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Microbiome Engineering for Soil Health Improvement

Beyer Distinguished Lecture

Dr. Abdul Latif Khan

Assistant Professor
Department of
Engineering Technology
University of Houston

Seminar Details

2:30-4:00pm

UH Campus
Classroom & Business Building
Room CBB 110

Online via Teams
https://teams.microsoft.com/meet/28672503493418?p=0CX16bX3BZZ6J5ss6O

ABSTRACT

Traditional food production practices have deteriorated the quality of both soil and aquatic ecosystems. Using natural and bio-based strategies to address environmental issues is crucial for long-term sustainability and ecosystem resilience. In this context, microbes are the natural partners of the plant growth environment. The collection of microbes known as the microbiome has been described as a “second functional genome” made up of highly diverse and active microbial symbionts. My lab employs advanced molecular, genome sequencing, and bioinformatics techniques to better understand the functional roles of microbiomes. We consider the diversity of core-microbiome species to be a key factor in improving rhizospheric health. We analyze microbes' gene networks and biosynthetic pathways for producing beneficial metabolites and establishing strong symbiotic relationships to counteract stress factors and maintain a healthy soil system. Therefore, microbiome engineering can reprogram the negative effects of environmental stresses on plant productivity.

BIOGRAPHY

Abdul L Khan is an Assistant Professor at the Department of Engineering Technology, Cullen College of Engineering, University of Houston, USA. He received Ph.D. in Plant Eco-Physiology from the School of Applied Biosciences, South Korea. Over the years, his expertise has been in Plant-Microbe Interactions to understand molecular mechanisms and biosynthetic pathways involved in stress tolerance and productivity. His lab studies microbiome engineering to improve plant production systems with the least energy and carbon footprints. His lab is establishing a synthetic microbiome for healthy food and increased plant growth. He has been an Associate Editor of the Journal of Plant Growth Regulation since 2020.