Antagonistic bacteria disrupt calcium homeostasis and immobilize algal cells.

Aiyar P, Schaeme D, García-Altares 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.

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 Ca(2+)-reporter assay, we show that orfamide A triggers an increase in cytosolic Ca(2+) 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 Ca(2+) channel in the plasma membrane, represent a novel biological activity for cyclic lipopeptides.

Beteiligte Forschungseinheiten

Biomolekulare Chemie Christian Hertweck Mehr erfahren

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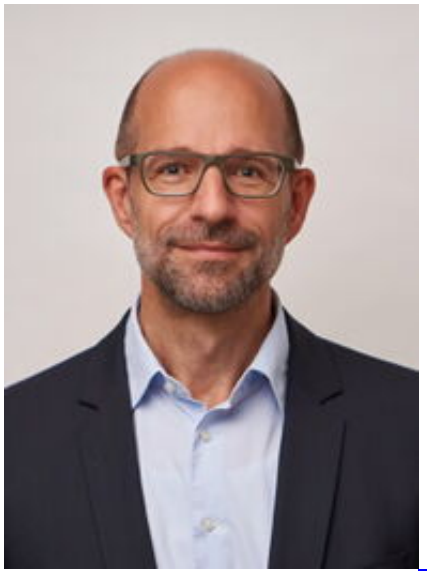
Details



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