

A winning strategy for multicellular life

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Environmental triggers may have tipped the transition from single- to multi-cellular life, according to new research by SFI REU Emma Wolinsky and Omidyar Fellow Eric Libby.

The current research, published in *Evolutionary Ecology*, simulates three [evolutionary strategies](#) that could have coordinated growth and reproduction across multiple cells of *Pseudomonas fluorescens* bacteria in a changing environment. The best strategy for multicellularity proved to be an epigenetic, external sensing scheme wherein a cell's DNA switches its phenotypic expression in response to cues from the external environment. This external sensing strategy outperformed both an internal sensing strategy based on cell history and a stochastic strategy where gene expression switches randomly.

In the case of *Pseudomonas fluorescens*, bacteria have been experimentally observed to switch between single- and multi-celled forms, creating chemical and physical alterations in their [environment](#) as they do so. "While the experimental system we consider is a limited case," the researchers write, "our framework is plastic enough to analyze other types of interactions."

More information: Emma Wolinsky et al. Evolution of regulated phenotypic expression during a transition to multicellularity, *Evolutionary Ecology* (2015). [DOI: 10.1007/s10682-015-9814-3](https://doi.org/10.1007/s10682-015-9814-3)

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