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Cooperative behavior between soil bacteria

Abstract: The decomposition of soil organic matter (SOM) is a critically important process in global terrestrial ecosystems. SOM decomposition is driven by micro-organisms that cooperate by secreting costly extracellular enzymes. This raises a basic puzzle: the stability of microbial decomposition in spite of its evolutionary vulnerability to ‘cheaters’—mutant strains that reap the benefits of cooperation while paying a lower cost. Resolving this puzzle requires a multi-scale eco-evolutionary model that captures the spatio-temporal dynamics of molecule-molecule, molecule-cell, and cell-cell interactions. In this talk, I will present you such a model which can be derived from a individual-based stochastic model.