

MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2025-2026

(internship from January to June 2026)

Host laboratory: Institut des Sciences Cognitives, UMR 5229 CNRS/UCBL, 67 Bd Pinel, 69675 Bron, France (<http://isc.cnrs.fr>)

Host team : Decision, Action, and Neural Computation (DANC) team
(<https://www.danclab.com/>)

Internship supervisors :

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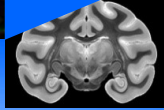
Project title : Relationship between beta bursts and emerging motor skills across the first year of life

Project summary :

Increasingly, research shows that neural activity in the sensorimotor beta band occurs in transient bursts of activity rather than oscillations. Beta bursts likely play a critical role in regulating motor function, ranging from movement preparation to execution and inhibition, but so far, little is known about their function. Examining beta bursts in developmental populations is critical for clarifying this, especially across the first year of life as this is marked by rapid and significant changes in perceptual and motor abilities, and is a sensitive period of brain development. The internship will be part of a larger project examining the development of beta bursts in early infancy. The project involves longitudinally assessing infants using EEG, questionnaires, and behavioral observation at 3, 6, and 12 months of age. The internship project will include the behavioural coding of video recordings of infants interacting with objects, and analyses linking this to the EEG data.

3-5 recent publications:

Szul, M. J., Papadopoulos, S., Alavizadeh, S., Daligaut, S., Schwartz, D., Mattout, J., & Bonaiuto, J. J. (2023). Diverse beta burst waveform motifs characterize movement-related cortical dynamics. *Progress in neurobiology*, 228, 102490.



Rayson, H., Szul, M. J., El-Khoueiry, P., Debnath, R., Gautier-Martins, M., Ferrari, P. F., ... & Bonaiuto, J. J. (2023). Bursting with potential: how sensorimotor beta bursts develop from infancy to adulthood. *Journal of Neuroscience*, 43(49), 8487-8503.

Rayson, H., Debnath, R., Alavizadeh, S., Fox, N., Ferrari, P. F., & Bonaiuto, J. J. (2022). Detection and analysis of cortical beta bursts in developmental EEG data. *Developmental cognitive neuroscience*, 54, 101069.