GRO Summer Internship Final Report

Embryonic Development of *Fundulus heteroclitus*
"Putting the Fun in *Fundulus*"

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My first day at the US EPA National Health and Environmental Effects Laboratory, Atlantic Ecology Division in Narragansett, RI began with the usual introductions and paperwork and ended with the promise that by the end of the summer I would know the schedule of the moon like the back of my hand. It just so happens that the species of fish I would be working with, *Fundulus heteroclitus*, or Atlantic killifish, only spawn on the new and full moon, and I soon came to realize that this meant my personal schedule would be dictated by the phases of the moon as well. Under the guidance of research scientist Diane Nacci, I began working on a project that would attempt to provide a database for future genetics research on Atlantic killifish. This project, "Embryonic Development of *Fundulus heteroclitus*," consisted of collecting newly-spawned eggs from fish tanks in the wet lab, staging them on a daily basis, and archiving them on set days to record their development. Photographs of the embryos were also taken on archiving days for future reference.

My work was part of a larger project that aims to understand the genetics behind PCB tolerance in a specific population of killifish found in New Bedford Harbor, MA. New Bedford Harbor was named a Superfund site in 1982, and although toxic waste from the textile industry is no longer being actively dumped in the water, the sediments and many of the organisms that live there are highly contaminated. Surprisingly, within only a few decades the resident population of killifish seems to have acquired a resistance to the detrimental effects of these toxins on reproduction and development, and current research is trying to determine the genes that are responsible.

I had only a brief background in genetics and population ecology before starting this internship, but after being around researchers immersed in these areas I began to feel more comfortable with the subject material with which I was dealing. This was also my first time working with live fish, and I can honestly say it was much more challenging and rewarding than I had thought it would be. I became familiar with basic fish care, microscope and camera use, record keeping, and archiving techniques, while also learning more about genetics and toxicology.

In my final week, I put together a presentation for the branch using data and observations I had recorded as well as photos I had taken to document the development process. This was a good opportunity for me to present before an audience of fellow researchers and exercise my communication skills with other scientists. The feedback not only from my presentation but throughout the internship was very valuable, and helped me assess which skills I possess and which skills I could stand to improve. Every researcher I met was beyond helpful, and expressed a genuine desire for me to get the most from this summer experience. Although the internship did not change the direction I plan to pursue in graduate school, it did give me more appreciation for just how many venues of research there are available to students who are willing to work hard and embrace new challenges.

If there's one thing you take away from an internship in a wet lab, it's that live animals rarely adhere to your set protocols. There were times when the amount of eggs collected from the tanks was less than optimum, and other times when a series would have to be skipped altogether. Fortunately there is always another lunar cycle to look forward to, and our wet lab team was very flexible with scheduling to allow us to make up for lost numbers. In the end we were able to complete the project on time, and I was able to leave knowing I had contributed

towards something much bigger than just a summer internship. To any and all future interns: make the most of your allotted time over the summer (it goes by unbelievably fast) and always be open to new opportunities. Volunteering to assist with other projects not only gives you more hands-on experience but could also introduce you to an entirely new field of research that may change your plans for future goals. All it takes is a little motivation on your part to discover these new possibilities!