MAR16-2015-002952 ET
Abstract for an Invited Paper
for the MAR16 Meeting of
the American Physical Society

The ecology and evolution of microbial behavior in complex communities

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Microbes form complex ecological communities with multiple species coexisting and interacting with each other. Often, the ecological interactions among these species are mediated by molecules that the microbes actively secrete to the outside world. A large number of microbes are decomposers, and thus particularly relevant examples of these secreted molecules are the enzymes that microbes use to break down complex organic matter (e.g. dead tissue) and extract nutrients from it. In this talk, I will present an overview of the work that we have done to understand the ecology and evolution of the genes responsible for the expression of these enzymes. In particular, I will discuss how by regulating the amount of investment in the production of extracellular enzymes, microbes may modulate ecological interactions and change the number and stability of equilibria in ecosystems.