



RESEARCH TOPIC MEM 18

Investigating spontaneous activity during cortical development Curriculum MEM

Laboratory name

Developmental Neurobiology Lab

Pre-clinical Supervisor

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Abstract

Spontaneous activity is a prominent feature of the immature brain. Even before birth and in absence of stimuli, neurons organize in networks and spontaneously generate correlated activity. While spontaneous dynamics in the cerebral cortex have long been overlooked and considered just as epiphenomena, recent clinical data on preterm infants and preclinical studies have spurred a renewed interest for this early electrical activity. However, appreciation of the role of spontaneous activity during the perinatal stages remains elusive. The project aims to shed light on how cortical neuronal diversity influences early spontaneous activity, and to identify the molecular features and functional role of developing neurons. By integrating innovative molecular strategies with in vivo optical recordings (2-photon) and behavioural assays, we will characterise and spatially resolve the subtype-specific molecular footprints correlated with electrical profiles of neuron subtypes.

Main technical approaches

Two photon in vivo imaging, murine models, genetically encoded calcium sensor, in utero electroporation, transcriptomics, histology

Type of contract

PhD scholarship of € 18.000 gross per year awarded by Humanitas University. This sum is exempt from IRPEF income tax according to the provisions of art. 4 of Law no. 476 of 13th August 1984, and is subject to social security contributions according to the provisions of art. 2, section 26 and subsequent sections, of Law no. 335 of 8th August 1995 and subsequent modifications.

Borsa di dottorato pari a € 18.000 annui lordi erogata da Humanitas University. Importo non soggetto a tassazione IRPEF a norma dell'art. 4 della L. 13 agosto 1984 n. 476 e soggetto, in materia previdenziale, alle norme di cui all'art. 2, commi 26 e segg., della L. 8 agosto 1995, n. 335 e successive modificazioni.