

Psychiatry and Neuroscience Seminar Series 2024



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(Host D Zala/Z Lenkei)

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Reconstructing rodent and human Neuronal Networks to model Neurodegenerative syndromes

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Room D Levy, 102-108 rue de la santé - 75014 Paris

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Human brain is a complex organ composed of several hundred billions of cells and even more numerous interconnected cellular interactions. There is a high demand for experimental models to study these interactions in various contexts, ranging from cognitive sciences to studies of the cellular and molecular mechanisms of neurodegenerative diseases which lead to progressive destruction of neuronal networks. Advance in micro-technologies applied to neuronal networks is paving the way to the development of "brain on chip" that will provide new opportunities to the study of human neuronal networks function and dysfunction. We and others have demonstrated that microfluidic and micro-patterning techniques for neuronal cell culture allows a deterministic control of neuronal polarity and the possibility to reconstructs fully functional rodent and human neuronal pathways in vitro, thus bridging the gap between in vivo and in vitro models. Here I will present results illustrating the development of new 2D and 3D Brain on Chip platform and their potential interest to model Prion Like propagation of Synuclein aggregates along minimalistic neural pathways.

Keywords:

2D & 3D Brain, Axon, Growth, Regeneration

Stay tuned