciences

8-OHdG is an oxidized derivative of deoxyguanosine and the most common biomarker of oxidative DNA damage. Increased levels of 8-OHdG are implicated in age-related neurological disorders, carcinogenesis, cardiovascular disease, inflammation, and aging. Unrepaired damage leads to C: C to A: T transversion in the DNA. The adduct is excised by the glycosylase OGG1. The central hypothesis of this study is that astrocytes-derived extracellular vesicles (EVs) will reduce oxidative DNA damage and ROS levels in human endothelial brain cells (HEBCs). Astrocytes and HEBCs are the main constituents of the blood-brain barrier. Horizontal transfer of the EV astrocytes-derived OGG1 mRNA cargo via endocytosis or fusion with the membrane of the recipient HBEC is expected to lead to a reduction of genomic 8-OHdG, OGG1 mRNA expression, and ROS levels. Treatment with sodium dichromate (100µM, 1mM) for 5 and 16 hours was associated with a significant increase in ROS levels ($p<0.05$) and a 45% percent reduction of cell attachment. HEBCs were divided into three groups: nontreated (baseline), treated without exosomes, and treated with exosomes. The treated groups were exposed to sodium dichromate (100 µM, 1 mM) and incubated for 5 and 16 hours. The ELISA results indicated the addition of exosomes in the 100 µM group resulted in a statistically significant reduction of genomic 8-OHdG. RT-qPCR results show that OGG1 mRNA levels are increased after treatment with 100µM and 1 mM sodium dichromate. The successful results of this research will provide insight into the EVs-mediated neuroprotective effects for the development of alternative treatments for neurodegenerative disorders.

Poster #18

Analysis of the Effects of Microgravity on Phytochromes in Arabidopsis

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Plants respond to their external environment through tropisms, which are growth-mediated movements. Phytochromes are known to play a role in the sensing and response to red light photostimulation. While responses to light (phototropism) and gravity (gravitropism) have been well characterized, little is known about the interaction between the two responses. *Arabidopsis thaliana* wildtype seedlings as well as mutants of Phytochrome A and Phytochrome B were grown in the European Modular Cultivation System (EMCS) as part of the Seedling Growth series of experiments on the ISS. On-board centrifuges were used to create gravity vectors of microgravity (0g) and 1g. In addition, plants were exposed to unidirectional blue light or red light at each magnitude of gravity. Arabidopsis samples were sequenced via RNA-seq, and subsequently analyzed for differential gene expression. Futhermore, a pathfindR analysis was conducted. Here, we discuss the effects of microgravity on the mutants of Phytochrome A and Phytochrome B.

Poster #19

Role of the Notch Signaling Pathway and Conditioned Media in Human Adipose-Derived Stem Cells

Kate Horton, Olivia Hubbard, Suraj Patel, Isabella Redman, Jamie Newman[5]
School of Biological Sciences

Stem cells are undifferentiated cells that originate from one lineage and can self-renew and differentiate into specialized cells. Human adipose-derived stem cells (hADSCs) are mesenchymal stem cells harvested from adipose tissue that can differentiate into adipocytes, osteocytes, or chondrocytes. hADSCs have implications for regenerative medicine in areas of wound repair and degenerative disease. Stem cell fate can be directed by exposing cells to environmental stimuli or activating signal transduction pathways. The Notch signaling pathway regulates cell proliferation, differentiation, and fate in animals. The pathway consists of four cell surface receptors and five ligands. We will investigate how the Notch3 receptor affects hADSC self-renewal and differentiation potential to determine if it may be a targeted pathway to enhance stem cell clinical applications. To test this, we will lower the levels of *notch3* expression and measure changes in self-renewal by monitoring colony formation, metabolic rate, and expression of *ki-67*, a gene which is highly expressed when cells are proliferating. We will also examine the secretome of cells expressing normal and decreased levels of Notch3. The secretome is the compilation of factors secreted by cells, so we will collect media from cells described earlier (conditioned media) and use that to culture hADSCs. We will then examine the influence that this conditioned media has on cell proliferation by again monitoring colony formation, metabolism, and *ki-67* expression. Together these two sets of experiments will inform us about the role Notch3 plays in the maintenance of hADSC state and thereby contribute to possibilities in regenerative medicine.

Poster #20

Effects of Leaf Diversity on Aquatic Invertebrate Abundance and Diversity in Ponds

J.D. Flores, Julia E. Earl
School of Biological Sciences

Pond ecosystems are essential for many aquatic invertebrates. Leaves play an important role in these ecosystems, because they provide a source of nutrients and shelter from predators for many aquatic invertebrates. The leaves that fall into pond ecosystems come from several native and non-native tree species, which can differ greatly in physical and chemical characteristics. These characteristics are known to affect the abundance and diversity of aquatic invertebrates, but not much is known about how aquatic invertebrates are affected by leaf diversity. This study examines whether leaf diversity affects aquatic invertebrate abundance and diversity in ponds. For this experiment, I created mesh bags filled with leaf litter, which contained 3, 5, 7, or 9 leaf species to create different levels of leaf diversity. I then put the leaf mesh bags into three ponds located in northern Louisiana in February 2022. One third of the mesh bags were pulled from the ponds after one month (March), two months (April), and four months (June). In the preliminary results from the March and June, I found 1,353 individual invertebrates in 129 leaf mesh bags. In March, there was a significant interaction between pond and the leaf species richness treatment for the abundance of amphipods, isopods, and diptera (fly larvae). In June, leaf species richness affected total aquatic invertebrate abundance, in which the 9 species richness treatment had lower total invertebrates than the other levels of leaf species richness. These results provide information on how the management of trees surrounding pond ecosystems will affect the abundance and diversity of aquatic invertebrates in ponds.

Poster #21

Branching Out After 100 Years to Describe Sonderegger Pine Morphology

Kelsey Shoemaker, Paul Jackson
School of Agricultural Sciences and Forestry

In the southern United States, longleaf pine (Pinus palustris) and loblolly pine (P. taeda) are most widely known for providing one of the most diverse forest ecosystems in the world and a fast-growing reliable supply of timber for wood products, respectively. Conversely, Sonderegger pine (Pinus x sondereggeri), the natural hybrid of longleaf and loblolly pine, is considered less desirable than either parent species and culled when detected in forest tree nurseries. Historical descriptions deemed the hybrid a producer of poor-quality wood because of abnormal branch development and high numbers of branches at maturity. Outplanting hybrid seedlings onto lands designed for genetically pure longleaf pine is another reason Sonderegger pines are not outplanted. For a century, generalizations of Sonderegger pine as an inferior tree has led to an absence of research to evaluate its morphological development from the seedling to mature stand management stages. In 2018, 400 Sonderegger pine seedlings were acquired from a nursery and outplanted on the Kisatchie National Forest with the main objective to document their growth and development over time. Before planting, each seedling was numbered for future data reference, and seedling height and root collar diameter were recorded. At age five, tree height and diameter at breast height were measured, and evaluations for stem straightness, forking defects, and disease occurrence were made. These observations along with assessments of branch angle, diameter, and height along the bole may give insight on juvenile Sonderegger pine morphology as it relates to long-term wood quality and utilization.

Poster #22

Does Nuclear DNA Support the Recognition of Four Species within the Caddo Mountain Salamander, Plethodon caddoensis?

Drew Delahoussaye, Dr. Don Shepard
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Salamanders are important components of ecosystems for many reasons: they regulate food webs, contribute to ecosystem resilience, and are essential indicators of ecosystem health and integrity. Many salamander species are susceptible to extinction caused by habitat loss or climate change. To minimize the probability of extinction, it is vital to recognize and protect biodiversity both in terms of species and the genetic diversity within them. Discovering and naming new species provides targets for conservation efforts whereas genetic diversity within populations is associated with greater capacity for adaptation. Caddo Mountain Salamanders (Plethodon caddoensis) are an imperiled species unique to the Ouachita Mountains of Arkansas. Shepard and Burbrink (2011) found four genetically and geographically distinct lineages within P. caddoensis that may be separate species. While these lineages were supported by mitochondrial DNA, analysis of nuclear DNA is needed to confirm their validity. To test the hypothesis that each lineage represents an evolutionary independent species, we sequenced the nuclear gene POMC of forty individual P. caddoensis with multiple representatives of each of the four lineages. We predict nuclear DNA will support the recognition of the four lineages as different species. If our hypothesis is supported, then these new species will be described so that they may be protected, helping to ensure their long-term survival.

Poster #23

Evaluating the Effects of Hydroperiod on Trophic Ecology and Diet

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Due to the increasing frequency of drought brought on by climate change, many ponds may experience changes in their normal hydroperiod, altering the current trophic ecology of the organisms present. I propose using stable isotope analysis (SIA) to analyze how aquatic insect species' trophic level and diets differ in ponds with varying hydroperiods. SIA is useful because it allows researchers to estimate trophic level and diet accurately. Using 15 N isotopes, I can estimate trophic level since each ascending level becomes enriched in 15 N. I can use 13 C to assess diet because consumed items each have a unique 13 C signature that is detectable in the consumer; this means I will have to sample for potential prey items of the target species as well as snails, which make good reference organisms because they are known herbivores. I will sample six ponds: three permanent and three ephemeral for 40 Hemipteran and Coleopteran species since they are all colonizers of (and thus present in) ephemeral ponds. The samples will need to be identified and left to clear their stomach contents, allowing me to focus on isotopes assimilated into tissues. The samples will need to be freeze dried and sent off for SIA, where they will be analyzed in a mass spectrophotometer. Using data analysis, I will determine if there is a significant difference in the trophic ecology and diet of insects in relation to hydroperiod.

Poster #24

Leaf Species Effects on Mosquito Oviposition

Da'Monique August, Julia E. Earl
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Mosquitoes (family culicidae), a member of the Diptera order, are responsible for an estimated 750,000 human deaths annually due to the transmission of diseases such as malaria and West Nile virus. Diptera is a large order of insects containing an estimated 1,000,000 species. One of the most abundant Diptera families within Louisiana are mosquitoes. Some species of mosquitoes can carry disease-causing microorganisms, often viruses, to human and/or animal hosts. The oviposition of females greatly impacts which diseases are being transmitted in certain areas. Many characteristics of aquatic habitats could affect mosquito oviposition decisions. We examined the effect on leaf litter species on mosquito colonization. We had three treatments of leaf litter: Post Oak, Magnolia, and Loblolly Pine in two different blocks, each consisting of three replicates of each treatment. Each replicate was a bucket with 15L of water and 15g of leaves covered with a mesh cover to make it easier to separate the insects from the leaves. We collected all insects present above the mesh twice per week and counted the number of mosquito larvae. We expected that Magnolia would be the preferred treatment, Post Oak could be intermediate, and Loblolly Pine would be avoided due to the nutrient and tannin concentrations. By determining which tree species has the most abundant mosquito colonization, we can eventually determine how these tree species contribute to the spread of viruses within the state of Louisiana and make recommendations for planting species avoided by mosquitoes in suburban neighborhoods.

Poster #25

Ingestion of Microplastics by Louisiana Waterfowl

Garrison Lowder[1], Katie Redman[2], Sarah Bollinger[1], Taylor Carnes[1], Emily Curry[3], Emilee Doyle[1], Aspen Frazier[1], Thomas Jackson[1], Kaiden Morace[1], Hailey Stroderd[1], Nicolas Vaccaro[2], Eli Watkins[1], Terri J. Maness[4]

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Plastic production and use has increased exponentially in recent decades and the resulting waste has become a global environmental threat. Ingestion of plastics can damage the GI tract, reduce nutrient uptake, and kill wildlife. Yet little is known about the incidence or quantity of plastics ingested by birds in freshwater systems. Our goal is to examine microplastic ingestion by waterfowl in Louisiana. Microplastics are particles of plastic that are 1-5mm in size. Waterfowl can be divided into two broad groups based on their feeding habits: divers and dabblers. Dabblers tip upside down to feed on aquatic life, such as small invertebrates and vegetation. Diving species plunge below the surface to catch fish or glean invertebrates from the bottom. We predict that feeding mode will influence the incidence and quantity of ingested microplastics. To investigate this question, we are examining the GI tracts of ducks harvested by hunters in Louisiana during the 2013-14 hunting season for the presence of microplastics. Ducks were collected all over the state. Data we collect are plastic type (fiber, film, foam, nurdle, or fragment) and plastic color. Here, we report our preliminary data. To date, no one has investigated microplastic ingestion by waterfowl in the Gulf of Mexico region. Our data will provide critical information about the threat of plastics in Louisiana's aquatic systems and can be used as a basis for scientifically sound mitigation and management initiatives.

Poster #26

Metalized Halloysite Nanotubes (mHNTs) and Hydroponic Plant Growth

Dr. David K Mills
School of Biological Sciences

The research addresses NASA's goal of sustaining crews on long-duration space exploration missions beyond low-Earth orbit, including missions to the surface of the Moon and Mars. These missions will require nutritionally valuable food crops reliably grown in an artificial environment defined by altered gravity levels and atmospheric and soil conditions. In addition, space agencies across the globe need to address long-duration lunar missions and provide future lunar crews with nutritious food while in lunar orbit or on the lunar surface. We aim to create a novel, game-changing plant growth technology that requires minimal input and yields safe and nutritious plant crops. Though many food systems on Earth benefit space travelers, these systems' ability to meet spaceflight demands has not yet been established. We used magnesium-coated halloysite nanotubes (Mg/HNTs) as our growth supplement. Mg/HNT size, morphology, concentration-dependent effects, and role in influencing plant response were studied. Mg/HNTs were added to hydroponic growth systems that contained cherry tomatoes (3 varieties). Controls did not receive MgHNTs. Prior studies have shown no enhanced growth effect using native HNTs. Hydroponic growth systems are included as purchased hydroponic growth units and the same unit with an aquarium aerator unit to enhance oxygenation and water movement. Mg/HNTs, as compared to controls, showed enhanced plant growth, including plant growth rate, flowering, fruit production, and stem number and height. This project is dual use with potential applications for small and large-scale agriculture. Current work is directed toward aerator systems containing pelted Mg/HNTs and calcium phosphate/mg/HNT composites.

Poster #27

Cell co-culture microfluidics platform with an integrated hydraulic valve for controlled interaction of brain endothelial cells and astrocytes

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Lab-on-a-chip systems for real-time analysis of neural cell communication is an emerging topic of neuroscience research that can provide a better understanding of brain functionality. Astrocyte and HBEC-5i co-culture provide in vitro model of the blood-brain barrier. The successful employment of lab-on-a-chip cell co-culture devices in research settings requires fabricating materials that are not cytotoxic to the cells. Controlled and reversible separation of cell culture chambers is crucial for real-time studies of extracellular-mediated cell-to-cell communications. This study demonstrated a 3D printed cell co-culture microfluidic platform that can allow the cells that enable controlled separation of the chambers and provide the long-term viability of the cell lines. The platform consists of two 27.5 mm × 35 mm × 10 mm cell culture chambers separated by an Elastic Resin 3D printed hydraulic valve (10 mm × 35 mm × 9.5 mm). The actuation of the valve is controlled using hydraulic pressure exerted by the chamber positioned directly above the valve. The deflection of the valve barrier provides separation of the cell chambers and the individual microenvironments. Upon the release of the pressure, the valve returns to its original position and allows the exchange of signaling molecules between the cells. The lower glass channel wall of the microfluidic device was coated with gelatin and Poly-L-Lysine to provide cellular attachment for HBEC-5i cells and astrocytes. The polyelectrolyte immobilization efficacy was assessed via atomic force microscopy while the viability of the cell was assessed using fluorescent-based methods.

Poster #28

Antimicrobial Coatings Composed of Chitosan, Poly Vinyl Alcohol and Zinc-coated Halloysite Nanotubes

Sindhu Datla, David K. Mills[1]
School of Biological Sciences

Edible coating materials have been extensively researched to extend the shelf life of cherry tomatoes and reduce the risk of ingesting chemical reagents. Chitosan (CH) is widely used as a natural preservative for fruits and vegetables, but it is poor mechanical, and water resistance limits its use. To improve the mechanical properties of chitosan, we prepared chitosan composite films by incorporating polyvinyl alcohol (PVA) with varying amounts of halloysite nanotubes (HNTs) and zinc oxide coated HNTs (ZnHNTs) into a 1% Chitosan solution. The effects of PVA/CH blended films with varying concentrations of HNTs and ZnHNTs were assessed using SEM/FESEM, FTIR, XRD, and mechanical tests. FTIR and XRD confirmed the presence of zinc on the HNT surface. SEM showed a rough surface that increased roughness with HNT/ZnHNT addition. Adding ZnHNTs and HNTs improved the chitosan/PVA film's tensile strength (TS) and elongation at break (EAB) with decreased light transmittance. In addition, we tested the films' antibacterial activity against *Staphylococcus aureus* (*S. aureus*) and *Escherichia coli* (*E. coli*). The CS/PVA/ ZnHNT films were significantly antimicrobial over two weeks. Coatings made of PVA and chitosan (80/20 ratio) with concentrations (0, 0.2%, 0.4%, and 0.6%) of HNTs and ZnHNTs were selected for further study. The results indicated that the bio-based films could extend food shelf life and be used as novel active food packaging materials. Among them, the most promising film was 0.6% ZnHNTs, showing a good preservation effect. However, further testing will be required to demonstrate its potential as an edible coating.

Poster #29

How Implementing Grain in Cattle's Diets Affects the Yield Grade of a Carcass

Rachel Carrigan[1], Gabrielle Bird[1], Caitlin Lawrence[1], Kylie Maldonado[1], Makenzi Williamson[1], Spencer Stelly[2,3], Gorden Reger[1], and Mark W. Murphey[1]

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This is an ongoing project to determine the production trends of cattle harvested in North Central Louisiana at the Louisiana Tech Meat Science Laboratory. Our research is designed to investigate the effect of daily production practices that affect the yield grade of the meat with the goal of informing producers. The study utilizes data collected from 428 heads of cattle presented for harvest from January 12, 2021, to February 14, 2023. In our data collection process, each offal item is removed from the carcass, weighed individually, and returned for inspection by State Inspectors. We then conducted a phone interview with each producer to get insight of how they are feeding their animals. Research in data has indicated that 52 head of cattle did not have grain in their diet with an average yield grade of 1.98, ranging from 0.70 to 3.82. There are 376 head of cattle that did have grain in their diet with the average yield grade being 2.16, ranging from 0.08 to 7.83. Within the 376 head of cattle, we were able to look at 275 heads where we knew the length of time they were fed grain. The longest amount of time being 1460 days, average yield grade 1.585, and the shortest being 1 day, average yield grade 2.092. There is one strong peak at 548 days where the average goes up to 4.71 with this being the peak, there is a slight bell curve with the data at 456 days to 730 days. The length of times before and after show little to no trend in grain fed vs. length of time.

Poster #30

Studies on inhibiting spore-associated Alanine Racemase(Alr) using various Amino Acids

Samuel Donn, Rebecca Giorno
School of Biological Sciences

Bacillus anthracis spores are dormant infectious particles. Under the right conditions, these particles germinate and transition into their dangerous and active form (anthrax). Spores are notoriously resistant to harsh, usually sterilizing conditions; and can stay dormant on a surface for years. Spore germination (leaving dormancy) begins whenever the correct nutrients are present (L-alanine and an amino acid or nucleoside). Alanine racemase (Alr) converts L-alanine (germinant) to D-alanine (germination inhibitor) and vice versa, affecting the germination rates of spores. Inhibition of spore-associated Alr in the presence of germinants enhances the number of spores that germinate. This in turn could enhance B. anthracis decontamination strategies, as germinated spores are more susceptible to standard inactivation techniques. Previous studies indicate that multiple amino acids inhibit Alr activity in different bacterial species. We are exploring the possibility that these amino acids will also inhibit the spore-associated Alr in B. anthracis and enhance germination. We used two different methods to determine the effect of the target amino acids on B. anthracis spores. The first was a fluorescence-based assay to measure the Alr activity of the spores. The second was a germination assay to see if the target amino acids enhanced germination. We have confirmed that the fluorescence assay is not negatively affected by the amino acids tested and are currently in the process of measuring Alr activity. Once complete we will conduct germination assays. Identification of non-antibiotic Alr inhibitors will contribute to our long-term goal of developing novel strategies for wide-area decontamination.

Poster #32

Physico-chemical and Cytotoxicity Assessment of Chitosan/Carboxymethyl cellulose/halloysite Composite Film Membranes

Abdul-Razak Masoud David K. Mills
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Flexible film membranes are one of the most common dressings for managing superficial wounds. They are advantageous over other wound management methods because of their ease of application, their ability to regulate the wound microenvironment by keeping the wound surface moist while serving as a barrier against pathogens, as well as their potential of enhancing the wound healing process. Chitosan, a natural polymer obtained from chitin via a deacetylation process, has been shown to possess properties including hemostasis capability, adhesion support and film forming capability. Carboxymethyl cellulose, a natural polymer, and a water-soluble cellulose-derivative, contains abundant hydroxyl groups so it can easily react with chitosan. Halloysites occur naturally as aluminosilicate kaolin sheets and form tubular structures that can be functionalized. This confers properties such as thermal stability, large aspect ratio and surface area. They are thus, conducive for use as nanocarriers for the attachment and loading of bioactive molecules. We therefore hypothesize that a composite comprising of the above- mentioned materials would result in a wound healing film with reinforced mechanical strength, low toxicity, and improved wound healing capability. CTS and CMC films were fabricated via solvent casting according to De Silva et al. with some modifications. The composite films were doped with metal coated HNT loaded with antibiotics for additional functionality and tested for the antibacterial properties and non-cytotoxicity. The film membranes were also assessed via XRD for their crystalline structure. The results obtained showed that all the samples had antibacterial properties against E. coli; S.aureus, with the antibiotic-loaded metalized halloysites suppressing bacterial growth most effectively. Results from further tests suggest that the dressing is biocompatible and non-toxic to eukaryotic cells.

Poster #33

Effects of Hormex Rooting Powder No. 16 for Difficult to Root Woody Plants on Shoot length, Root Length, Root Area, Root Volume, and Leaf-out on American Sycamore and Eastern Cottonwood Cuttings

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American Sycamore (Platanus occidentalis) and Eastern Cottonwood (Populus deltoides) are very fast-growing trees and are targeted for production for biomass related products. They can produce sexually or asexually allowing for both breeding programs and then deployment of specific genotypes rooted cuttings. This allows for capture of genetic gains and easy reproduction of Cottonwoods and Sycamores. Hormex Rooting Powder No. 16 For Difficult to Root Woody Plants (Hormex) is produced for woody species that show difficulty in rooting. The objective was to determine if applying Hormex to easy root species (cottonwood and sycamore) enhance shoot and root lengths, root area, and root volume. Here we show, that applying the rooting hormone Hormex significantly influences the shoot length of sycamore and cottonwood cuttings. It was concluded that applying rooting hormone was not a viable solution to assist growth thus not spreading the best possible genetics.

Poster #34

Evolutionary Relationships of the Slimy Salamanders *Plethodon kisatchie* and *Plethodon mississippi* Across the Mississippi River

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Slimy Salamanders of the *Plethodon glutinosus* species complex are a classic example of cryptic species for which species boundaries and relationships have proved difficult to determine. These 13 morphologically similar species were once thought to be a single species ranging across the eastern United States, but protein analysis revealed high genetic divergence among geographically distinct groups of populations. Two of these species, the Louisiana Slimy Salamander (*Plethodon kisatchie*) and the Mississippi Slimy Salamander (*Plethodon mississippi*), are closely related but occur on opposite sides of the Mississippi River, a strong barrier to gene flow in many organisms. Previous phylogenetic studies of *Plethodon* have only included 1–2 samples of each of these species, thus a rigorous test of their validity has never been conducted. To investigate the evolutionary relationships of *P. kisatchie* and *P. mississippi*, we are obtaining tissue samples from throughout their distributions, extracting DNA, and then amplfying and sequencing the mitochondrial *ND2* gene. Phylogenetic analysis of nine populations of *P. kisatchie* and six populations of *P. mississippi* indicates the species are not distinct from one another; *P. kisatchie* forms a clade nested within *P. mississippi*. Furthermore, genetic diversity within *P. kisatchie* is low, suggesting a recent separation from populations of *P. mississippi*. Our results underscore the importance of adequate sampling of genetic variation within species when studying evolutionary relationships. Next, we plan to add samples from more populations, sequence additional genetic loci, and employ species delimitation methods to explicitly test if *P. kisatchie* and *P. mississippi* are separate species.

Poster #35

DNA Barcoding of Borer Moths (Genus Papaipema) Reveals High Species Richness on Fort Leonard Wood, Missouri

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Military bases are among the few remaining places in the United States with large areas of relatively undisturbed native vegetation. Because of this, military bases have the potential to harbor a high diversity of species, sometimes acting as safe havens for species of conservation concern. Determining what species occur on military bases can aid in implementing best management practices for at-risk species. Created in 1940, Fort Leonard Wood (FLW) in the Missouri Ozarks is ~62,911 acres of primarily forest habitat, although savanna and prairie habitats were common historically. The 47 species of borer moths of the genus *Papaipema* have specific host plants but are difficult to identify using morphology. Some species, such as the Rattlesnake-Master borer, *Papaipema eryngii*, are of conservation concern. We used DNA barcoding to identify *Papaipema* on FLW and generate a species inventory. We collected ~200 *Papaipema* from FLW in 2019–2020, extracted DNA from specimen legs, amplified the mitochondrial CO1 gene using PCR, and sent products for sequencing. Analysis of 80 individuals revealed 20 different species of *Papaipema* on FLW. Of these, we found one *P. eryngii* as well as three potentially new species. Knowing the full diversity of *Papaipema* on FLW will be useful for future management efforts. Because species have specific host plants, practices that increase abundance of host plant species are likely to result in increased abundance of associated moth species. This could be especially important for prairie plants and their associated moth species, such as Rattlesnake Master and the imperiled *P. eryngii*.

Poster #36

Fine woody debris as a source of space and energy increases predators and decomposition in brown food webs.

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Community structure and ecosystem function may be driven by the amount/size of habitat and energy within an environment, but these metrics (space and energy) are difficult to separate, especially in systems where habitat is also a source of energy such as detritus (dead organic matter including deadwood). Decomposition of detritus is essential for the recycling of nutrients, and fine woody debris (FWD) constitutes ~50% of deadwood in forest ecosystem. Therefore, understanding how FWD affects leaf litter invertebrate communities is essential for forest management and conservation. Here we tested whether FWD affects leaf litter communities more as a source of space or energy. We predicted that experimental treatments which added FWD both as space and energy would support distinct detrital communities and increased decomposition. To test this, we manipulated the presence or absence of FWD as either space (synthetic wood) or energy (wood added as sawdust) and compared experimental treatments to no manipulation controls. After 7 months, we found the addition of FWD as a source of energy, but not space, supported a distinct community composition with an abundance of detritivores. Conversely, FWD as a source of space increased the proportion of carnivores and decomposition of more labile substrates. However, the addition of FWD as both space and energy resulted in the greatest proportion of carnivores and decomposition. These results suggest that FWD positively effects leaf litter communities as both space and energy; therefore, FWD inputs are essential in maintaining forest litter decomposition and furthering forest ecosystem function.

Poster #37

Classification of Early Childhood Educators' Behaviors to Improve WISE Implementation

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Childhood obesity remains a growing issue to tackle, especially in the Southern US where obesity rates are highest. To combat obesity, the evidence-based Together, We Inspire Smart Eating (WISE) Program targets the promotion of preschoolers' fruit and vegetable consumption. Early Childhood Educators' (ECE) fidelity to WISE, attitudes toward WISE, and workplace influence are important for WISE implementation, in accordance with the established Fidelity, Attitude, and Influence Typology (FAIT). This study explores ECEs' WISE FAIT change, from baseline to midpoint. Using baseline FAIT classification, ECEs were targeted with tailored implementation facilitation to improve fidelity and attitude. We hypothesized this strategy would increase the proportion of ECEs with high fidelity and positive attitude. Research assistants coded fidelity on a 1 ("Not at all") to 4 ("Very much") scale for 4 WISE evidence-based practices. ECEs completed self-report surveys on workplace influence and attitude toward WISE on a 5-point scale (higher scores reflect more positive attitude and greater influence). At baseline, 40% of ECEs were in a desired typology (i.e., adopting with fidelity). From baseline to mid-point, 42% of teachers improved their FAIT category; 32% remained the same. Instances of worsening typology (27%) were mostly attributed to losses in fidelity. These midpoint results were used to update implementation facilitation targets for the remaining 3.5 months of WISE. These results suggest that using FAIT to inform facilitation supports ECEs to move toward adoption with high fidelity. We expect these improvements to correlate with improved child health outcomes and program sustainment which will be re-assessed end-of-year.

Poster #38

Genomic Sequencing of SARS-CoV-2 Benefits COVID-19 Surveillance

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With advancements in sequencing technology, monitoring the genetic evolution of pathogens is now more accessible than ever. During outbreaks, the ability to monitor viral mutations provides a unique perspective on the dynamics of viral spread and can provide insight into the potential trajectory of the outbreak. In 2021, we began sequencing SARS-CoV-2 patient samples to monitor viral mutations and identify variants present in Lincoln Parish. Our data was added to a global genome network, GISAID, where researchers around the world share data that is used in disease surveillance and public health. We collaborated with local clinics and Grambling State University to generate 295 sequences identifying 24 Delta variants and 271 Omicron variants in Lincoln Parish. Using the Oxford Nanopore Technologies MinION, we have optimized protocols for RNA extraction, sample validations, library preparation for sequencing, and pathways for data analysis. This project has allowed us to monitor SARS-CoV-2 variants within our local community and introduce sequencing technology to Louisiana Tech University. We look forward to using these tools and techniques in future projects, where monitoring changes in gene expression can deepen our understanding of stem cell biology.

Poster #39

Comprehensive Sampling Clarifies Slimy Salamander Distributions and Reveals Potential New Species

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Accurate knowledge of species' distributions is necessary for research and conservation. Characterizing distributions requires geographic sampling, but how coarse or fine the spatial scale of sampling is can affect delineation of range boundaries, identification of hybrid zones, and detection of species with restricted distributions. Slimy Salamanders tend toward small geographic ranges, and have a propensity for hybridization, necessitating fine-scale sampling for accurate representation of species distributions. Our current understanding of the distributions of many Slimy Salamanders is based on old information and coarse sampling. Additionally, several recent studies have questioned the validity of some species, calling for more geographic and genetic sampling to confirm the species in this group and their distributions. Toward this, we sequenced the mitochondrial *ND2* gene of 386 individuals from 288 localities, representing four species of Slimy Salamanders occurring west of the Mississippi River. We found a much larger distribution for *P. kiamichi* than previously thought, including several potential hybrid zones with *P. albagula.* We found the Ouachita River separates *P. kisatchie* and *P. albagula* in southern Arkansas. Our data also suggest *P. sequoyah* from the type locality are hybrids with *P. albagula*. Lastly, we found evidence of an undescribed species, although more genetic sampling is required to confirm this. With these findings, we will update distribution maps to better inform researchers and conservation agencies. Both *P. kiamichi* and *P. sequoyah* are considered imperiled so our results will allow for status updates of these species and more effective conservation actions.

Poster #40

Carotenoid Status is associated with Body Mass Index and Overall Diet Quality

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Authors did not want abstract published.

Poster #41

The Influence of Microgravity on Notch Signaling and Adult Stem Cell Osteogenesis

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Human-adipose derived stem cells (hASC) are undifferentiated cells that have the ability to self-renew and differentiate into specialized cell types. Human ASCs are extremely abundant and easy to access through minimally invasive methods, leading to an increased interest in these cells for the study of development, degenerative disease, and potential for clinical applications. Stem cells provide an opportunity to combat challenges associated with bone health, especially those associated with space travel. After long periods of time in the International Space Station, astronauts experience a loss in bone density due to the absence of stimuli provided by Earth's gravity, causing their bones to become fragile and putting them at a higher risk for complications after returning to Earth's atmosphere. To fully understand the potential of hASCs, we must first gain a better understanding of how these cells behave, how they are influenced by their environment, and what ultimately drives their fate. We are monitoring changes in stem cell behavior when hASCs are cultured under standard conditions or simulated microgravity. Using a random positioning machine, we can grow cells in a simulated environment and monitor cell proliferation over time, quantify properties of self-renewal, and begin to explore changes in differentiation potential. Preliminary data suggests there is a decrease in cell proliferation when cells are cultured in simulated microgravity. Further studies will help us to understand why this is and work towards developing strategies to address it for the treatment of degenerative disease, atrophy, and injury.

Poster #42

Production of Polyvinyl Pyrrolidone (PVP) Scaffolds Containing Zinc Oxide and Halloysite using Solution Blow Spinning

Anthony Monistere, David Mills
School of Biological Sciences

In micromanufacturing, many different technologies for wound healing using fiber fabrication are currently being investigated, especially blow spinning and electrospinning. These techniques allow for the production of fibers on the micro and nanoscale, which act as scaffolds for cellular differentiation. These technologies are also being examined for application in portable wound care and internal sealants in surgical settings. The setup involves loading a syringe with a prepared polymer solution, using a pump to pump the fluid from the syringe constantly, applying either a pressurized gas (blow spinning) or voltage (electrospinning) onto the nozzle tip, and gathering the solidified polymer on to a collector. This study will involve dissolving the zinc oxide and halloysite nanotubules in ethanol and blow spinning to fabricate nanofibers. During this experiment, the experimenter will manipulate many parameters, including ethanol concentration, PVP concentration, molecular weights, voltage, and injection rate. After obtaining samples using a mix of the above parameters, the solidified polymers will be investigated for solution and processing parameters using SEM, DSC/TG, XRD, and FTIR. Once these parameters have been maximized, the experimenters will assess cellular response using standard cell behavior methods to the ZnO and HNTs scaffolds. Further, scaffolds will be tested for scaffold strength, biodegradation, solubility, and thermal properties. This experiment aims to investigate the use of PVP and ZnO / HNTs using these technologies and their effects on cells within this setting.

Poster #43

Spread and Growth Mechanisms of Chinese Tallow (*Triadica sebifera*) Trees in Fire Regulated Slash Pine (*Pinus elliottii*) Flatwoods of the Gulf Coastal Plain, USA: Effects of Microtopography and Prescribed Fire at Stand Level

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Chinese tallow invasion has become a serious ecological threat to the sustainable developments of native forest ecosystems in the Gulf Coastal Plain of the United States. Therefore, understanding the mechanisms of Chinese tallow invasion and establishment processes and evaluating the interactions between tallow invasion and native ecosystem resilience have become very important. In this study, invasion and establishment process of Chinese tallow and effects of prescribed fire and microtopography on those processes were studied through analyzing the invasibility filters, disturbances, and microtopography in three tallow infested stands established in 2016. Spatial analysis and modeling methods such as paired correlation function, rhohat function, and point process model were used to analyze the effects of microtopography and invasibility filters on the tallow invasion. The results indicate that within forest stand, low elevation flooded area has more tallow saplings and large trees that are clustered together and repelled with overstory pine trees. Overstory canopy closure, understory vegetation cover, distance to overstory trees, distance to rill, distance to habitat edge, and elevation are significant invasibility filters to tallow invasion. Meanwhile, under the same prescribed fire regimes, tallow trees located at low elevation flooded area have lower burn probability (p<0.01) compared to those at non-flooded area. With infrequent prescribed fires (burn interval ≥ 4 years), tallow trees have higher probability (p<0.01) to transfer from saplings to large trees (seed trees) within pine flatwood. However, when there are frequent burns (burn interval ≤ 2 years), the growth of tallow trees is limited at sapling stage (shrub stage) without seed production at high elevation non-flooded area because of high fire intensity compared to low elevation flooded area.

Poster #44

Sugar-Iodine as a Cheaper and Safer Alternative to Copper Sulfate to Increase Equine Hoof Health

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Horses that are kept in pastures, especially in wet or damp conditions, can develop many problems associated with their hooves. As the hooves carry the weight of the horse, it is important to keep them healthy. Copper Sulfate ($CuSO_4$) is a popular chemical on the market used to treat these issues. It has been proven effective; however, it is fairly expensive and not safe for the owner to use without eye/skin protection. Sugar-Iodine (SI) is an anecdotal treatment that is cheaper but has not been proven effective like $CuSO_4$. The objective of this study was to determine if SI can be used as a cheaper and safer alternative to $CuSO_4$, while still being effective. Therefore, sixteen horses at the LA Tech Equine Center were allotted to receive either $CuSO_4$ (n=6), SI (n=6) or nothing (control, n=4) for a 6-week period. On average, hoof scores for each group were similar at the beginning of the study. All horses were kept in similar conditions throughout the study and all horses' hooves were cleaned daily. Treatments were administered 3 times/week and every Wednesday horses' hooves were scored based on a numerical scale from 0-5 with 0 being healthy (no hoof defects) and 5 being unhealthy (thrush, seedy toe, cracks, deformed frog shape and overall sole health). Although no differences ($P>0.05$) were seen between treated horses ($CuSO_4$ or SI) over time, by the end of the study horses treated with either SI or CuSO4 had healthier hooves ($P=0.04$) than controls. In conclusion, using Sugar-iodine to treat horses' hooves is a cheap, safe and effective alternative to $CuSO_4$.

Poster #45

Next Generation Sequencing Provides Pathogen Monitoring to Rural Communities

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Widespread pathogens mutate faster than the methods used to detect and monitor them. To adequately monitor and intervene in these public health crises, novel approaches to pathogen surveillance must be utilized. Genetic surveillance is one such approach and is an integral part of pandemic readiness. Through this, generated data allows communities and institutions to monitor mutations and adapt to spreading pathogens. Through this, communities can adopt prevention strategies to decrease and contain future outbreaks. During the SARS-CoV-2 pandemic, our lab in partnership with LSUHS-Shreveport, Grambling State University, and Mercer State University, established a viral surveillance program to monitor circulating variants of SARS-CoV-2 in Lincoln Parish. Our approach sought to utilize newly accessible genetic sequencing methods to generate high-quality local genomes within 10 days of sample collection and include full metadata with each. We extracted viral RNA and performed PCR to confirm viral presence. After confirmation, we utilized library preparation protocols via multiplexed amplicon generation and sequencing. After analysis, assembled genomes and accompanying metadata were uploaded to GISAID for use by other researchers. From July 2021 to September 2022, we analyzed 295 patient samples and identified 33 unique variants, some among the first few thousand cases identified in North America. Through our approach, we implemented a viral surveillance program and successfully monitored circulating variants and mutations. We are expanding our use of these skills to advance our ongoing research in stem cell biology so that we may continue adding to a scientific community interested in improving health outcomes.

Poster #47

The Effects of the Notch3 Signaling Pathway on Cellular Secretions

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The field of regenerative medicine is working towards using stem cell-based therapies to help patients afflicted with degenerative disorders. Adipose-derived stem cells, like all stem cells, can self-renew and differentiate. In addition, HASCs can be extracted from adult fat tissue, meaning they are both plentiful and easy to access. As cells are used more in clinical settings, understanding what factors influence behavior becomes critical to their use. Cells respond to and influence their environment via activating intracellular signaling cascades and the external secretion of signaling factors. Our interest is in understanding how the Notch3 signaling pathway, a highly conserved pathway involved in proliferation, differentiation, and apoptosis, influences cellular secretion profiles. We utilized siRNA to decrease cellular production of the Notch3 protein, thereby perturbing the signaling cascade and any terminal secretion profiles of those cells that might be influenced by Notch3 activation. Following the knockdown, we collected media from those culture dishes and used it to culture hASCs that had not been exposed to siRNA. Using Notch3 siRNA conditioned media and negative control conditioned media, we visualized cells and measured cell behavior using a colony forming unit assay to monitor self-renewal, an alamarBlue assay to monitor cellular metabolism, and ki-67 expression levels to monitor DNA replication. Overall, utilizing the Notch3 siRNA conditioned media in cell culture should result in a lower proliferation of cells compared to cells cultured in negative control siRNA media. Lower proliferation data would suggest that the Notch3 signaling pathway influences the extracellular environment.

Poster #49

Effects of Leaf Diversity on Stream Invertebrate Abundance and Diversity

Joseph Aubert, Julia Earl
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Streams are important ecosystems vital for inland aquatic life. Leaves provide a major source of energy for stream invertebrates, which further serve as important food sources for aquatic predators. Leaves can vary widely in many chemical and physical characteristics. These characteristics are known to affect aquatic invertebrate abundances and diversity, as well as major stream ecosystem processes such as leaf decomposition. In temperate forests, there are many leaf species which can fall into streams, though it is not yet clear what role leaf litter diversity plays in these processes. This study seeks to answer if leaf species richness and average leaf traits can affect stream invertebrate abundance and diversity. I created mesh leaf litter bags containing 3, 5, 7, and 9 leaf species to establish a species richness gradient from low to high. In creating each mixture, I ensured leaf species richness did not significantly correlate with average leaf traits. I then put these mesh leaf bags into three streams and retrieved them at three time points. I found that invertebrates from 12 orders across 23 families colonized these leaf bags, with the most numerous being fly larvae in the family Chironomidae and amphipods in the family Hyalellidae. Colonizers also included stoneflies, caddisflies, mayflies, beetles, isopods, and crawfish, among others. I found significant relationships with leaf diversity and colonizer abundances. This may indicate that changes in tree species diversity in forest stream ecosystems may affect aquatic biodiversity.

Poster #50

The Sublethal Impacts of Fipronil on Aquatic Trophic Cascades and Periphyton Biomass

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School of Biological Sciences

Exposure to sublethal pesticide concentrations can reduce animal life expectancy and affect multiple behaviors such as foraging or finding mates. These behavioral alterations can decrease feeding and alter prey responses to predators. This is important because these responses affect the magnitude of trophic cascades which can alter the function of aquatic communities. Although it is important to know how pesticides affect these behaviors and trophic cascades, limited studies have been performed that isolate how pesticides affect behaviors in community level experiments. Once such trophic cascade occurs between snails and crayfish, red swamp crayfish (*Procambarus clarkii)* are predators that consume and reduce the feeding responses of snails (*Physa acuta*) that are a main consumer of periphyton algae. To examine how sublethal pesticide concentrations influence this trophic cascade, we conducted a 14 day experiment using a 2 x 3 factorial design consisting of two pesticide treatments (control; fipronil 1 ug/L) and three trophic level treatments (snails, crayfish and snails, caged crayfish and snails) and measured periphyton biomass. Results thus far show fipronil and trophic treatments had no significant effects on periphyton biomass and snail consumption. However, the presence of sand on periphyton tiles is a confounding variable which impacts our conclusions. The alteration from fipronil on predator prey behavior does not appear to significantly impact trophic cascades in this system, but further investigation of other measured behavioral variables is required.

Poster #51

Halloysite Polydopamine Nanohybrids to Treat Multidrug-Resistant Bacterial Infection

Mohammad Jabed Perves Bappy, David K Mills
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Once bacteria attach to a surface, they create a protective biological layer known as a biofilm, a physical barrier that makes bacteria highly resistant to antibiotics used to combat infections. The antibiotics currently in use also suffer from systemic toxicity, short half-life and have led to the emergence of multidrug-resistant (MDR) bacteria. The control and inhibition of microbial contamination are of critical importance for patients undergoing dental or orthopedic surgery. For serving military personnel, protracted military missions, where soldiers are in close contact and with their equipment for long periods, a situation that encourages infectious outbreaks. In combat casualty and civilian care, a critical requirement is the prevention of bacterial growth and local and systemic inflammatory responses to indwelling catheters and tubing used for dialysis or urinary drainage. The impact of MDR bacteria on society can be significantly reduced through innovative approaches that inhibit bacterial adherence and prevent biofilm formation. We propose the development of clay-based photothermal agents that can be used in various photo-driven applications through various fabrication methods. Our outcome includes infection prophylaxis and disease prevention, a significant reduction in infections that lead to morbidity and mortality, and effective management/prevention of trauma-related infections during future conflicts. Furthermore, all nanohybrid constructs can be used for antimicrobial protection in humanitarian and military installations and civilian healthcare institutions. Specific aims include photoreactive nanohybrid development, material characterization, photothermal analysis, and antibacterial growth inhibition.

Poster #52

PVA, Chitosan/Cellulose and Metalized Halloysite Nanotube (mHNT) Antimicrobial Films and Packaging

Gerard Sapena, David Mills
School of Biological Sciences

Global contamination is one of the greatest problems of our future, and one of the main causes is the usage of non-degradable petrol derive plastics. In the future of us, we must find ways to decelerate and stop the production and usage of these plastics. Despite the challenge that this creates To address this challenge, Dr. Mills' laboratory is actively engaged in developing various technologies that can substitute the use of traditional plastics with biodegradable polymers. The project that I conduct is the development of a biodegradable film with antibacterial properties, these properties allow us to reduce the post-harvest degradation effects and prolong the freshness of our food products. For the formation of these films chitosan is used as the biopolymer, PVA which is a water soluble polymer, and Metal halloysite nanotubes which give strength and more antibacterial effects to the film. The ideal combination of these components will be determined through rigorous testing to determine if it has similar mechanical properties compared with plastics, and also if the chemical properties are capable of stop those undesired effects to keep our products fresh. This thesis project aims to develop biodegradable polymers as an eco-friendly alternative to traditional plastics used in packaging applications. The increasing amount of plastic waste and pollution has led to a growing need for sustainable packaging materials, and biodegradable polymers have emerged as a promising solution.

Poster #53

Airborne Microplastics in Carson-Taylor Hall, Louisiana Tech University, Ruston, LA

Emilee Doyle, Sarah Bollinger, Garrison Lowder, Terri J. Maness
School of Biological Sciences

Microplastics (defined as plastic particles from 1-5mm in size) are widespread environmental contaminants that have been found in all parts of the globe from the depths of the Mariana Trench to the top of Mount Everest. Because microplastics are small, they can be airborne. Yet little is known about the distribution and seasonality of airborne microplastics. We investigated the presence of airborne microplastics in Carson-Taylor Hall on the campus of Louisiana Tech University in Ruston, LA. We predicted that more frequented areas of Carson-Taylor Hall would have more airborne microplastics than less frequented areas. To test this hypothesis, we placed 2.5L beakers in various locations around the building in areas with varying degrees of traffic, from less frequent (faculty offices and labs) to frequent (hallways, classrooms, and bathrooms). These beakers were in place for four days to allow the deposition of microplastics from the air to occur. We present our preliminary results here. Microplastics can impact human health when they are inhaled. Our results will help us understand the type and frequency of airborne microplastics in campus buildings and can be used to inform possible mitigation strategies.

Poster #54

Exploring Microplastic Ingestion by Louisiana's American Woodcocks (*Scolopax minor*)

Sarah Bollinger, Emilee Doyle, Kaiden Morace, Aspen Frazier, and Terri J. Maness
School of Biological Sciences

Plastic pollution has become a global threat to wildlife, especially in aquatic systems. Most of what we currently understand about this issue comes from studies of marine systems. Much less is known about this problem in freshwater systems. We investigated microplastic ingestion by American woodcocks (*Scolopax minor*) that were donated to us by hunters in the Boeuf Wildlife Management Area (WMA) in Caldwell and Catahoula Parishes. All birds were collected during the 2022-23 hunting season. The Boeuf WMA is a 51,000-acre area comprising wetlands, bottomland hardwoods, and cypress-tupelo swamps. Woodcocks probe moist forest floors with their long bills in search of earthworms and other invertebrates. Our study is the first ever to investigate microplastic ingestion in this wetland species. Considering the prevalence of microplastics observed and recorded in the GI tracts of waterfowl by our research team, we predict that we will find microplastics in the woodcocks' GI tracts. To test this hypothesis, we dissected and removed their GI tracts, then dissolved them in lye, and isolated microplastic with sieves. This isolated material was scanned under a dissecting microscope and any microplastics present were noted by type (fiber, film, foam, fragment, or nurdle) and color. Here, we present our preliminary findings from nine woodcock specimens. Our results are vital for a comprehensive understanding of the risk microplastics pose to wildlife in our freshwater systems.

Service-Learning Projects

Poster #8

Leisure Experiences of Older Adults in Long Term Care Facilities: Connecting Curriculum, Theory, and Research to Service Learning and the FCS Body of Knowledge

Bethany Joiner, Dr. Amy Yates
School of Human Ecology

The purpose of this service-learning project was to gain a greater understanding of the leisure experiences of older adults in long term care facilities (LCFs), as well as the best practices for meeting their social, emotional, mental, and physical needs through these leisure activities. This understanding was achieved by applying course content and independent research with faculty mentorship to a supervised field experience in a geriatric facility. Through direct care and hands on experience, a greater comprehension of using desirable leisure activities to positively impact residents' social, emotional, and mental well-being, as well as their influence on the transition into LCFs, was achieved. Service learning and focused research can equip students to address contemporary issues upon graduation, such as successful aging in later life. The primary implications for participants in service-learning experiences include identifying future career paths as academicians and/or practitioners. Furthermore, the establishment of strong community-based service-learning relationships allow for cutting-edge theory and research to permeate into the university's local community. With the increasing societal demands for the care of our aging citizens, this service learning and guided research project is particularly impactful.

Poster #46

Using Horses to Teach Life Skills to At-Risk Youth While Developing Civic and Social Responsibilities in College Students

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Equine-assisted therapy uses horses to promote human physical and mental health and has been used to treat anxiety, ADHD, eating disorders, depression, and many other mental health conditions. Service-Learning (SL) in higher education has proven to be an effective strategy that affords students the opportunity to expand their educational experiences while at the same time promoting their civic and social responsibility. Each fall, students in ANSC 220 "Introduction to Horsemanship" work in groups to develop lesson plans that utilize equine activities to help at-risk youth build various character traits and life skills. Our community partner for this SL project is the Outdoor Wilderness Learning (OWL) Equine Center located in Dubach, LA. The target audience for this class are teenagers from the Louisiana Methodist Children's Home with a history of abuse and/or neglect. For their lesson plans, students pick a theme (such as teamwork, communication, trust, sharing, respect, compassion) and then put the lesson plans into action with the OWL youth during one of their regular sessions with the horses. Following the activity, the students are required to 1) fill out a survey and 2) write a reflection paper about their experience. Survey results (n=86 students over a multiple year period) showed that overall students felt that the SL project was beneficial for both the at-risk youth as well as the students themselves (4.4 on Likert Scale (LS) where 1=strongly disagree and 5=strongly agree). Although the SL project did not cause students to consider a change in career path (2.5 on LS), they did feel that the project motivated them to want to help other less-fortunate people in their communities (4.5 on LS) after graduation.

Poster #48

Exploring the impact of developmentally appropriate parenting on family unit bonding during family vacations at a theme park: My Disney College Program

Annaclaire McFarland, Julie Rutledge
School of Human Ecology

During my 5-month Disney College Program experience, I applied Human Development and Family Science (HDFS) theory-to-practice of what I have learned through HDFS courses onto real-life observations of families vacationing at Disney World. Throughout this time, I had the opportunity to closely observe a wide range of family units and people as a Disney cast member. For this service-learning project, I explored the impact of how being outside of a typical routine (i.e., Disney World vacation) impacts aspects of family unit bonding including communication, closeness, and caregiving as well as through the additional lens of developmentally appropriate parenting. Examples of my observations have been thematically grouped into one of the three previously mentioned family unit areas. Examples include: (1) a parent calmly communicating in easy-to-understand, developmentally appropriate terms the reasoning behind a park rule or a family rule that the child was disappointed about; (2) close-knit families where parents expressed genuine interest in their children's favorite things and actively participated in them; and (3) ways that parent responded to their child if something in/on the attraction was too scary for them and the child's reaction based on the response (e.g., comforting, dismissing). Working as a Disney cast member during the fall and winter seasons gave me ample opportunity to observe and critically think about what I had already learned during my studies and apply them to real life situations.

Poster #55

The Important Interaction between LaTech and The OWL Center

Matthew Price, Rebecca McConnico
School of Biological Sciences
School of Agricultural Sciences and Forestry

My poster will be discussing the relationship between Louisiana Tech and the OWL Center. Louisiana Tech provides a great pre-veterinary program, while completing this curriculum there are many opportunities to work with animals that reside at the OWL Center. The Outdoor Wilderness Learning Center (OWL Center) is a program of the Louisiana United Methodist Children's and Family Services, Inc in Lincoln Parish. Students working with these animals not only provides hands on experience to them, but also shows students some of the responsibilities that comprise being a large animal veterinarian. Attaining this experience at the OWL Center is two-fold, the OWL Center also benefits by receiving free help from knowledge hungry students. Students mainly learn basic techniques with large animals such as hoof cleaning, common restraint, medication administration as well as blood withdrawals all under the direct supervision of a veterinarian. The direct supervision from a veterinarian is very important, because they can show common mistakes, helping the student learn from mistakes before they are even made. This relationship between Louisiana Tech and the OWL center is also important because the community benefits from the help provided by the students, and the students can learn in this process.

Poster #56

Arbor Trails Through Kiroli Park

Mason Goodrich, Joshua Adams
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Kiorli Park is a part of the West Monroe park system and the City of West Monroe has been wanting more connection between its visitors and the trees. After visiting with the curator, an idea was agreed upon to design a trail letting visitors explore the expanses of the park while also learning about the suite of tree species. Over the fall quarter, we created three different paths and mapped unique species along the route. The paths were 1.9, 0.65 , and 0.4 miles long. This allows a walker to choose their desired length while still learning about different trees species. Currently we have each tree mapped with GPS coordinates and have a google earth map that has been provided to the park. The next step will be creation of information plaques for placement along the trails.