New MSc project starting in April 2021

Development and assessment of Environmental DNA (eDNA) for biomonitoring.

Project: The development of Environmental DNA (eDNA) coupled with Next-Generation Sequencing (NGS Metabarcoding) are new genomics techniques to assess the presence of organisms in the environment. This non-invasive method does not require direct capture of organisms, identification, and then release in the field. This will minimize the time and cost of traditional logistically complex and resource intensive community assessments and the pressure on potentially degraded environments. This project is novel as it seeks to compare the quantitative signal of eDNA abundance derived from targeted assays for fish and mussels using qPCR against relative numbers of sequence reads for the same taxon using metabarcoding to assess congruence between methods concerning relative eDNA signal strength and sensitivity. A successful candidate will compare target specific eDNA for individual species with metabarcoding eDNA signal strength, and also compare conventional fish community assessment techniques with new metabarcoding identification and signal strength as an estimate of abundance and diversity. Desired qualifications include the ability to balance working independently and collaboratively, excellent work habits, willing to work in remote locations and strong writing skills. Successful candidates will work within a team of researchers from the University of Guelph and Environment and Climate Change Canada in on-going biological monitoring programs of the aquatic environment.

Objectives: 1) Build capacity and develop Environmental DNA (eDNA) coupled with Next-Generation Sequencing (NGS Metabarcoding) as surrogates for fish and mussel community assessments; 2) Assess these tools in support of aquatic community assessments, and ground truth these techniques in on-going biomonitoring programs.

Additional Information:

- MSc-level funding for two years.
- Supervisors: Dr. Robert Hanner and Dr. Gerald Tetreault (Environment and Climate Change Canada)
- Requirements:
    - Satisfy the basic requirements for admission to the MSc program of Integrative Biology at the University of Guelph (https://www.uoguelph.ca/ib/graduate_home);
    - Bachelor's degree in Biology, Genetics, Ecotoxicology, Bioinformatics or Marine Biology or a related discipline;
    - Excellent knowledge in aquatic biology and ecotoxicology;
    - Good communication skill in English, a full class G driver's licence and willing to work in remote locations are assets.

To apply, send your CV and BSc transcripts to:

Dr. Robert Hanner
Department of Integrated Biology
University of Guelph, Guelph, Ontario
Phone: 519-824-4120 x53479
E-mail: rhanner@uoguelph.ca
https://www.hannerlab.net/home
http://www.uoguelph.ca/~hannerlb/Hanner_Lab_-_Home.html