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# The dark side of conjugative plasmids

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Conjugative plasmids are extrachromosomal mobile genetic elements pervasive among bacteria. Plasmids' acquisition often lowers cells' growth rate, so their ubiquity has been a matter of debate. Chromosomes occasionally mutate, rendering plasmids cost-free. However, these compensatory mutations typically take hundreds of generations to appear after plasmid arrival. By then, it could be too late to compete with fast-growing plasmid-free cells successfully. Moreover, arriving plasmids would have to wait again hundreds of generations for compensatory mutations to appear in the chromosome of their new host. We hypothesize that plasmid-donor cells may use the plasmid to compete with plasmid-free cells. In structured environments, cells already adapted to plasmids may increase their inclusive fitness through plasmid transfer to impose a cost to nearby plasmid-free cells and increase the replication opportunities of nearby relatives. A mathematical model suggests conditions under which the proposed hypothesis works, and computer simulations tested the long-term plasmid maintenance. Our hypothesis explains the maintenance of conjugative plasmids not coding for beneficial genes and suggests a selective force for the maintenance of non-conjugative plasmids – as a means to avoid incoming conjugative plasmids.

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**14h30-15h30**

