

## MASTER 2 Fundamental and Clinical Neurosciences

### Internship proposal 2026-2027

(internship from January to June 2027)

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

**Host team :**

**Team Jean-Claude Dreher**

<https://dreherteam.wixsite.com/neuroeconomics>

**Internship supervisors :** Jean-Claude Dreher, research director at CNRS, [dreher@isc.cnrs.fr](mailto:dreher@isc.cnrs.fr)

**Project title :** Dynamic brain-to-brain coupling during cooperation and competition

#### **Project summary :** *approx 10 lines*

Dyadic social interactions often require individuals to continuously infer others' intentions and flexibly adjust one's behavior. However, the computational and inter-brain mechanisms supporting such dynamic adaptation remain unclear. Here, we plan to combine hyperscanning functional near-infrared spectroscopy (fNIRS) with computational modeling to investigate interactions between dyads engaged in interactions that can be cooperative or competitive, but which are not signaled (see Philippe et al., 2024). This study should demonstrate that adaptive social behavior is supported by multiscale brain-to-brain coupling shaped by computational mechanisms previously identified by our team, revealing how neural dynamics scaffold flexible shifts between cooperation and competition.

#### **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