

Einladung zum Physiologischen Seminar

Dr. Daniel Härtter

Institute of Pharmacology and Toxicology
University Medical Center Göttingen
Campus Institute Data Science (CIDAS)

<https://pharmacology.umg.eu/staff/>



AI-Driven Precision Phenomics of Sarcomere Structure and Dynamics in hiPSC-Derived Cardiomyocytes

Abstract: Cardiac contractility emerges from a precise structural hierarchy: from molecular motors to contractile sarcomeres, which form extensive myofibril networks that drive cell contraction and ultimately enable synchronized tissue function. To understand cardiac function in health and disease, we must analyze this entire chain, but tools for such integrated, multi-scale analysis are lacking. To bridge this gap, we developed SarcAsM (Sarcomere Analysis Multitool), an open-source deep-learning software designed for multi-scale phenotyping of cardiomyocyte architecture and dynamics. SarcAsM enables a comprehensive, multi-level assessment of sarcomere structure and nanometer-precision motion tracking. Its versatile, pre-trained model ensures immediate applicability across diverse experimental datasets. We demonstrate its utility by: (i) revealing complex, heterogeneous sarcomere behaviors that underlie cardiomyocyte contraction cycles, and (ii) tracking the evolution of drug-induced changes to sarcomere structure over a 10-day period. By providing a robust platform for quantitative analysis, SarcAsM enhances our ability to phenotype sarcomere function and architecture in both healthy and diseased states. This facilitates a deeper understanding of cardiac disease mechanisms and accelerates the evaluation of therapeutic interventions.

Datum: 2. Dezember 2025

Ort: Hörsaal M

Gebäude: I01-H0-1140

Zeit: 16:30 Uhr

Gäste sind herzlich willkommen!

Ansprechpartner:

Dr. Sarah Konze, Institut für Molekular und Zellphysiologie, Tel: 2754

<https://www.mhh.de/molzellphys/sarah-konze-1>