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# A genotypic view of social interactions in multispecies microbial communities

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## Abstract

Session: Social microbes (Mitri, Dupré, Clarke, Birch)

Microbes live in dense communities composed of different strains and species, whose members can have positive or negative fitness effects on other cells. Disentangling social interactions between strains and species is central to understanding microbial communities and how they respond to perturbations. In particular, we are interested in how ecological factors, such as the spatiogenetic organization of a community or the availability of resources affect selection for cooperative or competitive interactions, and how selection shapes communities accordingly. Based on ecological and evolutionary theory, we propose a general null model which we call the genotypic view. This states that cooperation will occur when cells are surrounded by identical genotypes at the loci that drive interactions, where identity comes from recent clonal growth or horizontal gene transfer. Different genotypes will typically compete. We show how empirical data from the literature offers support for this view with relatively few examples of cooperation between genotypes.

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