

**Master 2 internship project
Year 2023-2024**

Laboratory/Institute: Grenoble Institut Neurosciences - GIN

Director: E. Barbier

Team: From development to repair

Head of the team: H. Nawabi

Name and status of the scientist in charge of the project: H. Nawabi, CRCN Inserm

HDR: yes no

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Program of the Master's degree in Biology:

- Microbiology, Infectious Diseases and Immunology Structural Biology of Pathogens
 Physiology, Epigenetics, Differentiation, Cancer Neurosciences and Neurobiology

Title of the project: Promoting specific brain nuclei innervation

Objectives (up to 3 lines):

Our lab is interested in neuronal circuit formation. Our project uses in vivo and in vitro approaches to decipher molecular and cellular mechanisms of axon guidance and circuit formation using the mouse visual system.

Abstract (up to 10 lines):

During embryonic development, thousands of axons navigate through long distances to reach their targets and form functional circuit. To do so, they interact, along their path, with guidance cues give them topographic information. One of the best models to study such mechanisms is the mouse visual system. In the retina, only retina ganglions cells (RGC) project their axons to form the optic nerve, the only bridge between the eye and the brain. These axons project to at least 30 brain regions to transit visual information. We will focus on a particular brain nucleus and study its innervation during development. Understanding these mechanisms are critical for our understanding of circuit formation during development but also when it comes to repair the mature nervous system. Indeed, when axons are injured, the related neuronal circuits are disrupted and need to be built again.

Methods (up to 3 lines):

Methods developed in the team are: histology (cryostat sectioning, immunostaining, in situ hybridization), primary neuron culture, western-blot analysis, microscopy, images analysis.

Up to 3 relevant publications of the team:

1- [Schaeffer J](#), [Vilallongue N](#), [Blot B](#), [El Bakdouri N](#), [Decourt C](#), [Plissonnier E](#), [Excoffier B](#), [Paccard A](#), [Diaz JJ](#), [Humbert S](#), [Catez F](#), [Saudou F](#), [Nawabi H*](#), [Belin S*](#). Customization of translational complex regulates mRNA-specific translation to control CNS regeneration. *In press in Neuron* * co-last

2- [Vilallongue N](#), [Schaeffer J](#), [Hesse AM](#), [Delpech C](#), [Paccard A](#), [Couté Y](#), [Belin S](#), [Nawabi H](#). Axon guidance modalities in CNS regeneration revealed by quantitative proteomic analysis. **Nature Communications 2022**

3- [Schaeffer J*](#), [Delpech C*](#), [Albert F](#), [Belin S](#), [Nawabi H](#). Adult mouse retina explants: an ex vivo window to explore central nervous system diseases. **Frontiers in Molecular Neuroscience 2020**

Requested domains of expertise (up to 5 keywords):

Neurology, molecular and cellular biology, histology, imaging