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Games of multicellularity

Evolutionary game dynamics are often studied in the context of different population structures. Here we propose a new population structure that is inspired by simple multicellular life forms. We study deterministic evolutionary dynamics with mutations, and derive exact conditions for selection to favor one strategy over another. Our main result has the same symmetry as the well-known sigma condition, which has been proven for stochastic game dynamics and weak selection. We discuss evolutionary stability condition (ESS) in Prisoner's Dilemma and Hawk-Dove games as examples of this model.