

Genetic diversity and high-throughput genotyping in an estuarine fish, *Fundulus heteroclitus*

Jeffrey Markert (Providence College)

Project Location:

Providence College

Project Description:

Genetic diversity is a key predictor of population health in changing environments because it generates the phenotypic diversity needed to adjust to new challenges (pollutants, disease, and changes to the physical environment). In diploid species, genetic diversity also provides a buffer against problems associated with inbreeding depression and related processes.

Over the past few months I have started a collaboration with colleagues at the Environmental Protection Agency's Atlantic Ecology Lab in Narragansett RI. We are developing a large set of Single Nucleotide Polymorphism (SNP) markers for use on the widely distributed coastal fish species *Fundulus heteroclitus* (aka. killifish or mummichog). This fish is of particular interest because has evolved to thrive in highly polluted bays and estuaries, and much is has been discovered about the biochemical pathways that make this possible.

The SURF student selected for this project will be focused on detecting genetic differences among coastal populations using Providence College's high throughput Fluidigm genotyping system. The student will be involved with sample collection, DNA extraction, genotyping, and population genetic analyses.

*This project involves **both field & lab/computer work***

Required/preferred skills for student applicant:

In this kind of work, organization is key. Large numbers of samples will be processed and analyzed, and quality control is of primary importance in order to produce impactful, high-quality science. Patience and willingness to cheerfully explore a variety of approaches will also be an asset.

The student will learn DNA extraction methods, field sampling techniques, genotyping techniques, and data analyses.

Student transportation needed for project?

No

In general, the mentor can provide transportation to both field sites and collaborating laboratories. However a license to drive and eligibility to operate Providence College vans is helpful (though not absolutely required).