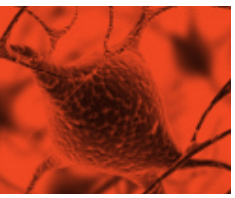

PROJECTS RECOMMENDED FOR FUNDING

MICRODEG \\ Neuronal Networks in microfluidic chips for the study of propagative neuronal disorders

Austria\ Belgium\ Canada\ Finland\ France\ Germany\ Israel\ Italy\ Luxembourg\ Poland\ Portugal\ Romania\ Spain

Neurological syndromes such as Alzheimer, Parkinson and Huntington diseases shares similar degenerative signatures by promoting progressive aggregation of endogenous proteins in the brain. Recent evidences have shown that similarly to infectious prion diseases, pathological hallmarks of these syndromes spread progressively along neuronal pathways in the brain. The reason underlying theses processes are unknown. They could involve several non exclusive phenomena ranging from abnormal synaptic transmission, progressive disconnection of neuronal hubs; to the spreading of aggregated proteins in between neurons. While these processes are classically studied in whole animals, reliable in vitro model that allows the precise and fast study of molecular and cellular responses in an ordered environment are lacking. Using cutting edge technologies we propose to develop micro-brain platforms allowing the in vitro reconstruction and manipulation of both rodent and human neuronal networks. These new experimental systems will be used to study the underlying mechanisms involved in the spatial progression of neurodegenerative hallmarks of Parkinson and Huntington diseases and test whether scenario proposed in mouse models (prion-like propagation) are pertinent for human. Overall in addition to the testing of a fundamental biology question, the proposed project goes with the trend of building “organ on chips” that are envisioned to allows production accurate models for the study of human diseases.

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