

DEPARTMENT OF BIOCHEMISTRY FACULTY RECRUITMENT CANDIDATE SEMINARS:
Assistant Professor in Metabolomics of Adaptive Responses



Daniel Petras, Junior Research Group Leader, University of Tuebingen

Research Seminar:
Tuesday, January 31, 2023 | 12:00 p.m. – 1:00 p.m.

Seminar Title: "From Molecules to Ecosystems – A Functional Metabolomics Toolbox to Study the Role and Fate of Small Molecules within Microbial Communities"

Abstract: The chemical diversity of the metabolome represents a fascinating source of bioactive compounds that are fundamentally important for organismal and ecosystem function. Thanks to recent advances in mass spectrometry, bioinformatics, and the massive efforts of the scientific community during the last century, we can identify a wide range of metabolites and their activities in complex environments.

While such metabolite inventories can provide us detailed insights into molecular mechanisms in a given system, the number of known metabolites and activities represents only a small fraction of all metabolites. To fully map out and leverage the chemical and bioactivity space of nature, new methods are needed, as traditional isolation and bioactivity studies do not scale to contemporary non-targeted metabolomics workflows. To address this need, we develop new workflows that integrate mass spectrometry-based metabolomics with online bioactivity profiling and native mass spectrometry, which preserves non-covalent binding, such as metal or protein-metabolite interactions.

In this presentation, I will showcase some of our recent ecosystem level metabolomics studies and discuss the potential and further development of our functional metabolomics toolbox for the screening of bioactivity, molecular interactions, and putative biotransformation products, which we hope will contribute to the systematic mapping of the functional roles and fate of small molecules in biology.

Biography: Daniel Petras is biochemist with a background in bioanalytical and natural product chemistry. He received his master's degree in biotechnology from the University of Applied Science Darmstadt and his PhD in biochemistry from the Technical University Berlin in 2016. His thesis in the group of Roderich Suessmuth focused on the discovery, structure elucidation and biosynthesis of different peptide toxins, including albicidins, a group of potent antibiotics. For his postdoctoral research, Daniel joined the lab of Pieter Dorrestein at the University of California San Diego, where he focused on the development of large-scale environmental metabolomics methods. In 2021, Daniel launched the Functional Metabolomics Lab at the University of Tuebingen as an independent Junior Research Group. The work of his group focuses on the development and application of mass spectrometry-based methods to visualize and functionally assess chemical exchange within microbial communities.

ZOOM Link for Seminar: <https://ucr.zoom.us/j/96609235332>
Meeting ID: 966 0923 5332

Host: Dr. Jikui Song