Master's degree in Biology – Chemistry-Biology Department

Master 2 internship project
Year 2026-2027

Laboratory/Institute: Grenoble Institut Neurosciences - GIN **Director:** E. Barbier
Team: Neurocytoskeleton Dynamics and Structure **Head of the team:** I. Arnal

Name and status of the scientist in charge of the project: Sylvie Gory, CR Inserm

HDR: yes x no ☐

Address: bâtiment Edmond J. Safra, chemin Fortuné Ferrini, 38700 La Tronche, France
Phone: 04 56 52 05 65 **e-mail:** sylvie.gory-faure@univ-grenoble-alpes.fr

Program of the Master's degree in Biology:

☐ Microbiology, Infectious Diseases and Immunology ☐ Biochemistry & Structure
☐ Physiology, Epigenetics, Differentiation, Cancer **x Neurosciences and Neurobiology**

Title of the project:

MAP6d1 expression characterization in the brain

Objectives (up to 3 lines):

Precise MAP6d1 localization at different levels: 1/ in different brain region – 2/ subcellular localization in neurons and oligodendrocytes – 2/ in organization of neuronal primary cilia

Abstract (up to 10 lines):

Neurons rely on the microtubule cytoskeleton to establish and maintain their highly polarized architecture while adapting their connectivity and responsiveness to incoming signals. This regulation is partly mediated by microtubule-associated proteins such as MAP6d1. MAP6d1 is expressed postnatally in the brain and acts as a major microtubule stabilizer ; we have recently shown that it regulates microtubule doublet assembly in neuronal primary cilia. Our ongoing work reveals that MAP6d1-knockout mice exhibit altered emotional behavior, a phenotype potentially linked to MAPd1's role in serotonin signaling via its interaction with 5HT2B receptors. The next critical step in deciphering MAP6d1's neuronal functions is to precisely map its localization in the brain at different developmental stages and assess its subcellular distribution in neuronal compartments. To achieve this goal, we generated MAP6d1-knockin GFP mice, in which the endogenous MAP6d1 is fused to a fluorescent GFP tag, allowing direct in vivo visualization of its expression. The objective of the Master 2 internship will be to characterize this new mouse line by histological analysis of brain sections and cell biology studies using primary cultures of hippocampal neurons.

Methods (up to 3 lines):

Werstern blot, histology (cryostat section and immunofluorescence on floating slices), cell biology (primary neuronal culture dans immunofluorescence), confocal microcopy, expansion microscopy

Up to 3 relevant publications of the team:

Gopal D., Wu J., et al, Nat. Commun. 2025

Boulan B., Ravanello C., et al., ELife 2021

Gory-Fauré et al., Methods Mol Biol 2022

Requested domains of expertise (up to 5 keywords):

Cell biology and/or histology