DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE SEMINAR SERIES
Spring 2020

DATE: WEDNESDAY, FEBRUARY 26, 2020
LOCATION: TIERNAN HALL LECTURE 1
TIME: 1:00-2:20 PM

GUEST SPEAKER
Dr. Erica Majumder
Assistant Professor of Biochemistry
Department of Chemistry
SUNY College of Environmental Science and Forestry
Syracuse, NY

TOPIC
AI-assisted prediction and testing of metabolite activity in environmental bacteria

ABSTRACT

Metabolomics, the study of the composition and flux of the small molecule population of any biological organism, presents a new ability to investigate environmental systems at a molecular level. One of the challenges of using high dimensional data from complex systems is the efficient analysis and meaningful interpretation in the given biological context. Artificial Intelligence and/or cognitive computing tools designed for scientific literature analysis can be employed effectively in the interpretation of 'omics data. We developed a new strategy using such AI tools to predict the function of small molecules and different species of bacteria in contaminated sediments. From the predictions, we set-up laboratory tests to assess the validity of the AI-predicted function. This seminar will cover examples from the use of metabolomics-based technologies to elucidate the functions and physiology of sulfate-reducing and nitrate-reducing bacteria in nuclear waste contaminated sediments.

BIO

Dr. Majumder is a new Assistant Professor of Biochemistry at SUNY ESF (Environmental Science and Forestry). Erica specializes in the mechanisms and consequences of novel microbial metabolisms in diverse environmental settings. Her work uses a combination of mass spectrometry for metabolomics and proteomics, protein biochemistry and genetic engineering. Dr. Majumder earned her PhD in Bioinorganic Chemistry working with Robert Blankenship at Washington University in St. Louis on solar energy capture, conversion and cycling in early-evolving phototrophs. She then started her postdoc in biochemistry with Judy Wall at the University of Missouri looking at the mechanisms of electron transfer in Sulfate-Reducing Bacteria leading to uranium reduction in nuclear waste contaminated field sites. Upon Dr. Wall's retirement, Erica moved to her collaborator Dr. Gary Siuzdak's lab at The Scripps Research Institute to complete her postdoc diving into the metabolomics and systems biology of the microbial communities in the same contaminated sediments. Dr. Majumder started her lab at ESF in August 2019. Our initial projects are looking at degradation of recalcitrant plastic polymers in wastewater treatment plants and the metabolic contributions of pathogenic fungi in tree blights.

Committee members:
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