

Leader peptide and a membrane protein scaffold guide the biosynthesis of the tricyclic peptide microviridin.

Weiz AR, Ishida K, Makower K, Ziemert N, Hertweck C, Dittmann E (2011) Leader peptide and a membrane protein scaffold guide the biosynthesis of the tricyclic peptide microviridin. *Chem Biol* 18(11), 1413-1421.

[Details](#)



Abstract

Microviridins are unique protease inhibitors from bloom-forming cyanobacteria that have both ecological and pharmacological relevance. Their peptide backbones are produced ribosomally, and ATP grasp ligases introduce ω -ester and ω -amide bonds to yield rare cage-like structures. Bioinformatic analysis of the microviridin biosynthesis gene cluster suggests a novel type of processing machinery, which could rationalize the challenging *in vivo/in vitro* reconstitution of the pathway. In this work, we report the establishment of a minimal expression system for microviridins. Through bioinformatics and mutational analysis of the MdnA leader peptide we identified and characterized a strictly conserved binding motif that is specific for microviridin ligases. Furthermore, we showed that the ABC transporter MdnE is crucial for cyclization and processing of microviridins and demonstrated that MdnE is essential for stability of the microviridin biosynthesis complex.

Beteiligte Forschungseinheiten

[Biomolekulare Chemie Christian Hertweck](#) [Mehr erfahren](#)

Leibniz-HKI-Autor*innen



Christian Hertweck

[Details](#)

Identifier

doi: 10.1016/j.chembiol.2011.09.011

PMID: 22118675