

Antagonistic bacteria disrupt calcium homeostasis and immobilize algal cells.

Aiyar P, Schaeme D, García-Altare M, Carrasco Flores D, Dathe H, Hertweck C, Sasso S, Mittag M (2017) Antagonistic bacteria disrupt calcium homeostasis and immobilize algal cells. *Nat Commun* 8(1), 1756. [PubMed](#)

ILRS Authors

[Prasad Aiyar](#)

Projects

Molecular dissection of early signaling response in the green alga *Chlamydomonas reinhardtii* under the influence of biotic and abiotic factors

[Details](#)

Abstract

Photosynthetic unicellular organisms, known as microalgae, are key contributors to carbon fixation on Earth. Their biotic interactions with other microbes shape aquatic microbial communities and influence the global photosynthetic capacity. So far, limited information is available on molecular factors that govern these interactions. We show that the bacterium *Pseudomonas protegens* strongly inhibits the growth and alters the morphology of the biflagellated green alga *Chlamydomonas reinhardtii*. This antagonistic effect is decreased in a bacterial mutant lacking orfamides, demonstrating that these secreted cyclic lipopeptides play an important role in the algal-bacterial interaction. Using an aequorin Ca²⁺-reporter assay, we show that orfamide A triggers an increase in cytosolic Ca²⁺ in *C. reinhardtii* and causes deflagellation of algal cells. These effects of orfamide A, which are specific to the algal class of Chlorophyceae and appear to target a Ca²⁺ channel in the plasma membrane, represent a novel biological activity for cyclic lipopeptides.

Identifier

doi: 10.1038/s41467-017-01547-8 PMID: 29170415