MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2026-2027

(internship from January to June 2027)

Host laboratory: Neuro-Dol UMR 1107 INSERM/UCA, 2 rue de Braga 63100 Clermont-Ferrand

Host team: Equipe Douleur Trigéminale et Migraine, https://neurodol.fr/equipe-douleur-trigeminale-et-migraine/

Internship supervisors:
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Project title: Investigating and optimizing neuromodulation for pain relief

Project summary :

Neuropathic pain affects between 7% and 10% of the general population and is difficult to treat once it has developed. Neuromodulation techniques can provide relief for patients who do not respond to drug treatments, although some patients also remain non-responders to these neuromodulation techniques. It is therefore necessary to better understand the mechanisms of action of these techniques to increase the number of responders and improve their identification.
These neuromodulation techniques are most effective when applied to the precentral cortex (i.e. “primary motor cortex- M1”). One of the project’s objectives will be to use fMRI to better characterize the target areas in M1 based on their functional connectivity with the brain regions involved in pain perception. The second objective will be to assess the analgesic effect of stimulating these areas using neuromodulation techniques (tDCS: transcranial direct current stimulation; rTMS: repetitive transcranial magnetic stimulation; fUS: focal ultrasound) within the framework of ongoing clinical trials conducted by the team.

3-5 recent publications:

Thomas, J., Fauchon, C., Oriol, N., Vassal, F., Créac’h, C., Quesada, C., and Peyron, R. (2025). Effects of multiple transcranial magnetic stimulation sessions on pain relief in patients with chronic neuropathic pain: A French cohort study in real-world clinical practice. Eur J Pain. https://doi.org/10.1002/ejp.4763.

Peyron, R., Corvin, S., Fauchon, C., and Faillenot, I. (2025). Investigating brain dysfunction in neuropathic pain with MRI. Brain Communications *7*, fcaf196. https://doi.org/10.1093/braincomms/fcaf196.

Soliman, N., Moisset, X., Ferraro, M.C., de Andrade, D.C., Baron, R., Belton, J., Bennett, D.L.H., Calvo, M., Dougherty, P., Gilron, I., et al. (2025). Pharmacotherapy and non-invasive neuromodulation for neuropathic pain: a systematic review and meta-analysis. The Lancet Neurology *24*, 413–428. https://doi.org/10.1016/S1474-4422(25)00068-7.

Fauchon, C., Meunier, D., Rogachov, A., Hemington, K.S., Cheng, J.C., Bosma, R.L., Osborne, N.R., Kim, J.A., Hung, P.S.-P., Inman, R.D., et al. (2021). Sex differences in brain modular organization in chronic pain. PAIN *162*.

Modernell, L. M., Faillenot, I., Garcia-Larrea, L., and Fauchon, C. (2026). The multifaceted neural architecture of pain modulation by emotion and cognition: a systematic review and meta-analysis. British Journal of Anaesthesia.