MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2025-2026

(internship from January to June 2025)

Host laboratory: *Name + address*
Institut des Sciences Cognitives, 67 bd Pinel, 69675 BRON

Host team : *team name + website*
Team Jean-Claude Dreher
https://dreherteam.wixsite.com/neuroeconomics

Internship supervisors : *name + position + email*
Jean-Claude Dreher : dreher@isc.cnrs.fr

Project title : Diffusion of information in social networks

Project summary : *approx 10 lines*
Many social phenomena emerge from network interactions between individuals. This type of phenomenon includes collective decision-making, opinion formation, the propagation of 'fake news', the polarization of opinion groups and echo chamber effect. This project lies at the intersections between social neuroscience, decision neuroscience and social network modeling. It will allow us the identification of the neurocomputational mechanisms engaged in learning from others. Its main goals are:
- To conduct behavioral experiments in networks where each participant has access to private information that can be acquired personally and/or to information obtained by observing other people within a social network;
- To determine the neurocomputational mechanisms requited to integrate information from information propagating in social networks, using model-based fMRI.
Together, this project aims to determine how we integrate our own beliefs about the veracity of information and the beliefs of others in the social network. It should establish a mechanistic foundation for understanding the computations underlying decisions to integrate, learn and send information in social networks, to bridge the gap between the levels of individual and collective behavior.

3-5 recent publications :

- P Lockwood, W. Van Den Bos, J-C Dreher, Moral learning and decision-making across the lifespan, *Annual Review of Psychology*, https://doi.org/10.1146/annurev-psych-021324-060611, 2025 (https://osf.io/preprints/psyarxiv/b5xf7)

- C Qu, Y Huang, R Philippe, S Cai, E Derrington, F Moisan, M Shi, and J-C Dreher. Causal Role of the Medial Prefrontal Cortex in Learning Social Hierarchy, *Communications Biology*, 7:304, (2024), DOI:10.1038/s42003-024-05976-2

- R. Philippe, R. Janet, K Khalvati, R.P.N. Rao, D Lee, JC. Dreher, Neurocomputational mechanisms engaged in detecting cooperative and competitive intentions of others, DOI: 10.21203/rs.3.rs-1160167/v1, *Nature Communications*, 2024

- K Khalvati, S A. Park, R Philippe, M Sestito, **J-C Dreher***, and Rajesh P. N. Rao*. Bayesian Inference of Other Minds Explains Human Decisions in a Group Decision Making Task, *Science Advances,* Vol. 5, no. 11, eaax8783, DOI: 10.1126/sciadv.aax8783 *: co-last author (contributed equally), 2019

- S.A. Park, M Sestito, E D. Boorman and **J-C Dreher**. Neural computations underlying strategic social decision-making in groups, *Nature Communications*, 10:5287, 2019