

Abstract Submitted
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Competition between species can drive public goods cooperation within a species HASAN CELIKER, EECS department, MIT, JEFF GORE, Physics department, MIT — Costly cooperative strategies are vulnerable to exploitation by cheats. Microbial studies have suggested that cooperation can be maintained in nature by mechanisms such as reciprocity, spatial structure and multi-level selection. So far, however, almost all laboratory experiments aimed at understanding cooperation have relied on studying a single species in isolation. In contrast, species in the wild live within complex communities where they interact with other species. Little effort has focused on understanding the effect of interspecies competition on the evolution of cooperation within a species. We test this relationship by using sucrose metabolism of budding yeast as a model cooperative system. We find that when co-cultured with a bacterial competitor, yeast populations become more cooperative compared to isolated populations. We show that this increase in cooperation within yeast is mainly driven by resource competition imposed by the bacterial competitor. A similar increase in cooperation is observed in a pure yeast culture when essential nutrients in the media are limited experimentally.

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