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Bacterial Spite: When Kamikaze-Like Behavior Is a Good Strategy

ScienceDaily (July 28, 2011) — Spite evolves in close quarters, according to research led by Fredrik Inglis of the University of Oxford and ETH, Zurich. Inglis and his team studied a bacterial species in which individuals sometimes explode, releasing a toxin into the environment that is deadly to competing bacteria.

See Also: This kamikaze-like behavior is a bit of an evolutionary mystery. How could a behavior in which an individual gives up its chance to reproduce evolve?

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Ingelis and his team had previously developed a mathematical model showing that such spite is quite likely to evolve in bacterial colonies that are clonal, meaning individuals share the same genes. The model shows that if a few individuals sacrifice themselves to take out competitors, they increase the chances that their genes (albeit in other individuals) will be passed to the next generation. Lab experiments performed by Ingelis and his team support the model.

The experiments further show that spiteful species are most successful

when competing with other species for the same resource patch. Spite is far less successful when multiple patches are available. The results, Ingelis says, could provide insight into how and when bacteria cause disease.

The research appears in the *American Naturalist*.

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1. R. Fredrik Inglis, Patrick Garfield Roberts, Andy Gardner, Angus Buckling. **Spite and the Scale of Competition in *Pseudomonas aeruginosa***. *The American Naturalist*, 2011; 178 (2): 276 DOI: [10.1086/660827](https://doi.org/10.1086/660827)

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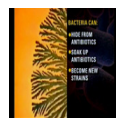
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