My lab's research aims to predict and modify behavior of microbial communities. Our work applies genetic and chemical analysis to elucidate interactions among microorganisms and between microorganisms and their host plants and insects. We have identified microbial interactions that are evident under field conditions, can be replicated under controlled conditions in the lab, represents the three dominant phyla in both the mammalian gut and plant rhizosphere (the Firmicutes, Bacteroidetes, and the Proteobacteria), and are genetically tractable so that the genetic and chemical bases for the interactions can be elucidated. Our studies focus on community behaviors that cannot be accomplished by any single bacterial species or pair.