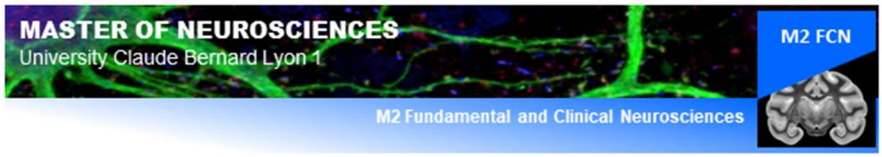


# MASTER 2 Fundamental and Clinical Neurosciences

## Internship proposal 2024-2025

*(internship from January to June 2025)*

**Host laboratory:** *ISC-MJ*
Institute of Cognitive Sciences Marc Jeannerod, CNRS UMR 5229
67 Boulevard Pinel 69675 Bron Cedex

**Host team :** Neural and cognitive control of action

http://www.isc.cnrs.fr/index.rvt?teamid=neural%5Fand%5Fcognitive%5Fcontrol%5Fof%5Faction&team=research

**Internship supervisors: Irene Cristofori, Associate Professor, icristofori@isc.cnrs.fr; Bertrand Beffara, postdoc, bbeffara@isc.cnrs.fr**

**Project title: Modulating social pain**

**Project summary:** Social pain and loneliness are a public major concern, especially during and after the pandemic period when individuals have faced a long period of social exclusion and isolation. Social pain refers to the painful feelings accompanying social disconnection, exclusion, or loss. These feelings are rooted in our brain. For instance, the mere fact of imagining that we are excluded triggers social pain and activates the anterior insula, the anterior cingulate cortex, and the prefrontal cortex, crucial for physical pain as well (Cristofori et al., 2013; 2015), and focal lesions to these regions decrease social pain perception (Cristofori et al. 2018). Although social pain neural networks are well-defined, the underlying modulating mechanisms are far from being understood. To date, only a few studies have investigated the factors that can mitigate social pain. Recent studies showed that physical pain can be reduced by modulating the interoceptive system using transdermal auricular vagus nerve stimulation (tVNS). The main goal of the project is to understand whether tVNS can reduce the perception of social pain, which will provide a valuable cutting-edge tool for clinical research in social pain.

**3-5 recent publications:**

**Cristofori, I.,** Pal, S., Zhong, W., Barry, G., Krueger, F., & Grafman, J. (2019). The Lonely Brain: evidence from studying patients with penetrating brain injury. *Social Neuroscience*, 14 (6), 663-675.

**Cristofori, I.**, Harquel, S., Isnard, J., Mauguière, F., & Sirigu, A. (2015). Monetary reward suppresses anteriorinsula activity during social pain. *Social Cognitive Affective Neurosciences*, 10(12):1668-76. doi: 10.1093/scan/nsv054.

**Cristofori, I.**, Moretti, L., Harquel, S., Posada, A., Deiana, G., Isnard, J., Mauguière, F., Sirigu, A. (2013). Theta signal as the neural signature of social exclusion. *Cerebral Cortex* 23(10), 2437-2447. doi: 10.1093/cercor/bhs236.