Mechanobiology in Epithelial 3D Tissue Constructs

ME3T LECTURES

GRK 2415

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In vitro biomimetic electronics

Thursday, February 17, 2022
at 9:15am

Online-Lecture

Zoom-Link:
https://rwth.zoom.us/j/91504326004?pwd=R2dvWEcyQmpCenNNZDRYWHMzVExLUT09
Meeting-ID: 915 0432 6004
Kenncode: 334655

Host: Rudolf Leube
Institute of Molecular and Cellular Anatomy (MOCA)

Contact: me3t@ukaachen.de

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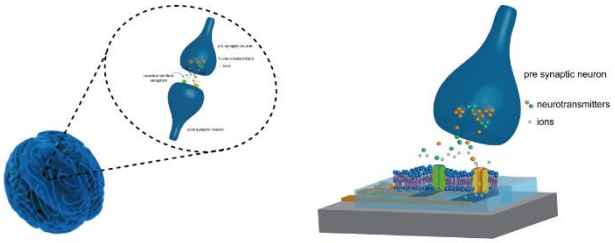

The interface between biological cells and non-biological materials has profound influences on cellular activities, chronic tissue responses, and ultimately the success of medical implants and bioelectronic devices. The optimal coupling between cells, i.e. neurons, and materials is mainly based on surface interaction, electrical communication and sensing.

In the last years, many efforts have been devoted to the engineering of materials to recapitulate both the environment (i.e. dimensionality, curvature, dynamicity) and the functionalities (i.e. long and short term plasticity) of the neuronal tissue to ensure a better integration of the bioelectronic platform and cells.

On the one hand, here we explore how the transition from planar to pseudo-3D nanopatterned inorganic and organic materials have introduced a new strategy of integrating bioelectronic platforms with biological cells under static and dynamic conditions.. On the other hand, we investigate how organic semiconductors can be exploited for recapitulating electrical neuronal functions such as long term and short term potentiation. In this way, both the topology and the material functionalities can be exploited for achieving in vitro biohybrid platforms for neuronal network interfacing.