

Brain-on-a-chip: dream or reality? Recent advancements using MEA technology to engineer complex 2D and 3D neuronal assemblies

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The brain is characterized by the presence of different neuronal populations (e.g., cortical, hippocampal neurons) which interact following well-defined principles of connectivity. In this talk, I will present recent advancements to engineer *in vitro* networks of interconnected neuronal assemblies to MEAs keeping three fundamental properties of the brain: heterogeneity, three dimensionalities, and modularity. This approach paves the way to recreate interconnected brain-regions-on-a-chip providing insights to understand the mechanisms at the basis of the interactions among neuronal populations.