

MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2025-2026

(internship from January to June 2026)

Host laboratory: Centre de Recherche en Neurosciences de Lyon (CRNL), CH Le Vinatier - Bâtiment 462 - Neurocampus, 95 Bd Pinel, 69500 Bron.

Host team : IMPACT team, 16 avenue du Doyen Jean Lépine, 69500 Bron.

Internship supervisors : Gérard Derosière, Chercheur INSERM (CRCN), Email : gerard.derosiere@gmail.com & Margaux Nussbaumer, PhD Student (UCBL), Email : margaux.nussbaumer@univ-lyon1.fr (please contact both supervisors if you are interested in the internship)

Project title : Identifying oscillations frequencies and networks involved in effort-based decision-making process in humans with MEG

Project summary :

From insects to rodents to humans, animals must constantly decide whether to engage in physical efforts to reach rewarding goals. This process – referred to as effort-based decision-making – is dysfunctional in apathy, a syndrome characterized by a reduced propensity to initiate effortful actions, with a huge prevalence in a large number of neurological and psychiatric disorders. Yet, the neural bases, particularly the oscillatory frequencies and fronto-striatal circuits critical for effort-based decisions, and thus of apathy, remain unclear. The project will identify frequency-specific synchrony (e.g., theta, gamma, beta) and circuit involvement (e.g., orbitofrontal-striatum, supplementary motor area-striatum) using records of oscillatory activity with magnetoencephalography (MEG).

3-5 recent publications :

1. **Derosiere, G.**, Shokur, S., & Vassiliadis, P. (2025). Reward signals in the motor cortex: from biology to neurotechnology. *Nature Communications*, 16(1), 1-15.
2. Neige C, Yadav G., **Derosiere G.** (2023). The oscillatory nature of movement initiation. *The Journal of Neuroscience*.
3. **Derosiere G**, Thura D, Cisek P, Duque J. (2022). Hasty sensorimotor decisions rely on an overlap of broad and selective changes in motor activity. *PLOS Biology*, 20(4), e3001598.
4. **Derosiere G**, Duque J. (2020). Tuning the corticospinal system: how distributed brain circuits shape human actions. *The Neuroscientist*, p. 1073858419896751.