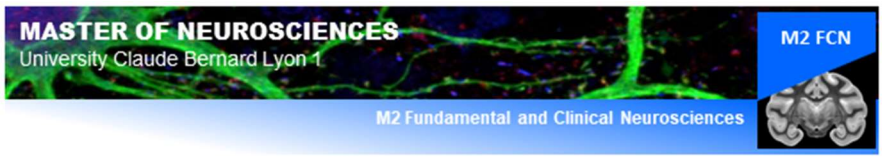

Université Claude Bernard Lyon 1

MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2025-2026

(internship from January to June 2026)

Host laboratory: Biomedical Neuroscience Lab, based at the Institute of Biophysics and Biomedical Engineering of the Faculty of Sciences of the University of Lisbon. Address: Campo Grande 016, 1749-016 Lisboa, Portugal

Host team: Biomedical Neuroscience Lab, PI: Dr Diana Prata, https://dpratalab.wordpress.com/

Internship supervisors: Dr Diana Prata

Principal Investigator and Group Leader, Institute of Biophysics and Biomedical Engineering of the Faculty of Sciences of the University of Lisbon.

Visiting Lecturer at Institute of Psychiatry, Psychology and Neuroscience, King's College of London, UK.

diana.prata@kcl.ac.uk

Project title: The Neurobiology of Social Cognition (https://dpratalab.wordpress.com/projects/)

Project summary:

Keywords. Oxytocin, dopamine, genetics, neuropharmacology, neuroimaging, psychophysiology, empathy, theory-of-mind, trust, cooperation, dance, reward, reinforcement learning, social cognition, emotion recognition, schizophrenia, autism, psychopathy.

Context. Understanding the neurochemistry and circuitry mediating social cognition is key to treat a large range of neuropsychiatric disorders – as social deficits are often present at their origin and often do not subside with treatment. Working out what others think, intend and feel (i.e. cognitive empathy or theory-of-mind) is essential for optimal communication and cooperation and is dysfunctional in a range of mental heath conditions. The lab's interest is understanding the biological underpinnings of human behaviour, in particular, social, which we aim to translate into improving etiological and therapeutic models of neuropsychiatric disorders and human well-being. We are characterizing what molecules and brain pathways are involved in social cognition, for example: how does oxytocin promote cognitive empathy? Where does it act? What effect does it have in brain? How does it interact with other neurotransmitter systems? What exact social cognitive processes does it modulate?

Tools. We study healthy humans, and individuals with psychiatric conditions, with structural and functional neuroimaging (MRI and DTI), eye-tracking, pupilometry, skin conductance, EEG, ECG, genetic and proteomic testing and computational modelling – in double blind placebo-controlled pharmacological administration using psychological stimuli in a range of social cognition tasks including naturalistic contexts such as social dance. We use mainly MATLAB, Python, R, SPSS, and other more specific quantitative data analysis and task presentation software

The exact scientific question of the MSc project and data modality will be decided with the student to ensure it will fit their skills, interests and aspirations. All projects will entail:

- Pre-processing and statistical analysis of psychophysiological data, such as: electroencephalography, functional magnetic resonance imaging, eye-tracking, pupilometry, skin conductance response, genetic data and/or electrocardiography –collected mostly in current randomised controlled drug studies of the lab.
- Literature search, hypotheses design, and scientific paper co-writing (possibly worth paper co-authorship) on the above analysis.
- Participate in weekly joint lab meetings (approx 10 individuals present, of mixed nationalities, Bsc/MSc/PhD students with diverse backgrounds: in engineering, data science, psychology, biology, pharmacology, anthropology and medicine).

3-5 recent publications :

Examples are below, but all publications available in:
https://dpratalab.wordpress.com/papers/

Rodrigues A, Castro Santos H, Ferreira S, Diogo V, Costa M, Brissos S, Gama Marques J, **PRATA D.** An exploration of blood-based biomarkers of negative symptoms of psychosis in men. ***Journal of Psychiatric Research.*** 2024. DOI: https://doi.org/10.1016/j.jpsychires.2024.06.050

Santiago A*, Kosilo M*, Cogoni C, Diogo V, Jerónimo R, **PRATA D.** Oxytocin modulates neural activity during early perceptual salience attribution. ***Psychoneuroendocrinology.*** 2024. DOI: 10.1016/j.psyneuen.2023.106950 **Equal contribution.*

Cosme G, Arriaga P, Rosa PJ, Mehta M, **PRATA D.** Temporal profile of intranasal oxytocin in the human autonomic nervous system at rest: an electrocardiography and pupillometry study. ***Journal of Psychopharmacology.*** *2023. 2698811231158233. doi:10.1177/02698811231158233*

Kosilo M, Costa M, Nuttall H, Ferreira H, Scott S, Meneres S, Pestana J, Jerónimo R, **PRATA D**. The neural basis of authenticity recognition in laughter and crying. ***Scientific Reports (Nature Research).*** 2021. 11 (1), 1-13.