Targeted induction of a silent fungal gene cluster encoding the bacteria-specific germination inhibitor fumigermin.

Stroe MC, Netzker T, Scherlach K, Krüger T, Hertweck C, Valiante V, Brakhage AA (2020) Targeted induction of a silent fungal gene cluster encoding the bacteria-specific germination inhibitor fumigermin. *eLife* 9, e52541.

Details

PubMed
OPEN ACCESS
PAPER

Abstract

Microorganisms produce numerous secondary metabolites (SMs) with various biological activities. Many of their encoding gene clusters are silent under standard laboratory conditions because for their activation they need the ecological context, such as the presence of other microorganisms. The true ecological function of most SMs remains obscure, but understanding of both the activation of silent gene clusters and the ecological function of the produced compounds is of importance to reveal functional interactions in microbiomes. Here, we report the identification of an as-yet uncharacterized silent gene cluster of the fungus *Aspergillus fumigatus*, which is activated by the bacterium *Streptomyces rapamycinicus* during the bacterial-fungal interaction. The resulting natural product is the novel fungal metabolite fumigermin, the biosynthesis of which

requires the polyketide synthase FgnA. Fumigermin inhibits germination of spores of the inducing S. rapamycinicus, and thus helps the fungus to defend resources in the shared habitat against a bacterial competitor.

Beteiligte Forschungseinheiten

Biomolekulare Chemie Christian Hertweck Mehr erfahren

Molekulare und Angewandte Mikrobiologie Axel Brakhage Mehr erfahren

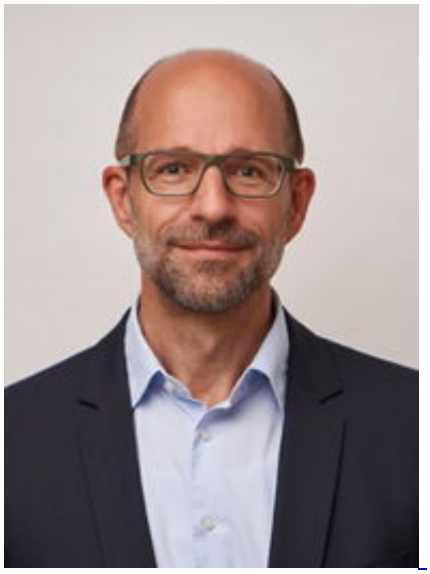
Biobricks mikrobieller Naturstoffsynthesen Vito Valiante Mehr erfahren

Leibniz-HKI-Autor*innen



Axel A. Brakhage

Details



Christian Hertweck

Details



Thomas Krüger

Details



Tina Netzker

Details



Kirstin Scherlach

Details



Maria Stroe

Details



Vito Valiante

Details

Identifier

doi: 10.7554/eLife.52541

PMID: 32083553