

MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2023-2024

(internship from January to June 2024)

Host laboratory: Lyon Neuroscience Research Center CRNL. Inserm U1028 - CNRS UMR5292 - UCBL. Centre Hospitalier Le Vinatier - Bâtiment 462 - Neurocampus. 95 boulevard Pinel. 69675 Bron Cedex

Host team : WAKING. https://www.crnl.fr/fr/equipe/waking

Internship supervisors : Audrey HAY, Chercheur CNRS, audrey.hay@cnrs.fr

Project title : To investigate midline thalamic neurons firing during sleep and wake in an Alzheimer disease mouse model

Project summary : Sleep is impaired in Alzheimer patients, showing an increase of fragmentation and a decrease of the deepest sleep stages duration. We demonstrated the involvement of midline thalamus in deep sleep stages maintenance (Hay et al., 2021) and the stimulation of thalamic GABAergic neurons reduces sleep fragmentation and promotes ß-Amyloid clearance in mice (Jagirdar et al., 2021).

Thus we hypothesise that midline thalamus activity could be altered in Alzheimer disease leading to sleep deficit. In this project, we will test this hypothesis by recording thalamic neurons firing using either silicon probes or tetrodes recordings in naturally sleeping mice. We will compare how thalamic neurons fire (tonic versus bursting activity) during different sleep stages but also relative to sleep oscillations (slow oscillations, spindles and ripples) as these oscillations play a fundamental role in sleep associated cognitive processes.

3-5 recent publications :

Jarzebowski P, Hay YA, Grewe BF, Paulsen O (2022) Different encoding of reward location in dorsal and intermediate hippocampus. Current Biology. 32(4):834-841.e5.

Hay YA, Deperrois N, Fuchsberger T, Quarrell TM, Koerling AL, Paulsen O (2021) Thalamus mediates neocortical Down state transition via GABAB-receptor-targeting interneurons. Neuron. 109 (17), 2682-2690.e5.

Jarzebowski P*, Tang CM*, Paulsen O, Hay YA (2021) Impaired spatial learning and suppression of sharp wave ripples by cholinergic activation at the goal location. eLife 10, e65998.

Please send your proposal to <u>marion.richard@univ-lyon1.fr</u> for publication on the Master of Neuroscience website.