



University of Stuttgart

Stuttgart Research Center Systems Biology (SRC SB)

Systems Biology Seminar Talk

„Metabolic Biomarker Discovery in the Context of Renal Diseases“

Prof. Dr. Helena Zacharias
Hannover Medical School



Wednesday
June 29, 2022
10 a.m. – 11 a.m.

Online over Webex:

<https://unistuttgart.webex.com/unistuttgart/j.php?MTID=m5f307b7e91f2a397e2ba15083ffb706f>

Abstract:

The global burden of human renal diseases continually increased in the last decades. To lower associated mortality and morbidity rates, early diagnosis and prognosis as well as improved understanding of underlying biological mechanisms are essential. Here, we present both metabolic investigations of biofluids by means of nuclear magnetic resonance (NMR) spectroscopy in the context of nephrology and new machine learning approaches for complex biomedical data analysis. In the context of acute kidney injury, we detected novel urine and blood plasma low-molecular-weight factors for improved early diagnosis and patient treatment in a prospective study of adult patients undergoing cardiac surgery. Within the German Chronic Kidney Disease (GCKD) study comprising approx. 5000 chronic kidney disease patients, we identified several multivariate signatures to predict the risk of end-stage renal disease either combining both metabolic and clinical chemistry parameters or solely comprising routine lab parameters, which outperformed state-of-the-art kidney failure risk equations. Finally, we present novel statistical analysis methods for complex biomedical data to reduce erroneous data interpretation and to facilitate efficient data integration across multiple data layers.

CV:

Prof. Dr. rer. nat. Helena U. Zacharias is a professor for “Clinical Data Science” at the Peter L. Reichertz Institute for Medical Informatics (PLRI), Hanover Medical School. From April 2021 to June 2022, she was a professor for “Clinical Metabolomics” at the Department of Internal Medicine I/Institute of Clinical Molecular Biology, Kiel University and University Medical Center Schleswig-Holstein. She obtained her B.Sc. and M.Sc. in physics at the University of Regensburg, and acquired her Ph.D. in biology at the Institute of Functional Genomics, University of Regensburg. She conducted her postdoctoral studies at the Ohio State University and the Helmholtz Center Munich, and headed the junior research group “Computational biomarker discovery” at the University Medicine Greifswald from 2019-2021. Helena’s research focusses on the improved prediction of adverse patient events and the investigation of metabolic pathomechanisms underlying complex diseases.