



MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2024-2025

(internship from January to June 2025)

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

18 av. Doyen Jean Lépine, 69500, Bron

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

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

Project title : *The Claustrum as a hub orchestrating 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 anatomical features in the integration of the claustrum into the interareal cortical network. We will address how the claustrum plays a privileged role in the orchestration of large-scale functional connectivity interactions by analyzing resting-state fMRI data already acquired in several non-human primates. The intern will learn how to analyze high-quality brain imaging data according to the Human Connectome Project standards and to produce functional connectivity maps. Results will be put in perspective to the anatomical connectome dataset already acquired by the team.*

3-5 recent publications :

- Vezoli J, Hou Y, Kennedy H. *The Evolving Concept of Cortical Hierarchy. In The Cerebral Cortex and Thalamus, W. Martin Usrey, S. Murray Sherman, eds. (Oxford University Press), 2023, pp 393-404. ISBN: 9780197676158*

- 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.

- Hayashi T, Hou Y, Glasser MF, Autio JA, Knoblauch K, Inoue-Murayama M, Coalson T, Yacoub E, Smith S, Kennedy H, Van Essen DC, *The nonhuman primate neuroimaging and neuroanatomy project*. *NeuroImage*. 2021; 229:117726.