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 :

Research Unit (e.g. Department or Institute) : Institut du Fer à Moulin (INSERM Unit 839)
Research Unit Director : Jean-Antoine GIRAULT
Research Team Director : Christine METIN
Team name: Migration of Cortical Interneurons

Address : 17, Rue du Fer à Moulin, 75005 Paris

Supervisor of the Research Intern for this project: co-supervisors C. Métin and Justine Masson (HDR)
Telephone : 01 45 87 61 26 (C. Métin) / 01 45 87 61 25 (J. Masson)
E-mail : christine.metin@inserm.fr / justine.masson@inserm.fr

2. Internship project title:

Modulation of cortical interneuron migration during development by dopamine signaling.

3. Internship Description :

Prefrontal cortex (PFC) dysfunction has been involved in the cognitive deficits at the core of schizophrenia. The cause of this PFC dysfunction is largely unknown but an attractive hypothesis proposes that it results from an altered development of neuronal circuits. Defects in parvalbumin-positive (PV) GABAergic interneurons have been reported in the PFC of schizophrenic patients. These cortical interneurons undergo a complex and long distance migration during development. Alteration in this migratory process can disrupt the final distribution of GABAergic interneurons in the cortex. The aim of the proposal is to investigate the role of the dopamine neurotransmission mediated by D1 receptors (D1R) in the migration of interneurons. The study will focus on interneurons generated in the medial ganglionic eminence of the basal forebrain, that later differentiate as parvalbumin- and somatostatin-positive interneurons.

Using a D1R-GFP mouse strain, we will characterize which cells express D1R in the developing cortex (excitatory cells, and/or tangentially migrating GABAergic neurons). To determine the identity and regional distribution of D1R-expressing cells in the developing cortex, experiments will combine immunostaining in D1R-GFP mice, and analyses in animals born from crosses between mice expressing a fluorescent marker (mRFP) in MGE-derived interneurons and D1R-GFP mice.

The second objective of the proposal will be to determine whether the lack of D1Rs activity in either cortical cells, the migration substrate of interneurons, or migrating interneurons influences the dynamics of migrating interneurons. This question will be addressed in *in vitro* models using a D1R KO mouse strain.

Results will help to further understand the role of D1R in the cortical migration of GABAergic interneurons