MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2022-2023

(internship from January to June 2023)

Host laboratory:
INSERM U1208, Stem cell and Brain Research Institute - SBRI,
Directeur: Dr. Colette Dehay

18 avenue du Doyen Lépine, 69500, Bron

Host team :
Equipe d'accueil: « Cellular programming in the brain »

http://www.sbri.fr/

Internship supervisors : *name + position + email*
Olivier Raineteau, DR2, olivier.raineteau@inserm.fr

Project title :
Whole brain quantifications of cell responses to adverse conditions.

**Project summary :** *approx 10 lines*

Big data is a field that treats ways to analyze, systematically extract information from data sets that are too large or complex to be dealt with by traditional data-processing approaches. Big data has gradually invaded all domains of neurosciences, from transcriptomic to histology. In histology, this applies to large series of sections that need to be analyzed so that cell numbers can be accurately quantified, while minimizing the time of processing.

The hosting lab works on the long-term consequences of perinatal brain injuries. These consequences can be multiple, ranging from abnormal development of brain cells (e.g. oligodendrocytes) to abnormal neuronal circuits formation. These perinatal brain injuries result in long-term secondary sequels that remains to be fully characterized.

During this training period, you will apply a recently developed approach for whole brain quantifications of oligodendrocytes and/or active neurons. Comparison of control mice to perinatal injured mice, will allow you to spatially and quantitatively explore the consequences of adverse conditions on brain development and functioning.

By the end of this training period, you will have acquired knowledge in histological techniques routinely used in most laboratories. You will know to prepare tissues, acquire mosaic images and to find your way in a complex tissue such as the brain. In addition, you will have acquired a unique expertise in big data handling which represents a promising development of image analysis in neurosciences.

Please send your proposal to marion.richard@univ-lyon1.fr for publication on the Master of Neuroscience website.
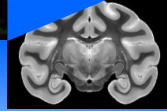
3-5 recent publications :

• Donega, V., Marcy, G., Lo Giudice, Q., Zweifel, S., Angonin, D., Fiorelli, R., Abrous, D. N., Rival-Gervier, S., Koehl, M., Jabaudon, D. et al. (2018). Transcriptional Dysregulation in Postnatal Glutamatergic Progenitors Contributes to Closure of the Cortical Neurogenic Period. Cell Reports 22, 2567-2574.

• Azim, K., Angonin, D., Marcy, G., Pieropan, F., Rivera, A., Donega, V., Cantu, C., Williams, G., Berninger, B., Butt, A. M. et al. (2017). Pharmacogenomic identification of small molecules for lineage specific manipulation of subventricular zone germinal activity. PLoS Biol 15, e2000698.

• Azim K, Hurtado-Chong A, Fischer B, Kumar N, Zweifel S, Taylor V, Raineteau O (2015) Transcriptional Hallmarks of Heterogeneous Neural Stem Cell Niches of the Subventricular Zone. Stem Cells. 33(7):2232-42

• Fiorelli R, Fischer B, Azim K, and Raineteau O (2015) Adding a spatial dimension to postnatal ventricular-subventricular zone neurogenesis. Development, 142(12):2109-20

• Brill MS, Ninkovic J, Winpenny E, Hodge RD, Ozen I, Yang R, Lepier A, Gascón S, Erdelyi F, Szabo G, Parras C, Guillemot F, Frotscher M, Berninger B, Hevner RF, Raineteau O, Götz M. (2019) Adult generation of glutamatergic olfactory bulb interneurons. Nat Neurosci. 12(12):1524-33.

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