

Functional Reconstitution of a Fungal Natural Product Gene Cluster by Advanced Genome Editing.

Weber J, Valiante V, Nødvig CS, Mattern DJ, Slotkowski RA, Mortensen UH, Brakhage AA (2017) Functional Reconstitution of a Fungal Natural Product Gene Cluster by Advanced Genome Editing. *ACS Synth Biol* 6(1), 62-68.

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Abstract

Filamentous fungi produce varieties of natural products even in a strain dependent manner. However, the genetic basis of chemical speciation between strains is still widely unknown. One example is tryptacidin, a natural product of the opportunistic human pathogen *Aspergillus fumigatus*, which is not produced among different isolates. Combining computational analysis with targeted gene editing, we could link a single nucleotide insertion in the polyketide synthase of the tryptacidin biosynthetic pathway and reconstitute its production in a nonproducing strain. Thus, we present a CRISPR/Cas9-based tool for advanced molecular genetic studies in filamentous fungi, exploiting selectable markers separated from the edited locus.

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Leibniz-HKI-Autor*innen



Axel A. Brakhage

[Details](#)



Derek J. Mattern

[Details](#)



Vito Valiante

[Details](#)



Jakob Weber

[Details](#)

Identifier

doi: 0.1021/acssynbio.6b00203

PMID: 27611015