

Life in plastic... not so fantastic

Miranda Dziobak, 2022 Bossart Scholarship Winner

In 2022, I was the recipient of the Gregory Bossart, One Health Memorial Scholarship. I am currently a PhD student at the University of South Carolina studying Environmental Health Sciences. My dissertation centers around understanding bottlenose dolphin exposure to harmful chemicals polluting their environments. There are many benefits to studying dolphin exposure; dolphins are apex predators with long lifespans making them sensitive gauges for detecting disruptions to their natural environment. Additionally, dolphins and humans recreate in the same waters and consume similar species of fish, so chemical exposures and potential health impacts identified in dolphins may be relevant to humans as well. My project includes four total objectives, with the first investigating whether we can connect dolphin phthalate exposure with microplastic ingestion and investigate prey fish as potential sources of microplastic exposure. Phthalates are a class of chemical additive that are commonly found in plastic products. As larger plastic debris breaks down, it can release these chemicals into the environment. We know from previous research that dolphins are exposed to phthalates, but the source of exposure is currently unknown. We suspect a plastic origin, but as dolphins are selective feeders, we do not expect them to be targeting large plastic debris as a food source. Instead, we wonder if common prey fish, who may be less selective in feeding strategies, could be the source of plastic through trophic transfer. In other words, if fish are contaminated from the plastics they eat, then dolphins who eat those fish could also become contaminated with plastic. To complete this objective, I first needed to characterize phthalate exposure in both dolphins and their common prey fish. Funding from this scholarship was used to purchase the materials necessary to determine phthalate exposure in both species, thus addressing my dissertation aim. This funding also provided the financial means for me to attend and participate in dolphin health assessments conducted by the Sarasota Dolphin Research Program which was an amazing opportunity.

Beyond the direct support this scholarship provided for my dissertation work, this scholarship also provided opportunities for me to further other personal development goals related to teaching and mentoring. Following the completion of my doctorate, I plan to teach and conduct research at a higher education institution. Currently, my lab work is conducted through the College of Charleston which is largely comprised of undergraduate students. This scholarship experience has afforded me the opportunity to engage with students who share an interest in my research, allowing me to collaborate with them, provide guidance, and foster their professional growth. Furthermore, the scholarship provided funding for attendance at international conferences, enabling me to disseminate my research findings and engage with peers and professionals on a global scale.

I am very grateful to the Dr. Gregory D. Bossart Memorial One Health Scholarship committee, the Georgia Aquarium, and the One Health Commission for supporting my work. This assistance has played a significant role in making my academic pursuits possible.



Miranda with her advisor, Dr. Leslie Hart, and lab mates during health assessments conducted by the Sarasota Dolphin Research program to collect dolphin urine samples for phthalate metabolite screening



Miranda and her advisor, Dr. Leslie Hart and lab mates with fish they screened for phthalate contamination