SFB 1286 Quantitative Synaptology

UNIVERSITÄTSMEDIZIN GÖTTINGEN : UMG

"Novel computational and molecular tools for studying organelle dynamics"

Speaker

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Time

Thursday, 15th December 2022
5:00 PM

Location

zoom

https://gwdg.zoom.us/j/85147921523?pwd=RHpu SGFaUXlnMWVZOWFIVjUwTVAxQT09
Meeting ID: 851 4792 1523
Passcode: 696145

Abstract

One of the key features of life is that it is _dynamic_. This is true even for relatively stable biological systems that often appear deceptively static on the surface. But when you study them at the microscopic level you discover mind-bending levels of movement, turnover, and reshaping of subcellular structures, all being driven by dynamic molecular machines. These activities are all precisely organized and must be coordinated in time and space for cells to function properly. For example, improper regulation of mitochondria dynamics leads to many aging-related disorders including cancer and neurodegeneration. To understand how exactly these subcellular dynamics are disrupted in disease, we must be able to monitor and manipulate them with high spatiotemporal precision. Thus, a major focus of my lab is to develop and apply advanced computational and molecular tools for biological research. We use a multidisciplinary approach to determine how cells and tissues dynamically organize and maintain homeostasis over time in health and disease. To do this we develop and utilize genetic and viral tools, deep learning-based computational methods, patient-derived stem cell technology, transgenic animal models, and electrophysiological and behavioral assays. By dissecting the cellular and molecular mechanisms of diseases including neurodegeneration and hearing loss, we aim to identify novel targets and pathways, as well as new phenotyping methods to identify candidate therapies for preclinical and clinical trials.

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