

**MASTER 2 Neurosciences Fondamentales et Cliniques
UCB Lyon 1, Lyon, France**

**Internship proposal 2020-2021
(internship from January to end of May 2021)**

Host laboratory:

Laboratory of Dr. Frederic Bretzner
CHU de Québec-Université Laval
CHUL, Neurosciences, P-09800
2705, Blvd. Laurier
Quebec City, QC
CANADA, G1V 4G2

Host team :

Laboratory of Dr. Frederic Bretzner
<http://www.crchudequebec.ulaval.ca/en/research/researchers/frederic-bretzner/>

Internship supervisors :

Dr. Frederic Bretzner
frederic.bretzner.1@ulaval.ca

Project title : Plasticity of midbrain and brainstem pathways after spinal cord injury

Project summary :

Our primary goal is to get a better understanding of the neural control of movement with a focus on the motor cortex, the brainstem, and the spinal cord. We use a combination of genetic, molecular, anatomical, optogenetic and electrophysiological techniques to study the motor control in the mouse. Our analysis ranges from the ionic channels, neurons, neural networks to the motor behavior. Our studies focus on the normal physiology with the long-term aim of restoring motor function and especially locomotion following central nervous system injury or diseases that affect gait.

The aim of the project is to identify and characterize the neural mechanisms underlying postural adjustments and functional locomotor recovery following spinal cord injury. Using a combination of kinematic and electrophysiological techniques with discrete optogenetic manipulations in transgenic mice, we will identify, localize, and characterize changes in the midbrain and brainstem pathways contributing to functional postural and locomotor recovery after neurotraumatic injury.

Please send your proposal to emiliano.macaluso@univ-lyon1.fr and marion.richard@univ-lyon1.fr for publication on the website.

3-5 recent publications :

- 1 Lemieux M, Bretzner F. Glutamatergic Neurons of the Gigantocellular Reticular Nucleus Shape Locomotor Pattern and Rhythm in the Freely Behaving Mouse. PloS Biology. 2019. In press.
- 2 Josset N, Roussel M, Lemieux M, Lafrance-Zoubga D, Rastqar A, Bretzner F. Distinct Contributions of Mesencephalic Locomotor Region Nuclei to Locomotor Control in the Freely Behaving Mouse. Curr Biol. 2018 Mar 7.
- 3 Lemieux M, Josset N, Roussel M, Couraud S, Bretzner F. Speed-Dependent Modulation of the Locomotor Behavior in Adult Mice Reveals Attractor and Transitional Gaits. Front Neurosci. Frontiers; 2016;10.