

DENIN Environmental Scholars Internships

Dates of internship: Summer 2022

Location: Delaware Biotechnology Institute, University of Delaware, Newark, DE 19713

Number of positions available: 1

Faculty Mentor: Thomas Hanson

Graduate Student Mentor: Alexa Bennett

Professional Staff Mentor:

Project Title: The Delaware Microbiome Project – regional microbial communities across space and time.

Research Description:

Next generation sequencing technologies have provided rapid insights into microbial communities by allowing us to identify what microbes are present in a given sample at a given time. However, these methods provide little information on what microbes actually do in a given environment. This project will investigate microbial diversity across a range of Delaware habitats that differ in their degree of human impact and examine microbial diversity at a selected sites through time. The project will expose students to field sampling, laboratory molecular biology, and computational data analysis.

Research Questions:

What is the correlation between traditional microbial diversity markers (16S and 18S rRNA genes) and functional gene markers?

Are there distinct microbial communities associated with different geographic settings?

How much do microbial communities at the same sites change over time?

Student Learning Objectives: Professional and Research Skills

This internship focuses on the development of the following professional and scientific skills.

Broad Professional Skills	Specific Skills
Planning and time management	Ability to set and complete specific goals of varying scope
Work independently	Independent work ethic - work independently to problem-solve
Collaborative skills	Learning to complete tasks efficiently and effectively with others
Express ideas in writing and verbally	Communicate with diverse audiences - Development of impactful poster and oral presentations. Honing ability to deliver scientific results/impacts to people of interdisciplinary background.
Broad Scientific Research Skills	Specific Skills
Understand scientific terms	Correctly use terms and concepts from the fields of microbiology and molecular biology
Literature analysis	Ability to effectively find and utilize scientific manuscripts related to environmental microbiology
Use scientific tools	Microbial cultivation, microbial community analysis by next generation sequencing, bioinformatics
Recognize simple patterns in research data	Applying microbiology concepts to qualitative and quantitative data.
Apply research tools and techniques in research experiments	DNA isolation from environmental samples and isolates, PCR, and microbial growth assays to investigate Delaware River microbial communities.
Analyze research data	R, Excel, bioinformatics packages and instrument-specific software utilization to form effective figures and tables.
Understand, apply, and explain scientific concepts and theories	Freedom to form questions and plan methods for addressing challenges. Learning to effectively communicate results through oral presentations and manuscript writing.

Prerequisites:

Introductory experience with biology.

Work Environment and Expectations:

Laboratory environment: Delaware Biotechnology Institute. Hours are flexibly determined between student and mentor. Students will work full time during summer 2022. Students will participate in scheduled events for the UD EPSCoR program and participate in an end of program research symposium.

Stipend:

Funding Source:

National Science Foundation, Delaware EPSCoR Track I

How to apply: https://ugresearch.udel.edu/PUB_Program.aspx