Internship offer
M2 Musculo-Skeletal system, Locomotion, Exercise (MuSkLE)

Title of the Internship: Role of TRPV1 channels in Skeletal Muscle Hypoxia-Response

Laboratory (name, n°, website): CarMeN Lab, INSERM U1060, https://carmen.univ-lyon1.fr/en/

Research team (name, website): IRIS Team- Ischemia-Reperfusion Injury Syndrome, https://carmen.univ-lyon1.fr/en/teams/team-iris/

Supervisor to contact (name, email address): DUCREUX Sylvie, sylvie.ducreux@univ-lyon1.fr

Project description including a short introduction, aim/objectives and methods/approach to be used

Skeletal muscle is frequently exposed to hypoxic conditions, particularly during intense exercise or in various pathological contexts, leading to significant metabolic changes, including intracellular acidification and increased reactive oxygen species production. TRPV1 (Transient Receptor Potential Vanilloid 1) is a non-selective cation channel characterized by a high permeability to Ca^{2+} ions and a broad tissue distribution. Although it has been extensively studied, its precise role in skeletal muscle remains poorly understood. Given its sensitivity to metabolic stress signals, TRPV1 may act as a key sensor linking hypoxia-induced changes to cellular responses.

The aim of this Master's project is to investigate the role of TRPV1 as a potential metabolic sensor of hypoxia in skeletal muscle cells. The study will be carried out using *in vitro* models (cultured human muscle cells and HEK293T cells) exposed to controlled hypoxic conditions. The project will focus on characterizing TRPV1 expression and activity under hypoxia and evaluating its impact on key cellular processes, including intracellular calcium signaling, oxidative stress, and major metabolic pathways.

This internship will provide the student with hands-on experience in cell culture, biochemical techniques, and Ca^{2+} imaging approaches. More broadly, it offers an opportunity to work at the interface of muscle physiology, metabolism, and cell signaling within a dynamic research environment.

References: https://doi.org/10.1371/journal.pone.0058673; https://doi.org/10.1007/s12576-011-0185-4; https://doi.org/10.3390/cells12182322; https://doi.org/10.1186/s13102-025-01523-6

Skills required: We are seeking a motivated student with a background in physiology or cell biology. Skills in biochemistry, statistics, and calcium imaging are also highly valued.