Physikalisches Kolloquium — Physics Colloquium

Einladung — **Invitation**

Monday, 24 October 2022

ROOM CHANGE: Lecture Hall N24/H13, at 16:15 hrs

Coffee and cookies will be served in front of the lecture hall from 16:00 hrs

Biophysics of retinal organoids

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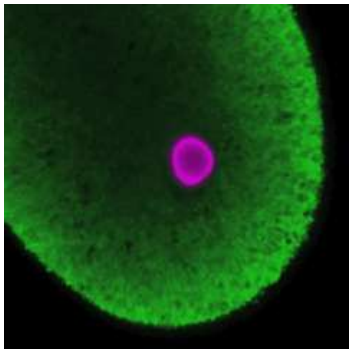
The bottom-up assembly of complex systems often enables researchers to study those at a fundamental level. For the brain or the retina, however, this assembly still is beyond our experimental reach. In recent years, researchers have engineered multi-cellular 3D systems, retinal organoids, which share the same cell types and tissue organization as their *in vivo* counterparts. In the near future, those *in vitro* models provide an opportunity to glimpse at how biology self-assembles neuronal networks and how mechanics guides the formation of their shape, structure and function.
In this seminar, I will present the current and future research of our ERC-funded group. We will explore how tissue mechanics controls retina organoid growth and neuronal function. For this, we build on our expertise in mechanics measurements[1,2] and retina organoid technology[3].
Quantifying the mechanics of neuronal systems might promote a biophysical understanding how neuronal networks are formed and how their function might be tuned via physical cues.



1 Serwane F. et al., In vivo quantification of spatially-varying mechanical properties in developing tissues, Nature Methods, 14, 181-186, 2017
2 Mongera A., et al., A fluid-to-solid jamming transition underlies vertebrate body axis elongation, Nature, 561, 401-405, 2018
3 Zhang H., et al. Together is better: mRNA co-encapsulation in lipoplexes is required to obtain ratiometric co-delivery and protein expression on the single cell level, Adv. Sci. 2102072, 2021
4. Wysmolek et al., bioarxiv A minimal-complexity light-sheet microscope maps network activity in 3D neuronal systems, biorxiv 2022.06.20.496852

Host: Prof. Dr. Jens Michaelis, Institute of Biophysics

Organisation: Prof. Dr. Jens Michaelis, Institute of Biophysics, jens.michaelis@uni-ulm.de, +49-731-50-23050