

# Function of skeletal muscle triads

## Funded PhD project for Engineer or Master students

### Project:

Skeletal muscle triads are key cellular membrane structures for the coupling between neuronal excitation and muscle contraction. Accordingly, several triad proteins are mutated in severe muscle genetic diseases. Neuronal action potentials activate protein channels at triads, leading to intracellular calcium release and muscle contraction. Besides this function, triads have been barely studied. The PhD project will address the following questions: 1) What is the composition of triads in different physiological or pathological situations? 2) How do triads adapt to acute muscular demand (physical exercise, sugar intake)? 3) What are the other functions of these triads? To answer these questions, the PhD student will use a new cutting-edge comparative spatio-temporal proteomic analysis method coupling proximity biotinylation and mass spectrometry: BioID. The functions of the proteins identified by this study will then be analyzed *in vivo* and *in culture* in tissues and muscle cells deleted from the corresponding genes using CRISPR-Cas9 technology. The impact of the absence of these proteins on muscle function will be determined by biochemical, cellular and physiological approaches including high-resolution imaging. The PhD project will therefore expand knowledge on a structure essential to the proper functioning of skeletal muscles and its role in physiological and pathological conditions.

**Keywords:** skeletal muscles, exercise, cellular biology, proteomics, imaging

### Candidate profile:

You are a highly motivated student (Engineer final year or Master 2), with strong interest in cellular mechanisms and *in vivo* studies and a proven expertise in cellular biology or physiology. An interest for bioinformatics data mining is a plus.

### Location:

The internship will take place in Grenoble at the GIN (Grenoble Institute of Neurosciences) that offers a unique environment with 250 persons from different nationalities and state-of-the-art scientific platforms. Grenoble is a dynamic city mixing science and outdoors activities with high-tech centers and the close proximity of picturesque mountains of the Alps.

### Application:

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