Biosketch

Univ.-Prof. Dr. Thomas Böttcher

Position in CoE: Key Researcher

Personal Details

Place of birth	Munich, Germany
Nationality	German
Children	1 (2016)
Affiliation:	University of Vienna
E-Mail	thomas.boettcher@univie.ac.at
Profile	ResearcherID: O-7630-2019
List of publications	ORCID: 0000-0003-0235-4825
Academic age	12 years since PhD

Academic Career and Positions Held

In 2006, I was admitted to the **fast track PhD program** of the **Ludwig Maximilian University** (LMU) of Munich, Germany (with distinction, grade 1.0) and earned my PhD with *summa cum laude* in 2009 from the laboratory of Stephan A. Sieber at the Department Chemistry and Biochemistry and CIPSM of the LMU. Following a short postdoctoral stint at the Technical University (TU) of Munich, Germany, I co-founded the **start-up company AVIRU GmbH**. Here, as project leader, I directed the development of a clinical candidate for the treatment of multiresistant bacteria by the inhibition of virulence. Subsequently, I joined in 2011 the laboratory of John Clardy at **Harvard Medical School** in Boston, USA as postdoctoral researcher, supported by a research fellowship of Leopoldina, German National Academy of Sciences. In 2014, I started my independent research group at the University of Konstanz, Germany, with support by the **Emmy Noether Program** of the German Research Foundation (DFG). Since October 2020, I am **full professor for "Microbial Biochemistry",** bridging the Faculty of Chemistry and the Centre for Microbiology and Environmental Systems Science (CeMESS) by a dual affiliation to both units. I am also member of the board of experts of the Austrian Microbiome Initiative (AMICI), the collegium of the Heidelberg Academy of Sciences and Humanities, and the Senate Competition Committee of the Leibniz Association.

Scientific Achievements and Scientific Contribution to the CoE

Scientific Achievements. I published over 50 peer-reviewed papers (most in Q1 journals, h-index 21), 4 books or book chapters, and 8 patent applications. I have raised more than 10 third party funded projects from German and EU funding agencies (in total >5.5 million €), including an Emmy Noether Grant of DFG (1.9 million €), and an **ERC Consolidator Grant** (2.0 million €). I also was involved as Co-PI in a Collaborative Research Centre (SFB969) of DFG. In my research group, we use chemical biology to **develop chemical tools** such as t**argeted inhibitors of virulence associated enzymes and species-selective antibiotics**. In addition, we are investigating the **chemical interactions of commensal and pathogenic bacteria** as well as the chemistry of microbe-human interactions and aim to exploit the potential of the privileged structures of natural products by synthetic organic chemistry. We have extensive experience with detection of microbial 2-alkyl-4(1H)-quinolones used in quorum sensing and defense, elucidation of siderophore structure and biosynthesis, as well as development of customized enzyme inhibitors (e.g., of quorum sensing pathways). We have also conducted pioneering research the field of **prophage induction by bacterial metabolites**. My research achievements were recognized, e.g., by the Transfer Award of the University of Konstanz Society 2020 and the Manfred-Fuchs-Preis 2019 of the Heidelberg Academy of Sciences and Humanities.

Scientific contribution to the CoE. I will contribute to the CoE with my expertise in the isolation and structure elucidation of microbial natural products such as quorum sensing signals and antibiotics by a combination of 1D and 2D NMR spectroscopy and mass spectrometry. Furthermore, we will apply our chemical tools for the discovery and development of customized enzyme inhibitors for selected microbial metabolites and pathways using our ligand selection platform.

10 Most Important Publications (*relevant for the CoE)

1. *Jancheva, M.; **Böttcher, T.** A Metabolite of *Pseudomonas* Triggers Prophage-Selective Lysogenic to Lytic Conversion in *Staphylococcus Aureus*. *J. Am. Chem. Soc.* **2021**, *143* (22), 8344–8351. *https://doi.org/10.1021/jacs.1c01275*.
2. *Prothiwa, M.; Filz, V.; Oehler, S.; **Böttcher, T.** Inhibiting Quinolone Biosynthesis of *Burkholderia*. *Chem. Sci.* **2021**, *12* (20), 6908–6912. *https://doi.org/10.1039/D0SC06167K*.
3. Peñalver, L.; Schmid, P.; Szamosvári, D.; Schildknecht, S.; Globisch, C.; Sawade, K.; Peter, C.; **Böttcher, T.** A Ligand Selection Strategy Identifies Chemical Probes Targeting the Proteases of SARS-CoV-2. *Angew. Chem. Int. Ed.* **2021**, *60* (12), 6799–6806. *https://doi.org/10.1002/anie.202016113*.
4. *Szamosvári, D.; Prothiwa, M.; Dieterich, C. L.; **Böttcher, T.** Profiling Structural Diversity and Activity of 2-Alkyl-4(1 H)-Quinolone N -Oxides of *Pseudomonas and Burkholderia*. *Chem. Commun.* **2020**, *56* (47), 6328–6331. *https://doi.org/10.1039/D0CC02498H*.
5. *Pawar, A.; Basler, M.; Goebel, H.; Alvarez Salinas, G. O.; Groettrup, M.; **Böttcher, T.** Competitive Metabolite Profiling of Natural Products Reveals Subunit Specific Inhibitors of the 20S Proteasome. *ACS Cent. Sci.* **2020**, *6* (2), 241–246. *https://doi.org/10.1021/acscentsci.9b01170*.
6. *Szamosvári, D.; **Böttcher, T.** An Unsaturated Quinolone N -Oxide *of Pseudomonas Aeruginosa* Modulates Growth and Virulence of *Staphylococcus Aureus*. *Angew. Chem. Int. Ed.* **2017**, *56* (25), 7271–7275. *https://doi.org/10.1002/anie.201702944*.
7. Rütschlin, S.; Gunesch, S.; **Böttcher, T.** One Enzyme, Three Metabolites: Shewanella Algae Controls Siderophore Production via the Cellular Substrate Pool. *Cell Chemical Biology* **2017**, *24* (5), 598–604.e10. *https://doi.org/10.1016/j.chembiol.2017.03.017*.
8. *Prothiwa, M.; Englmaier, F.; **Böttcher, T.** Competitive Live-Cell Profiling Strategy for Discovering Inhibitors of the Quinolone Biosynthesis of *Pseudomonas Aeruginosa*. *J. Am. Chem. Soc.* **2018**, *140* (43), 14019–14023. *https://doi.org/10.1021/jacs.8b07629*.
9. *Szamosvári, D.; Schuhmacher, T.; Hauck, C. R.; **Böttcher, T.** A Thiochromenone Antibiotic Derived from the *Pseudomonas* Quinolone Signal Selectively Targets the Gram-Negative Pathogen *Moraxella Catarrhalis*. *Chem. Sci.* **2019**, *10* (27), 6624–6628. *https://doi.org/10.1039/C9SC01090D*.
10. ***Böttcher, T.**; Clardy, J. A Chimeric Siderophore Halts Swarming *Vibrio*. *Angew. Chem. Int. Ed.* **2014**, *53* (13), 3510–3513. *https://doi.org/10.1002/anie.201310729*.