Institut de Génétique Moléculaire de Montpellier
IGMM / CNRS – Université de Montpellier
1919 Route de Mende, 34293 Montpellier Cedex 05

2027 Internship Offer

Master 1: YES– Duration: 6 months **Master 2**: YES– Duration: 6 months

Team, Contact	Lucas Alonso, lucas.alonso@igmm.cnrs.fr Florence Rage, florence.rage@igmm.cnrs.fr
Title	Decoding Neuronal Network Dysfunction and Extracellular Vesicle Signatures in Primary Lateral Sclerosis
Research Themes and questions	This research project aims to model corticospinal junctions using induced pluripotent stem cell (iPSC) lines derived from patients with Primary Lateral Sclerosis (PLS). The objective is to identify and characterize functional impairments through electrophysiological recordings, investigate molecular alterations via axonal transcriptomics, and profile extracellular vesicle (EV) communication. Ultimately, the project seeks to uncover potential therapeutic targets and improve our understanding of disease mechanisms.
Methods and experimental approaches	- cell culture of hIPSC and derived neuronal differentiation on microfluidic devices - MEA recording - Molecular biology: QPCR, RNA extraction… - EV Purification - Immunofluorescence
2-3 Publications	1. Duc P, Vignes M, Hugon G, Sebban A, Carnac G, Malyshev E, Charlot B, Rage F. Human neuromuscular junction on micro-structured microfluidic devices implemented with a custom micro electrode array (MEA). Lab Chip. 2021 :4223-4236. 2. Ozdinler, P.H., Gautam, M., Gozutok, O., Konrad, C., Manfredi, G., Gomez, E.A., Mitsumoto, H., Erb, M.L., Tian, Z., and Haase, G. (2020). Better understanding the neurobiology of primary lateral sclerosis. Amyotroph Lateral Scler Frontotemporal Degener 21, 35–46. https://doi.org/10.1080/21678421.2020.1837175. 3. Ho, R., Sances, S., Gowing, G., Amoroso, M.W., O'Rourke, J.G., Sahabian, A., Wichterle, H., Baloh, R.H., Sareen, D., and Svendsen, C.N. (2016). ALS disrupts spinal motor neuron maturation and aging pathways within gene co-expression networks. Nat Neurosci 19, 1256–1267. https://doi.org/10.1038/nn.4345.