



## **Katharina Dornblut (née Graupner)**

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### **Molecular basis of bacterial-mushroom interactions**

Natural products are an important drug source with properties ranging from antibacterial and antifungal to antiproliferative and immunosuppressive. Intriguingly, a significant number of secondary metabolites are produced during microbial interactions. Therefore, this field of natural product research is very promising in order to gain new drugs or drug leads to fight emerging resistance of human pathogens.

During my PhD project I am investigating a variety of bacterial-fungal interactions between cultivated mushrooms and diverse bacteria like *Janthinobacterium agaricidamnorum*. *J. agaricidamnorum* and other fungal pathogenic bacteria cause diseases, such as soft rot disease or brown blotch disease. The aim of this project is to understand the molecular basis of the bacterial infection process and to identify and characterize natural products that are involved in these interactions. Thereby, we hypothesize that the isolated natural products might also be active against human pathogens and hence might serve as a starting point for the development of novel antifungal therapy. The bacteria's capacity to produce secondary metabolites are analyzed via genome mining. Additionally, the bacterial-fungal interactions are studied with various elaborated analytical techniques like imaging mass spectrometry. Structural elucidation of the virulence factors is carried out with the help of NMR, MS/MS and chemical derivatization experiments.

## Publications

Fischer D, Gessner G, Fill TP, Barnett R, Tron K, Dornblut K, Kloss F, Stallforth P, Hube B, Heinemann SH, Hertweck C, Scherlach K, Brunke S (2019) Disruption of membrane integrity by the bacteria-derived antifungal jagaricin. *Antimicrob Agents Chemother* 63(9), pii: e00707-19. [Details PubMed](#)

Ding L, Goerls H, Dornblut K, Lin W, Maier A, Fiebig HH, Hertweck C (2015) Bacaryolanes A-C, Rare Bacterial Caryolanes from a Mangrove Endophyte. *J Nat Prod* , [Details PubMed](#)

Graupner K, Lackner G, Hertweck C (2015) Genome Sequence of Mushroom Soft-Rot Pathogen *Janthinobacterium agaricidamnorum*. *Genome Announc* 3(2), [Details PubMed](#)

Haq IU, Graupner K, Nazir R, van Elsas JD (2014) The genome of the fungal-interactive soil bacterium *Burkholderia terrae* BS001-a plethora of outstanding interactive capabilities unveiled. *Genome Biol Evol* 6(7), 1652-1668. [Details PubMed](#)

Scherlach K, Graupner K, Hertweck C (2013) Molecular bacteria-fungi interactions: effects on environment, food, and medicine. *Annu Rev Microbiol* 67, 375-397. [Details PubMed](#)

Scherlach K, Lackner G, Graupner K, Pidot S, Bretschneider T, Hertweck C (2013) Biosynthesis and mass spectrometric imaging of tolaasin, the virulence factor of brown blotch mushroom disease. *Chembiochem* 14(18), 2439-2443. [Details PubMed](#)

Graupner K, Scherlach K, Bretschneider T, Lackner G, Roth M, Gross H, Hertweck C (2012) Imaging mass spectrometry and genome mining reveal highly antifungal virulence factor of mushroom soft rot pathogen. *Angew Chem Int Ed Engl* 51(52), 13173-13177. [Details PubMed](#)

## Supervisor

[Christian Hertweck](#)

## Start of PhD

September 12, 2011

## Doctoral Disputation

February 14, 2017