



MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2023-2024

(internship from January to June 2024)

Host laboratory: *Stem Cell and Brain Research Institute (SBRI), Inserm U1208*

Host team : *Building the Cerebral Cortex: Connectomics; <https://sbri.fr/teams/building-the-cerebral-cortex-connectomics/>*

Internship supervisors : *Julien Vezoli, Chercheur, julien.vezoli@inserm.fr; Henry Kennedy, DRCE, henry.kennedy@inserm.fr*

Project title : *The Claustrum as a hub orchestrating state-dependent cortical network dynamics.*

Project summary : *The wide-spread connectivity of the claustrum with the cortex led to the suggestion that it is involved in higher-cognitive functions including consciousness. Here we undertake physiological experiments to address the role of the claustrum in cortical function of primates. Preliminary work of the team on the spatial embedding of the claustrum in the cortical network shows unexpected primate-specific features in the integration of the claustrum into the interareal cortical network. We will address if the claustrum plays a privileged role in higher-cognitive functions through the orchestration of large-scale functional connectivity interactions by using multi-site simultaneous recordings of a large number of cortical areas together with the claustrum while distinguishing different behavioral and task states in awake behaving non-human primates.*

3-5 recent publications :

- Vezoli J, Vinck M, Bosman CA, Bastos AM, Lewis CM, Kennedy H, Fries P. Brain rhythms define distinct interaction networks with differential dependence on anatomy. *Neuron*. 2021 Dec 1; 109(23):3862-3878.e5.

- Vezoli J, Magrou L, Goebel R, Wang X-J, Knoblauch K, Vinck M, Kennedy H. Cortical Hierarchy, Dual Counterstream Architecture and The Importance of Top-Down Generative Networks. *Neuroimage*. 2021; 225:117479.

- Michalareas G, Vezoli J, van Pelt S, Schoffelen JM, Kennedy H, Fries P. Alpha-beta and gamma rhythms subserve feedback and feedforward influences among human visual cortical areas. *Neuron*. 2016 Jan 20;89(2):384-97.

- Bastos AM, Vezoli J, Bosman CA, Schoffelen JM, Oostenveld R, Dowdall JR, De Weerd P, Kennedy H, Fries P. Visual areas exert feedforward and feedback influences through distinct frequency channels. *Neuron* 2015; 85(2):390-401.

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