PURDUE UNIVERSITY | Environmental and Ecological Engineering

EEE Research Seminar

Date: August 29, 2023 at 10:30 AM
Location: POTR 234 (Fu Room)

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Potential use of fungal-based systems for wastewater treatment and resource recovery

Abstract

Fungi are not only the major decomposers in nature, but they are also intimately involved in the biogeochemical processes underpinning metal and mineral transformations in the environment. Despite their unique properties and fundamental roles in the biotransformation of organic and inorganic compounds in nature, fungi have not been widely exploited for bioremediation processes and recovery of resources. My work is devoted to investigating the potential of fungal-based systems for different biotransformation processes in environmental and industrial applications. In this seminar, I will provide an overview of the characteristics that make fungal systems advantageous for bioremediation, waste treatment processes and biorecovery of high-value products. As an example of an application for wastewater treatment, I will discuss the ability of fungi to transform toxic forms of metalloids, e.g., selenium and tellurium, commonly found in mining- and refinery-impacted waters, into valuable products such as nanoparticles. I will also address the challenges of developing the next generation of fungal-based systems for wastewater treatment, which are envisioned to exploit the natural association and synergistic interactions that exist between fungi and other microbes (multi-domain systems) in natural environments.

Bio

Dr. Erika Espinosa-Ortiz is currently an Assistant Research Professor at Montana State University (MSU) in the Center for Biofilm Engineering. As a professional in the environmental engineering and technology areas, her work has been devoted to the development of alternative biological treatments for polluted environmental matrices including water systems. Dr. Espinosa-Ortiz has a background in Environmental Engineering. She received her PhD at UNESCO-IHE Delft Institute for Water Education in the Netherlands as part of an Erasmus Mundus Joint Doctorate Program on Environmental Technologies. Her research focuses on the use of fungi as metalloid-reducing agents and their potential application in acid mine drainage treatment. She specializes in biomineralization processes and biofilm engineering investigating the formation of bacterial, fungal, and algal biofilms in a variety of model systems, simulating medical, environmental, and industrial situations.