

Title: Social Evolution of Bacterial language diversity

Abstract:

Bacteria use simple cell-cell communication systems to monitor their density in the environment and control collective behaviors. This simple quorum sensing mechanism works by the secretion of a small diffusible molecule and its identification by a specific receptor. Many bacterial species show divergence in their quorum-sensing "languages", where a signal produced by one strain activates its cognate receptor, but not the receptor of another strain. In addition, bacteria often accumulate multiple quorum-sensing systems that control the same response. In this lecture, I will combine simple modeling and experiments to introduce the concept of quorum-sensing, demonstrate its altruistic ('free-riding') characteristics and explain how social evolution explain its maintenance and how can different quorum-sensing languages evolve, co-exist and accumulate.