

IEH Undergraduate Intern Mentoring Opportunity

Deadline: **March 14, 2014**

Name/Title/Institution(s) of senior mentor(s): Margo Haygood/Professor/OHSU

Name/Title/Institution(s) of frontline mentor(s): Hiroaki Naka/Senior Research Associate/OHSU

Project Title: Construction of mutants in biosynthesis genes for antibiotics in bacterium *Teredinibacter turnerae*, a symbiont of shipworms

Context for Project:

Shipworms are bivalve mollusks that live in and consume wood. They harbor bacterial symbionts in cells of their gills. These symbionts help digest wood, and also make antibiotics to prevent environmental bacteria from growing in the wood digestion organ. These antibiotics are likely to be better than current antibiotics because they have evolved to be effective without toxicity to the host. The genome of one of these bacteria contains many biosynthetic pathways that appear to code for antibiotic-like molecules.

Brief Description.

In order to understand this system and discover new antibiotics we are mutating each pathway by targeted in-frame deletion to allow comparison with wild-type extracts to facilitate identification of the compounds from each pathways.

Proposed Outcomes/Broader Impact:

This project will contribute to understanding the function of a group of animals that play an important role in marine ecology by degrading the massive amounts of wood that wash into the sea. We also hope that it will help identify new antibiotics to solve the current antibiotic crisis in human health

Proposed timeline (within a 10 week span):

Week 1: introduction to the laboratory, sterile technique, making media, select target pathway

Week 2-3: make and confirm mutation plasmids

Week 4-5: conjugation of plasmids and selection and confirmation of first recombinants

Week 6-7: selection and confirmation of second recombinants

Week 8-9: grow and extract mutant and wild type

Week 10: Screen extracts in growth inhibition assays against target bacteria (innocuous bacteria, no human pathogens)

Intern academic experience and skill set should include:

None required. Desirable would be any sort of bacteriology laboratory, invertebrate zoology, or classroom or lab classes in molecular biology or bacterial genetics.