Master de Sciences et Technologies
Mention Biologie Intégrative et Physiologie
Parcours : Neurosciences
Responsable : Professeur Régis Lambert

Internship Proposal
Academic Year 2018-2019

1. **Host team :Cellular mechanisms of sensory processing**

Research Unit (e.g. Department or Institute) :
Research Unit Director : Alexis Brice
Research Team Director : Nelson Rebola
Team name : **Cellular mechanisms of sensory processing**

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2. **Internship project title:**

Impact of NMDA receptor diversity in sensory information processing

3. **Internship Description :**

The synaptic diversity between neuronal connections is thought to contribute to the brain remarkable information processing capacities. In the adult brain, the density as well as subunit composition of synaptic NMDA receptors (NMDARs) varies considerably between synapses and between neurons. However, how such variability shapes information processing is not known. Cortical activity is under the tight control of a highly heterogeneous population of GABAergic interneurons. Interestingly, recent works have revealed that NMDARs receptors are particular abundant in 5-HT3AR positive interneurons. The functional relevance for the high levels of NMDARs in this particular GABAergic interneuron population is not known.

The overall goal of this master is to use state of the art electrophysiological and imaging techniques, to evaluate the functional impact of NMDARs in the activity of cortical 5-HT3AR positive interneurons.

Notably, during this project the student will use two-photon imaging together with electrophysiological approaches in transgenic mouse models to quantify the participation of NMDARs to the recruitment, intracellular calcium dynamics as well as plasticity properties of layer 1 5-HT3AR positive interneurons in the primary somatosensory cortex. This work is expected to provide an original and important data set on the cellular mechanisms involved in the activation of 5-HT3AR positive interneurons whose functional role in cortical information processing is still mostly unknown

Ultimately the *in vivo* relevance of those possible findings will be pursued during a PhD project.