Master de Sciences et Technologies
Mention Biologie Intégrative et Physiologie
Parcours : Neurosciences
Responsable : Professeur Régis Lambert

Internship Proposal
Academic Year 2019-2020

1. Host team :

Research Unit (e.g. Department or Institute) : Centre de recherche en myologie
Research Unit Director : Pr Fontaine
Research Team Director : Pr Fontaine / Dr Strochlic
Team name : Equipe 10 NMCONNECT

Address : Centre de Recherche en Myologie
UMRS974–SU-INSERM–AIM–GHPS
105, Boulevard de l'Hôpital, 3ème étage
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Supervisor of the Research Intern for this project : Gaelle BRUNETEAU
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2. Internship project title:

Muscle and systemic factors influencing neuromuscular reinnervation in ALS

3. Internship Description :

Amyotrophic lateral sclerosis (ALS), is a rapidly progressive neurodegenerative disorder, usually leading to death from respiratory failure in 3-5 years. In ALS, loss of functional motor neurons is initially compensated for by collateral reinnervation and strength is preserved. In the majority of ALS patients, as the disease progresses, compensation fails leading to progressive muscle weakness. Conversely, in long-term ALS survivors, slow functional decline is correlated with their ability to maintain a successful compensatory response to denervation over time. Our goal is to determine the molecular mechanisms involved in the maintenance of collateral reinnervation and muscle function in ALS patients, to help identify new therapeutic targets. To analyze the reinnervation process in human subjects, we use muscle biopsy specimens obtained in the motor point region and utilize immunohistochemical and fluorescent stainings to analyze the morphology of neuromuscular junctions.

We wish to host an M2 student in the team for the 2019-2020 academic year. This internship will focus on investigating the contribution of insulin signaling pathways in the maintenance of muscle reinnervation and motor function in patients with ALS. The student will analyze muscle biopsies obtained from ALS patients and healthy subjects. He/she will perform morphological analysis of neuromuscular junctions and quantification of innervation by confocal microscopy. The level of activation of insulin main signaling pathways will be determined using molecular biology technics. Innervation quantification results will be analyzed together with clinical assessment of motor function, electrophysiological data and skeletal muscle and whole-body metabolic parameters. The student will receive training in the experimental procedures and in data analysis.