**In vitro** neural tissue testing platform using Micro-Electrode Arrays

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Today, drug discovery and toxicity assessment of compounds/molecules is still lacking efficient methods and biological models allowing relevant long-term effects of compounds to be discovered and evaluated, especially when linked to the brain. A novel electrophysiology platform addressing this need by **in vitro** monitoring of 3D tissues derived from human iPS cells has been developed. As it generates very large amounts of data, efficient and fast data analysis methods allowing relevant feature extraction have been developed.

**In vitro** human tissue model: 2D and 3D cell/tissue cultures from iPS cells

Electrophysiology recording system based on Micro-Electrode Arrays (MEA)

Microfabricated porous MEA devices integrating 2D or 3D platinum electrodes geometries.

Data analysis tools and biological results

Semi-automated high throughput data analysis platform to reduce data analysis burden.

Typical biological signal shapes and activity levels from 2D and 3D MEA devices.

Typical signal shapes of single unit activity (spikes)

Number of single units per electrode per well