# MASTER 2 Fundamental and Clinical Neurosciences

# Internship proposal 2024-2025

*(internship from January to June 2025)*

**Host laboratory:**

Lyon Neurosciences Research Center

Université Claude-Bernard Lyon1 – Inserm U1028 – CNRS UMR5292

Centre Hospitalier Le Vinatier - Bâtiment 462 - Neurocampus Michel Jouvet

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**Host teams:**

CAP - Cognition Auditive et Psychoacoustique

**Internship supervisors:**

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**International co-supervision:**

Laboratory of Research in Neuroimaging, Université de Lausanne

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**Project title:** Cognitive and conscious dissociation in patients with a disorder of consciousness

**Project summary:**

Patients with a disorder of consciousness represent an important human, social, and economic issue. Improving diagnosis, prognosis, and treatment of these patients has become a major challenge for research. EEG techniques, coupled with AI (clustering, decoding, deep learning), promise a better understanding of brain signals. In particular, they could help us better dissociate residual cognitive and conscious processes.

The project aims to compare, in a cohort of 150 patients (from coma to conscious state with and without delirium), the brain activity in three different conditions: at rest, when presenting neutral or emotional sounds.

During the internship, the MSc student will use Python scripts for analyzing EEG (ERPs, connectivity) and for decoding the signal (AI).

**Publications**

Claassen J, Doyle K, Matory A, Couch C, Burger KM, Velazquez A, et al. Detection of Brain Activation in Unresponsive Patients with Acute Brain Injury. N Engl J Med 2019; 380(26): 2497-505.

Chennu S, Finoia P, Kamau E, Allanson J, Williams G, Monti M, et al. Spectral signatures of reorganised brain networks in disorders of consciousness. PLoS Comput Biol. 2014; 10(10): e1003887.

Ferré F, Heine L, Naboulsi E, Gobert F, Beaudoin-Gobert M, Dailler F, et al. Self-processing in coma,

unresponsive wakefulness syndrome and minimally conscious state. Front Hum Neurosci. 2023; 17: 1145253.

Ferré F, Buffières W, Heine L, Riu B, Curot J, Corneyllie A, et al. Impairment of central language processing in critically ill coronavirus disease 2019 patients with delirium. Brain Commun. 2023; 5(2): fcad073.

Tzovara A, Simonin A, Oddo M, Rossetti AO, De Lucia M. Neural detection of complex sound sequences in the absence of consciousness. Brain. 2015 May;138(Pt 5):1160-6. doi: 10.1093/brain/awv041.