

## **MASTER 2 Fundamental and Clinical Neurosciences**

### **Internship proposal 2023-2024**

*(internship from January to June 2024)*

**Host laboratory:** *Lyon Neuroscience Research Center – Lyon 1 / Inserm U1028/ CNRS UMR5292*

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**Host team :** *IMPACT - <https://www.crnl.fr/fr/equipe/impact>*

**Internship supervisors :** *David Thura, Inserm CRCN – [david.thura@inserm.fr](mailto:david.thura@inserm.fr)  
([davidthura.com](http://davidthura.com))*

**Project title :** **The role of the sensorimotor spiking activities and oscillations in the coordination of decision and action during foraging.**

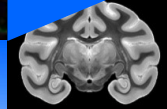
#### **Project summary :**

The mechanisms of reward optimization in decision-making have generally been studied separately from those in movement control. However, during natural behavior, animals are often faced with decisions about actions, and the time they invest in deciding and acting must be optimized together rather than separately to ensure an adapted rate of reward. This implies that the control of decisions and actions share common principles, and perhaps involve overlapping neural circuits.

Non-human primates have been trained to execute a simple reaching-based foraging task during which reward rates and motor costs are varied between and/or within blocks of trials. Isolated neurons and local field potentials have been collected in the animal's dorsal premotor cortex and in the striatum during numerous sessions of foraging. While the analysis of single-neuron activity indicates a role of the premotor cortex in the coordination of the exploitation duration with the exploration vigor, the role of cortical oscillations, striatal activity and cortico-striatal connections still need to be determined.

The project will analyze spiking activities and local field potentials collected in the premotor cortex and striatum of non-human primates performing a foraging task to shed light on the role of the cortex-striatal network in the coordination of decision making with motor control.

Please send your proposal to [marion.richard@univ-lyon1.fr](mailto:marion.richard@univ-lyon1.fr) for publication on the Master of Neuroscience website.



### 3-5 recent publications :

Saleri Lunazzi C, Thura D, Reynaud AJ. Impact of decision and action outcomes on subsequent decision and action behaviours in humans. Eur J Neurosci. 2023 Feb 8. doi: 10.1111/ejn.15932.

Thura D, Cabana JF, Feghaly A, Cisek P. Integrated neural dynamics of sensorimotor decisions and actions. PLoS Biol. 2022 Dec 15;20(12):e3001861. doi: 10.1371/journal.pbio.3001861.

Derosiere G, Thura D, Cisek P, Duque J. Hasty sensorimotor decisions rely on an overlap of broad and selective changes in motor activity. PLoS Biol. 2022 Apr 7;20(4):e3001598. doi: 10.1371/journal.pbio.3001598.

Cisek P, Thura D. Models of decision-making over time. The Oxford Research Encyclopedia of Neuroscience. Retrieved 7 Sep. 2022, from <https://oxfordre.com/neuroscience/view/10.1093/acrefore/9780190264086.001.0001/acrefore-9780190264086-e-346>

Saleri Lunazzi C, Reynaud AJ, Thura D. Dissociating the Impact of Movement Time and Energy Costs on Decision-Making and Action Initiation in Humans. Front Hum Neurosci. 2021 Nov 1;15:715212. doi: 10.3389/fnhum.2021.715212.