

Welcome to the 19th Annual PURE Symposium “Fall Session”!

Thur Nov 9th, 2023, LSF 205

Snacks 3:45, Talks begin at 4:00pm



This Semester’s Presentations and Speakers:

4:00 – 4:15pm:

Inflammatory Factors Promoting Neuroblastoma and Mechanisms to Potentially Reduce its Progression.

Student: Matthew Behling. **Faculty Mentor:** Dr. Janay Vacharasin

(With work from: Andrew Ackerman and Brock Earley)

Neuroblastoma is a disorder of the nervous system that affects nerve cell precursors called neuroblasts. This is a strongly invasive type of cancer that typically arises from the adrenal glands and metastasizes to other parts of the body. There are environmental neurotoxicants that can lead to tumorigenicity and health risks. The scope of the research is to determine what exactly is occurring at a cellular level, and to determine by mass spec to properly identify the tumorigenic chemical byproducts. Preliminary results in SH-SY5Y cells have shown that the chemical byproducts are tumorigenic and lead to increased cellular migration (which on a macroscale could lead to increased metastasis). These findings indicate that there are chemical byproducts in the water that are potentially carcinogenic. This is a health and safety concern for the residents of Georgetown, SC, and indicates some form of environmental toxicant. However, more trials are underway to reinforce the data conducted in our trials. We have a novel Naphthalimide-based therapeutic compound that selectively targets tumorigenic cells and potentially returns oncogenic biomarkers (such as ID2) back to benign or normal levels.

4:15 – 4:30pm:

Shark Week: An Intensive Summer Research Program at the Coastal Marine Education and Research Academy.

Student: Nacole Blackmon **Faculty Internship Coordinator:** Dr. Tamatha Barbeau

Sharks have survived for millions of years, and have even survived several mass extinctions. They occupy a wide range of habitats, in every ocean, and they help maintain ocean biodiversity by regulating the populations of prey species. Because of overfishing, anthropogenic activities, climate change, and the demand for shark fins, shark populations are in danger and have been declining. Sharks now represent the largest group of threatened marine species on the World Conservation Union’s (IUCN) Red List of threatened species. The Coastal Marine Education and Research Academy (CMERA) for Sharks and Rays is an intensive and immersive program that provides students with research training, and hands-on experience, in working with marine wildlife. Research techniques gained involve learning how to safely handle, tag, and to collect specimens for DNA analysis. Students who participate in CMERA’s research program contribute to ongoing research that helps in the conservation and understanding of these incredible animals.

4:30 – 4:45pm:

Longnose Gar (*Lepisosteus osseus*) Shape Variation in a Large Atlantic Coastal Plain River.

Student: Ian Fisher **Faculty Mentor:** Dr. Jason Doll

The longnose gar *Lepisosteus osseus* is a fusiform primitive fish that show sexual dimorphism. Longnose gar are native to the Great Pee Dee River, South Carolina and widely distributed across central and eastern United States. The Great Pee Dee River enters South Carolina as a single channel, sinuous river near the North Carolina Border. As it flows downstream it changes to an anabranch system near the confluence of the Waccamaw River. This change in morphology of the river could affect the shape of the fish based on variable stream flow. We collected longnose gar from three different locations along the Great Pee Dee River, upper section, middle section, and lower section using standardized boat electrofishing. All fish were sexed by visual

examination of their gonads and measured for their total lengths (mm) and weights (g). Geometric morphometrics was used to describe the shape of the gar using 19 landmarks. The shape of longnose gar was compared between the different areas of the river. The effect of total length and sex of the fish on shape was also evaluated. We found that there are small differences between longnose gar at each location. We also found differences in shape between the males and the females, and this relationship varies by total length. The differences between male and female seems to be that the longer males are slightly more rotund and that the females have longer snouts. Literature suggests females have longer snouts which is consistent with our results. However, our results differ in that we found sexual dimorphism in girth based on an interaction of sex and length. Previous work on longnose gar shape used truss analysis. This is the first study to apply geometric morphometric analysis to analyze shape variation of this species. And provides a more detailed evaluation of morphological differences.

The Department of Biology at FMU strongly encourages student participation in research activities. We offer many opportunities for undergraduates to assist in faculty research or develop their own independent research projects. Students can earn academic credit through Special Studies (BIOL 497) and Honors Independent Study.

If you are interested in learning more about PURE or available research opportunities, scan the QR code below. You can also contact Dr. Barbeau (tbarbeau@fmarion.edu), the coordinator of PURE, to answer any questions you might have and get you started on a research project!

