



CBCB SEMINAR

10/18/2021

3:30-4:30PM

AP BioPharma

Room 140

(590 Avenue 1743)

or via ZOOM:

<https://udel.zoom.us/j/93442313974>

(Passcode: BINF865)

bioinformatics.udel.edu

BIOINFORMATICS SEMINAR

ALEXA BENNETT

PhD Student, Department of SMSP UNIVERSITY OF DELAWARE

THE DELAWARE MICROBIOME PROJECT

The Delaware Microbiome Project (DMP) aims to characterize environmentally relevant microbial communities within Delaware's waters, sediments, and soils. Uncovering the diversity and functionality of microbial life is crucial because they drive the fluxes of the elements essential to life on Earth. A high-throughput and cost-effective method for probing a microbial community structure is amplifying and sequencing phylogenetic marker genes. However, highly conserved phylogenetic marker genes do not tightly correlate with microbial functionality due to horizontal gene transfer. Alexa's project develops a complete and optimized workflow for simultaneously amplifying and sequencing taxonomic and functional genes. The amplification products target microbial community functionality in biogeochemical cycles (carbon, nitrogen, phosphorous, sulfur, and arsenic) in addition to prokaryotic and eukaryotic phylogenetic genes.

Microbial DNA is extracted from the samples collected by collaborators and laboratory members; the current range of our impact includes high school students, undergraduate, and graduate students, postdoctoral candidates, and primary investigators. Recent collaborations outside of the University of Delaware include Delaware Technical Community College and Delaware State University students.

The workflow optimized within this project reduced stochastic error by treating all sample collection and extraction equally and integrating liquid handling robotics. Moreover, Alexa is developing standardized bioinformatic tools for the computational analysis of sequencing data.

BIOGRAPHY

Alexa Bennett is seeking her Ph.D. in Bioinformatics Data Science. She conducts her research project under the supervision of Dr. Thomas Hanson from the School of Marine Science and Policy. She obtained a Biological Sciences A.A.S., concentration in Biotechnology, from Delaware Technical Community College (DTCC) and a Marine Science B.S., concentration in Marine Biology with a minor in Biochemistry, from the University of Delaware (UD). Her undergraduate research at DTCC focused on novel *Streptomyces* identification and characterization. Under the direction of Dr. Thomas Hanson, Alexa's undergraduate project attempted to cultivate and characterize Arctic tundra soil microorganisms with a particular interest in Acidobacteria.

Alexa Bennett was a laboratory technician at MIDI Labs, where she identified bacteria via Sanger sequencing and MALDI. She is certified in Lean Manufacturing and holds a Green Belt Six Sigma certification, a methodology driven by data and statistics to optimize a particular process.

Her current research is focused on Project WiCCED, Water in the Changing Coastal Environment of Delaware, Microbiome Core, specifically the Delaware Microbiome Project.



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