



Thesis Project Form

Title (tentative): Understanding plasticity mechanisms of post-gene therapy: electrophysiology and neural data analysis

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Description

Motivation and application domain

Two are the main objectives of this thesis work:

- (1) Finding novel gene therapy approaches for intractable neurological diseases (such as epilepsy), with rapid potential for translation.
- (2) Investigating the pathophysiological mechanisms of epilepsy disease and then use novel insights to develop and improve therapeutic tools to cure them.

General objectives and main activities

The student will be involved in experimental activities and data analysis related to understanding the plasticity mechanisms undergoing post-gene therapy for treating epilepsy.

More specifically, the student will: (1) take part to experiments done in vivo with the usage of novel high density MEAs (e.g. Neuropixel probes) which will record the electrophysiological signals from large neuronal assemblies; (2) perform code development and (3) data analysis of the obtained measurements, to help interpretation of scientific results.

Training Objectives (technical/analytical tools, experimental methodologies)

The student will be instructed on how to perform in vivo experiments, how to analyze the neural data, how to compute biomarkers of interests from electrophysiological recordings from HD-MEA in vivo.

Place(s) where the thesis work will be carried out: UCL "University College London (UK)

Additional information

Pre-requisite abilities/skills: MATLAB programming skills, signal processing, statistics, attitude to experimental work

Maximum number of students: 1

Financial support/scholarship: Erasmus grant