

February 14, 2024 | Churchill Hall 103 | 12:00 PM

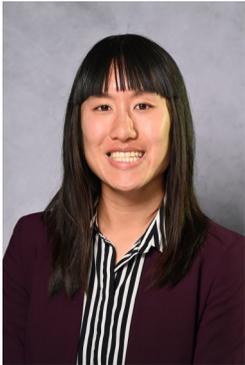
Distinguished Seminar Speaker

Engineering Microbial Communication for Sustainable Agriculture

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Abstract: Agriculture and the global food system accounts for ~30% of greenhouse gas emissions. Therefore, developing sustainable agricultural technologies is essential for combating and mitigating the effects of climate change. Microbes like bacteria and fungi play pivotal roles in agriculture and food security through complex interactions with plant hosts, other microorganisms, and their surroundings. Consequently, my research aims to investigate how these inter-species and cross-kingdom relationships could be ideal engineering targets for addressing current agricultural challenges. In this seminar, I will present my work showcasing the power of RNA and nanotechnology in manipulating microbial interactions with the environment and plant hosts. In the first part of my talk, I will examine how microbes respond to environmental stresses and the use of regulatory RNAs as a genetic platform to manipulate bacterial metal reduction capabilities for the

biosynthesis of nanoparticles with unique and enhanced functionality. Following this, I will then discuss host-microbe interactions and how exploiting RNA-based communication between fungal pathogens and plant hosts can inform next-generation, nanoparticle-based strategies for plant disease control. Together, these studies illustrate how understanding and controlling microbial communication will pave the way for new sustainable strategies for reducing agricultural chemical dependence, improving plant health, and enabling bioremediation technologies.

Biography: Angela Chen is a USDA-NIFA AFRI Postdoctoral Fellow in the Department of Microbiology and Plant Pathology at UC Riverside. Under Prof. Hailing Jin, she investigates the mechanisms of cross-kingdom RNA trafficking between plants and fungal pathogens to develop nanomaterials for RNAi-based disease control. Prior to UC Riverside, she received her B.S. in chemical engineering from the Ohio State University and her M.S. and Ph.D. in chemical engineering from the University of Texas at Austin. As an NSF Graduate Research Fellow with Profs. Lydia Contreras and Benjamin Keitz, she focused on engineering regulatory RNAs in extremophilic bacteria to control bacterial stress response for materials science applications. Outside of research, Angela is passionate about educating and empowering the next generation of engineers, having earned a Graduate Certification in Engineering Education. She is also the President of the Riverside Postdoctoral Association, where she leads initiatives focused on supporting postdocs and broadening STEM access through the creation of diverse and inclusive academic environments.
