



MICROBIOLOGY FACULTY CANDIDATE

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Microbial interactions within microbiomes: insights into their mechanisms and ecology through culture and quantitative 'omics

ABSTRACT

Symbiotic bacteria perform critical functions for their eukaryotic hosts ecosystems and engage in a variety of social behaviors including cooperative and antagonistic interactions. The outcomes of such interactions can have dramatic effects on microbiome structure, function, and host fitness. Strategies to outcompete, parasitize, and predate upon other microbes in the environment are prevalent within bacterial genomes, however we currently know little about the ecology of such interactions and how these bacteria differentiate between friend and foe. My work combines wet-lab and quantitative 'omics analyzes to elucidate the ecology and genetic mechanisms underpinning interbacterial interactions in vitro and in vitro in using both simple model systems and complex microbiomes as case studies. In my talk, I will discuss a project focused on intraspecific competition during symbiosis establishment. Although strategies for interbacterial competition are prevalent in host-associated bacteria, we know relatively little about how the host's physical environment impacts intraspecific competition and how cells make contact with one another in highly viscous host tissue. To better understand how cells respond to and contact one another in such environments I performed a genome-wide transposon mutant screen and quantitative transcriptomics on the type IV secretion system-wielding beneficial bacterial symbiont, *Vibrio fischeri*. My findings reveal *V. fischeri* use distinct mechanisms to regulate cell-cell contact and competitive behavior in response to habitat transition and further underscore the significance of the physical environment in directing complex bacterial behaviors.

Tuesday, March 14, 2023 - 11:10am
404D Biological Sciences Building