

Environmental Genomics

Date: August 2–9, 2014

Location: MDI Biological Laboratory

Daphnia and killifish are used for training because of their growing use as model systems for environmental genomics and for improving environmental health protection, yet the skills learned during the course will be applicable to all study systems with mature genomics resources. The lectures and practical modules to be taught using open source analysis tools and existing OMICS data using environmental genomics model systems (i.e., *Daphnia*, *Fundulus*) are as follows:

Guest Seminar: Ecological Genomics, Theory and Practice;

Laboratory Training: RNA-Seq library construction;

Guest Lecture: Philosophy of Genome Science & Experimental Design Considerations;

Course Lecture: Introduction to the Sequence Data Workflow;

Workshop Presentation: Review of the sequencing technology, its strengths and its limitations;

Bioinformatics Training: Introduction to R (hands-on workshop);

Laboratory Training: Quality assurance tests of RNA-Seq libraries;

Bioinformatics Training: Visualization of sequence data for quality assurance (hands-on workshop);

Guest Lecture: Software Solutions for the Sequence Data Workflow & Their Applications for Environmental Research;

Synthesis Session: "Why not use _____ from the sequence data for my investigations?";

Bioinformatics Training: Visualizing complex data (presentation & hands-on workshop);

Robotics Training: Introduction to automation systems;

Guest Lecture: Genomic Variation in Evolved Toxicological Responses;

Synthesis Session: "Why not use _____ critter/organism for my investigations?";

Bioinformatics Training: Navigating the command line;

Workshop Presentation: Statistical considerations for analysing genome-scale data;

Bioinformatics Training: Data analysis workshop using R to analyse Tuxedo output (hands-on workshop);

Bioinformatics Training: Biological inference using pathway analysis (hand-on workshop);

Guest Lecture: Network Effects: Integrating Systems Approaches to Modelling Biological Processes;

Workshop Presentation: Exploring genome sequence variation;

Bioinformatics Training: Exploring genome sequence variation;

Guest Lecture: Conducting population genomics research;

Guest Lecture: Genome-Wide Quantitative Genetics;

Questions & Answers: "How do I obtain funding for my Environmental Genomics project?" plus a bit more...