

Internship Opportunity in Neuroscience Research

Donders Centre for Neuroscience, Nijmegen

We are offering an internship for Master students in neuroscience interested in exploring the neurophysiological correlates of memory consolidation.

Project Overview

According to the central dogma of memory theory, memories are initially stored as links between patterns of Hippocampal (HC) activity, called “Index code” and distributed neocortical (NC) activity containing memory attributes.

To effectively extract the gist of recent memories without disrupting existing ones, the brain engages in interleaved offline reactivation of recent experiences alongside previously stored data. Research suggests that during the consolidation process, occurring notably during Slow-Wave-Sleep, there are significant structural connectivity changes in both Neocortex and Hippocampus, coinciding with reactivation in these regions.

We developed a novel behavioural memory task in Virtual Reality (VR) designed for mice. This setup enables precise monitoring of both remote and recent memory responses, offering a unique opportunity to explore the dynamics of memory consolidation.

This project aims to provide insights into the mechanisms underlying memory consolidation. By strategically manipulating neural activities, we aim to investigate how these interventions impact both remote and recent memories, particularly focusing on the interplay between their respective patterns during sleep stages.

What You Will Do

As an intern on this project, you will have the opportunity to:

- **Surgeries:** practice and observe surgical procedures.
- **Behavioural Training:** participate in experiments involving mice to study learning and memory.
- **Histology:** Gain experience in tissue preparation and analysis to examine brain structures.
- **Electrophysiology:** learn and assist with neural recordings and manipulation.
- **Data Analysis:** Work with data collected from imaging and behavioural experiments using Python.

Who Should Apply

- Master students in neuroscience or related fields
- Students interested in neural circuits, learning, and memory
- Basic laboratory experience is a plus, but not required
- Basic coding knowledge is a plus, but not required

How to Apply

If you're interested in this internship, please send your CV and a brief motivation letter to Francesco Battaglia (francesco.battaglia@donders.ru.nl) or Angela Zordan (angela.zordan@donders.ru.nl)