

MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2022-2023

(internship from January to June 2023)

Host laboratory:

Centre de Recherche en Neurosciences de Lyon (CRNL)
Centre Hospitalier Le Vinatier – Bâtiment 462- Neurocampus Michel Jouvét
95 Boulevard Pinel
69675 BRON Cedex

Host team:

CMO Team. <https://www.crnl.fr/fr/equipe/cmo>

Internship supervisor:

Alexandra Veyrac, Chargée de Recherche, alexandra.veyrac@cnrs.fr, <https://www.crnl.fr/en/user/89>
In close collaboration with Nathalie Buonviso and the group of the team working on the physiology of the respiration.

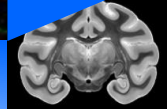
Project title:

Role of the emotional processing in the formation and consolidation of remote episodic memories in rats

Project summary:

The mechanisms involved in the **storage of old non-traumatic episodic memories** are not known. Understanding why and how these memories at the heart of individual histories are stored, is an important issue for **understanding normal and pathological brain function**. Memory of life episodes is formed incidentally and occasionally by the association of several information (What? Where? When/In which context?) that recruits a **large brain network** to form a **single engram** which evolves over time. In the team, we have developed a **new behavioral task** that allows rats to form episodic memories from contextual, spatial and olfactory information. We show that the quality of the remote episodic memory differs across rats and depends on the negative odor-related experience during the first episode. Interestingly, we show that the recall of a complete episodic memory is associated with a higher activity in brain **areas involved in the emotional processing** of the information, especially **olfactory regions**. The aim of the internship will be to analyze the **impact of individual emotional variables** observed during the episodes on the storage of a complete remote episodic memory. The rats will be equipped, throughout the experiment, with a **new connected vest** (ETISENSE) allowing the recording of **cardiac and respiratory variables** and their **correlation with remote memory performance**. This project will also open **new perspectives** on the **behavioral and cerebral determinants** that anchor complex memories in our long-term memory systems and on **their possible manipulation** to influence their fate.

Please send your proposal to marion.richard@univ-lyon1.fr for publication on the Master of Neuroscience website.



3-5 recent publications:

- Veyrac A**, Allerborn M, Gros A, Michon F, Raguet L, Kenney J, Godinot F, Thevenet M, Garcia S, Messaoudi B, Laroche S and Ravel N. (2015) Memory of occasional events in rats: individual episodic memory profiles, flexibility, and neural substrate. *The Journal of Neuroscience* 35:7575-7586.
- Gros A, **Veyrac A** and Laroche S. (2015) Brain and memory: new neurons to remember. *Biologie aujourd'hui* 209:229-248.
- Lefèvre L, Courtiol E, Garcia S, Messaoudi B, **Buonviso N**. (2016) Significance of sniffing pattern during the acquisition of an olfactory discrimination task. *Behavioral Brain Research* 312:341-54.
- Girin B, Juventin M, Garcia S, Lefèvre L, Amat C, Fourcaud-Trocmé N, **Buonviso N**. (2021) The deep and slow breathing characterizing rest favors brain respiratory-drive. *Scientific Reports* 11(1): 7044.
- Auguste A, Fourcaud-Trocmé N, Meunier N, Garcia S, Messaoudi B, Thevenet M, Ravel N, **Veyrac A**. Distinct brain networks for remote episodic memory depending on content and emotional value. *Submitted Nature Communication*.
- Gros A, Auguste A, Garcia S, Messaoudi B, Thevenet M, Ravel N, **Veyrac A**. Boosting remote episodic memory in rats: Memory reactivation *versus* memory-modulating event. *In preparation*.