

Prof. Dr. Elke Dittmann

Research Statement

I am intrigued by chemical mediators and their role in structuring microbial communities and host-microbe interactions. My focus is the investigation biosynthetic pathways of specialized compounds in cyanobacteria as well as their evolutionary diversification, biotechnological exploitation and spatial and temporal distribution in microbial communities. I am particularly interested in bloom-forming freshwater cyanobacteria and terrestrial symbiotic cyanobacteria.

Academic Track Record

Since 2009	Professor of Microbiology at U Potsdam
2003-2009	Junior Professor of Molecular Ecology, HU Berlin
2002-2003	Scientific Assistant, Institute for Freshwater Ecology and Inland Fisheries Berlin
2000-2001	Humboldt Research Associate with Prof. B. Neilan, UNSW Sydney, Australia
1997-2000	Postdoctoral Researcher, HU Berlin
1994-1997	PhD Student, HU Berlin

Selected Commissions of Trust

2020-2022	Managing Director at Institute of Biochemistry and Biology, U Potsdam
2016-2020	Editorial board member of "Cell Chemical Biology"
2015-2017	Editorial board member of "Environmental Microbiology"
2022-	Member of the advisory board of the Cluster of Excellence "Controlling Microbes to Fight Infections" Tübingen
2015-	Member of advisory board of DECHEMA section: "Niedermolekulare Naturstoffe mit biologischer Aktivität"
2012-2018	Member of the advisory board of the Leibniz Institute for Natural Product Research and Infection Biology, Jena
2010-2021	Speaker of the VAAM section "Biology of bacteria producing natural products"

Publication Profile

125+ publications in international peer-reviewed journals, including Proceedings of the National Academy of Science USA, Nature Chemical Biology, Angewandte Chemie International Edition, Molecular Biology and Evolution, Current Biology ...

Web of Science: h-index 53, >9.000 citations, 25 papers with >100 citations.

Google Scholar: h-index 59, >14.000 citations; 43 papers with >100 citations.

Awards

- 2009 Junior Scientist Award for Natural Product Research of DECHEMA
2000 Feodor Lynen grant of the Alexander-von-Humboldt Foundation

Publications (selected)

Krumbholz, J., Ishida, K., Baunach, M., Teikari, J.E., Rose, M.M., Sasso, S., Hertweck, C., **Dittmann, E.** (2022). Deciphering Chemical Mediators Regulating Specialized Metabolism in a Symbiotic Cyanobacterium. *Angew. Chem. Int. Ed.* 61: e202204545, doi: 10.1002/anie.202204545.

Baunach, M., Chowdhury, S., Stallforth, P., **Dittmann, E.** (2021). The landscape of recombination events that create nonribosomal peptide diversity. *Mol. Biol. Evol.* 38:2116-2130.

Dehm, D., Krumbholz, J., Baunach, M., Wiebach, V., Hinrichs, K., Guljamow, A., Tabuchi, R., Jenke-Kodama, H., Süßmuth, R.D., **Dittmann, E.** (2019). Unlocking the spatial control of secondary metabolism uncovers hidden natural product diversity in *Nostoc punctiforme*. *ACS Chem Biol.* 14:1271-1279.

Panrace, C., Ishida, K., Briand, E., Gatte-Picchi, D., Weiz, A.R., Guljamow, A., Scalvenzi, T., Sassoon, N., Hertweck, C., **Dittmann, E.***, Gugger, M.* (2019). A unique biosynthetic pathway in bloom-forming cyanobacterial genus *Microcystis* jointly assembles cytotoxic aeruginoguanidines and microguanidines. *ACS Chem. Biol.* 14:67-75.

Meyer, S., Mainz, A., Kehr, J.C., Süßmuth, R.D., **Dittmann, E.** (2017). Prerequisites of isopeptide bond formation in microcystin biosynthesis. *ChemBioChem* 18:2376-2379.

Reyna-González, E., Schmid, B., Petras, D., Süßmuth, R.D., **Dittmann, E.** (2016). Leader peptide-free in vitro reconstitution of microviridin biosynthesis enables design of synthetic protease-targeted libraries. *Angew. Chem. Int. Ed.* 55:9398-9401.

Meyer, S., Kehr, J.C., Mainz, A., Dehm, D., Petras, D., Süßmuth, R.D., **Dittmann, E.** (2016) Biochemical dissection of the natural diversification of microcystin provides lessons for synthetic biology of NRPS. *Cell Chem. Biol.* 23:462-471

Liaimer, A., Helfrich, E.J.N., Hinrichs, K., Guljamow, A., Ishida, K., Hertweck, C., **Dittmann, E.** (2015). Nostopeptolide plays a governing role during cellular differentiation of the symbiotic cyanobacterium *Nostoc punctiforme*. *Proc. Natl. Acad. Sci. U.S.A.* 112:1862-1867.

Hu, C., Völler, G., Süßmuth, R., **Dittmann, E.**, Kehr, J.C. (2014) Functional assessment of mycosporine-like amino acids in *Microcystis aeruginosa* strain PCC7806. *Environ. Microbiol.* 17:1548-1559.

Weiz, A., Ishida, K., Qwitterer, F., Meyer, S., Müller, K., Groll, M., Hertweck, C., **Dittmann, E.** (2014). Harnessing the evolvability of tricyclic microviridins to dissect protease-inhibitor interactions. *Angew. Chem. Int. Ed.* 53:3735-3738.