Colloquium

Emergence of spontaneous oscillatory networks from human brain organoids

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The complexity of the human brain, with thousands of neuronal types, permits the development of sophisticated behavioral repertoires, such as language, tool use, self-awareness, symbolic thought, cultural learning and consciousness. Understanding what produces neuronal diversification during brain development has been a longstanding challenge for neuroscientists and may bring insights into the evolution of human cognition. Human pluripotent stem cells have the ability to differentiate in specialized cell types, such as neurons and glia. Moreover, induced pluripotent stem cells can be achieved from living individuals by reprogramming somatic cells that would capture their entire genome in a pluripotent state. From these pluripotent state, it is possible to generate models of the human brain, such as brain organoids. We have been using brain-model technology (BMT) to gain insights on several biological processes, such as human neurodevelopment and evolution. We also applied BMT to measure the impact of genetic variants in autism spectrum disorders and for evolutionary studies. The reconstruction of human synchronized network activity in a dish can help to understand how neural network oscillations might contribute to the social brain. Our findings suggest a potential bridge to the gap between the microscale in vitro neural networks electrophysiology and non-invasive electroencephalogram.

Monday, June 18, 2018 04:00pm - 05:00pm
Raiffeisen Lecture Hall, Central Building

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