



University of Stuttgart

Stuttgart Research Center Systems Biology



Systems Biology Seminar Talk

Microfluidic single-cell cultivation: More than just analysis of single cells?!

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Lecture Hall 0.106
Allmandring 31
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Abstract:

Our understanding of microbial organisms is still dominated by an average cell approach in which all cells are seen to behave equally. The complex interplay between environmental dynamics and the subsequent cellular response is still a mystery. Therefore, novel analytical methods need to be developed to understand these phenomena in detail.

In this presentation I will give an introduction into microfluidic single-cell cultivation (MSCC) and its application in biotechnology and bioprocess engineering. MSCC offers precisely controlled external environmental conditions and allows in combination with live-cell imaging single-cell analysis at full spatio-temporal resolution. I will demonstrate the versatility of this technology and how it can be used to get a deeper understanding of microbial physiology on the example of *Corynebacterium glutamicum*. Latest developments, results as well as technological challenges will be discussed.

CV:

Dr. -Ing. Alexander Grünberger is Professor for Bioprocess Engineering in the Department of Chemical and Process Engineering at the Karlsruhe Institute of Technology (KIT). He received his PhD in Bioprocess Engineering from RWTH Aachen University in 2015, his research field being microfluidics and single-cell analysis. After joining Bielefeld University in 2017 as Assistant Professor, he joined KIT as full Professor in 2022. His present research focuses on the establishment and application of microfluidic systems for bioprocess development. He has received several awards for research and teaching, including the B&B Daniel I.C. Wang Award 2023.