

Cilium checkpoint and human brain organoids

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Centrosomes and cilia are conserved cellular structures essential for organism development. The primary cilium is a microtubule-based organelle that is dynamically regulated, with assembly occurring during cell cycle exit, and disassembly coinciding with cell cycle re-entry. By studying microcephaly brain organoids, we identified a “cilium checkpoint” that revealed how a timely cilia disassembly is critical to regulate neural stem cell homeostasis during brain development. Intriguingly, the “cilium checkpoint” is inactivated in glioma cancer stem cells. As a result, cancer stem cells undergo uncontrolled self-renewal. Targeting the cilium checkpoint by chemical or genetic manipulation, we could inhibit glioma self-renewal properties and trigger them to differentiate. I shall also highlight how we use brain organoids to model patient-derived glioma cells invasion and new developments in organoids such as generation of brain organoids with functional optic cups.

Wednesday, March 27th, 2019 at 2:15 pm

**MPIDS, Seminar room 0.77,
Am Faßberg 17, Göttingen**

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