



MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2024-2025

(internship from January to June 2025)

Host laboratory: Centre de Recherche en Neurosciences de Lyon (CRNL)

Host team : SLEEP team (<https://www.crnl.fr/fr/equipe/sleep>)

Internship supervisors : Mattia Aime, CNRS FRM Junior Researcher, SLEEP team, aime.mattia@gmail.com
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Project title : All-optical interrogation of emotional memories during sleep

Project summary : *approx 10 lines*

Rapid eye movement (REM) sleep is a critical stage of the sleep cycle, characterized by vivid dreams and high emotional content. Over the years, researchers have been intrigued by the relationship between REM sleep and emotions. Studies have demonstrated that REM sleep is crucial for emotional processing, memory consolidation, and regulation of mood. In this context, the amygdala, a brain region associated with emotional processing, is highly active during REM sleep. Abnormalities in amygdala physiology during REM sleep have been linked to several psychiatric disorders, such as depression, anxiety, and post-traumatic stress disorder (PTSD). The primary objective of this project is to investigate the circuit-level mechanisms that underlie emotional processing during sleep and identify the pathological mechanisms that contribute to the development of affective disorders.

3-5 recent publications :

- 1- Aime M. To “feel” better, sleep on it. *Science*. 2023
- 2- Aime M, Calcini N, Borsa M, Campelo T, Rusterholz T, Sattin A, Fellin T, Adamantidis A. Paradoxical somatodendritic decoupling supports cortical plasticity during REM sleep. *Science*. 2022
- 3- Aime M, Augusto E, Kouskoff V, Campelo T, Martin C, Humeau Y, Chenouard N, Gambino F. The integration of Gaussian noise by long-range amygdala inputs in frontal circuit promotes fear learning in mice. *Elife*. 2020