

MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2026-2027

(internship from January to June 2027)

Host laboratory:

Laboratoire de Neurophotonique (Matthieu Vanni)

Université de Montréal

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Host team :

Matthieu Vanni

<https://opto.umontreal.ca/ecole/equipe/corps-professoral/fiche/in/in30374/sg/Matthieu%20Vanni/>
<https://www.labvanni.com/>

Internship supervisors :

Matthieu Vanni

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Project title :

Multimodal cortical plasticity and sensorimotor integration in visual cortex

Project summary : *approx 10 lines*

This project investigates how cortical circuits reorganize following sensory loss or brain lesions, with a particular focus on primary visual cortex (V1). A central objective is to understand how visual and motor signals interact in V1 and how these interactions are reshaped after vision loss.

The project also explores intermodal plasticity following cortical lesions (e.g., stroke), and how spared sensory and motor circuits contribute to functional compensation.

Experiments are conducted in mouse models and combine in vivo approaches such as wide-field and two-photon calcium imaging, electrophysiology, optogenetics, and quantitative behavioral analysis.

Depending on the student's background, the internship may involve experimental work (animal handling, imaging, behavior) and/or quantitative data analysis.

The project is part of a broader research program at the interface of systems neuroscience, imaging, and quantitative analysis.

3-5 recent publications :

<https://pubmed.ncbi.nlm.nih.gov/41641448/>

<https://pubmed.ncbi.nlm.nih.gov/37582847/>

<https://pubmed.ncbi.nlm.nih.gov/40860897/>