

MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2025-2026

(internship from January to June 2026)

Host laboratory:

Institute of Cognitive Sciences Marc Jeannerod
67 Boulevard Pinel, 69500, BRON

Host team:

Neural and cognitive control of action

<https://www.universite-lyon.fr/ils-font-l-universite-de-lyon-irene-cristofori--110423.kjsp>

Internship supervisors:

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Project title:

"Psychophysiology of social pain: markers and inter-individual variability"

Project summary :

Our recent pilot study (see <https://osf.io/bkt32/> for the project preregistration) relied on 1) the rationale that the effect of taVNS on physical pain is growingly admitted (Frangos et al., 2017) and that social and physical pains share neural mechanisms (Eisenberger, 2012) and 2) the effects of taVNS on cognition (Ridgewell et al., 2021) and emotional and social processing (Maraver et al., 2020), suggesting that taVNS could modulate social exclusion-related psychological processing. However, social exclusion is a complex and abstract situation that elicits various possible psychological reactions and recruits multiple "higher" cognitive functions. This ultimately leaves room for several possible confounds, which need to be controlled. Based on the study of Sellaro et al. (2015), we identified two main caveats pertaining to the study of taVNS in social contexts. First, the psychological traits of the participants can lead to substantial response differences in social contexts. Secondly, the physiological effects of taVNS often are not recorded, which implies that one cannot rule out the possibility that taVNS does not elicit substantial physiological changes, hence leading to null effects at the psychological level (see Sellaro et al., 2015). The recruited intern will contribute to data collection with human participants using taVNS, eyetracking, pupillometry, and questionnaire tools, with the aim of performing rigorous control analyses using different types (eye-gaze, pupil size, psychological traits assessment) of covariates. This work will contribute to improve research practices in the domain of social cognition.

3-5 recent publications:

- Eisenberger, N. I. (2012). The neural bases of social pain : Evidence for shared representations with physical pain. *Psychosomatic Medicine*, 74(2), Article 2. <https://doi.org/10.1097/PSY.0b013e3182464dd1>
- Frangos, E., Richards, E. A., & Bushnell, M. C. (2017). Do the psychological effects of vagus nerve stimulation partially mediate vagal pain modulation? *Neurobiology of Pain*, 1, 37-45. <https://doi.org/10.1016/j.ynpai.2017.03.002>
- Maraver, M. J., Steenbergen, L., Hossein, R., Actis-Grosso, R., Ricciardelli, P., Hommel, B., & Colzato, L. S. (2020). Transcutaneous vagus nerve stimulation modulates attentional resource deployment towards social cues. *Neuropsychologia*, 143, 107465. <https://doi.org/10.1016/j.neuropsychologia.2020.107465>
- Ridgewell, C., Heaton, K. J., Hildebrandt, A., Couse, J., Leeder, T., & Neumeier, W. H. (2021). The effects of transcutaneous auricular vagal nerve stimulation on cognition in healthy individuals : A meta-analysis. *Neuropsychology*, 35(4), 352-365. <https://doi.org/10.1037/neu0000735>
- Sellaro, R., Steenbergen, L., Verkuil, B., Van IJzendoorn, M. H., & Colzato, L. S. (2015). Transcutaneous Vagus Nerve Stimulation (tvNS) does not increase prosocial behavior in Cyberball. *Frontiers in Psychology*, 06. <https://doi.org/10.3389/fpsyg.2015.00499>