

**MASTER 2 Neurosciences Fondamentales et Cliniques****Internship proposal 2021-2022***(internship from January to end of May 2022)***Host laboratory:** CRNL, Bâtiment 462 - Neurocampus - CH le Vinatier, 95 bd Pinel, Bron-Lyon**Host team :** Sleep Team**Internship supervisors :** Nadia Urbain, CR1 INSERM, nadia.urbain@inserm.fr,
<https://nadiaurbainlab.wordpress.com/>)**Project title :** Sensory gating in thalamic relay nuclei by the motor cortex**Project summary :**

Using the anatomically well-defined whisker somatosensory system as a model and a combination of state-of-art electrophysiological methods with optogenetics in head-fixed mice, the project aims to investigate the gating of sensory information at the level of the thalamus during wakefulness and sleep. This project proposes to explore the firing activity and responses to free-whisking and passive whisker deflection of incertal cells, a potential source of inhibition onto thalamic cells. The contingency of the neuronal activity on motor inputs will be further investigated using optogenetics. The M2 candidate will familiarize him(her)self with electrophysiological techniques (extracellular and local field potential recordings, EEG-EMG) in non-anesthetized head-fixed mice. We are searching for an applicant with a high commitment and curiosity about neuroscientific questions.

Publications related to the project :

N. Urbain, N. Fourcaud-Trocmé, S. Laheux, P.A. Salin and L.J. Gentet. Brain-state-dependent modulation of neuronal

firing and membrane potential dynamics in the somatosensory thalamus during natural sleep.

Cell Report, 2019, 26: 1443-1447.

N. Urbain, P.A. Salin, P.A. Libourel, J.C. Comte, L.J. Gentet and C.C. Petersen. Whisking-related changes in neuronal firing and membrane potential dynamics in the somatosensory thalamus of awake mice.

Cell Report, 2015, 13: 647-656.

N. Urbain and M. Deschênes. Motor cortex gates vibrissal responses in a thalamocortical projection pathway.

Neuron, 2007, 56: 714-725.

P. Lavallée, N. Urbain, C. Dufresne, H. Bokor, L. Acsádi and M. Deschênes. Feedforward inhibitory control of sensory information in higher order thalamic nuclei,

Journal of Neuroscience, 2005, 25: 7489-7498.

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