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VIRTUAL

iPSZÜRICH

A Lecture Series Focused on Induced Pluripotent Stem Cells



Yoke Chin

Interuniversity Microelectronics Centre - imec,
Leuven, Belgium



CAN MINIMAL SYSTEMS CAPTURE BRAIN COMPLEXITY? LESSONS FROM 3D NEURAL CONCENTROIDS AND NEUROVASCULAR SELF- ORGANIZATION

Human pluripotent stem cell-derived brain organoids have transformed the study of human neurodevelopment but often lack vascular components and exhibit substantial complexity and variability. In this lecture, I will present 3D neural concentroids, a reductionist yet physiologically relevant human model formed through the fusion and self-organization of neural progenitor spheroids. These engineered tissues spontaneously establish spatially organized neuronal and astroglial domains and support the development of neurovascular structures when combined with stem cell-derived endothelial cells.

I will discuss how controlled self-organization can reveal fundamental mechanisms of neurovascular development, blood-brain barrier formation, neural maturation, and cell-cell communication in the developing human brain. By bridging the gap between simple cell cultures and complex organoids, neural concentroids provide a reproducible platform for developmental biology, disease modeling, and next-generation vascularized tissue engineering.



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