

PhD position offer

EUR CBS 2024-2025

University Grenoble Alpes

Project title	Muscle methylation and metabolism dynamics - M³ Dynamics
Keywords	Muscle stem cells ; protein methylation; metabolism; epigenetics
Project leader	Nicolas Reynoird – IAB (Protein methylation dynamics)
Project co-leader	Uwe Schlattner – LBFA
Application deadline	May 30th 2025

Project

The expression of a specific molecular program ruling the right process of muscle stem cells (MuSC) fate is required for regenerative myogenesis and skeletal muscle homeostasis. Muscle pathologies generally originate or result from altered MuSC fate, such as muscle wasting in aging, muscular dystrophy or rhabdomyosarcoma. Covalent post-translational protein modifications (PTMs) such as lysine methylation contribute to all aspects of cell physiology and are a primary source of protein functional diversity in mammalian cells, including muscle biology.

Our preliminary data suggest that a lysine methyltransferase participates in muscle homeostasis through epigenetic and metabolic signaling. MuSC maintenance and differentiation are controlled by gene expression programs regulated by intertwined epigenetic and metabolic mechanisms and our working hypothesis is that this methyltransferase is a key actor of MuSC fate trajectory by regulating critical epigenetic and metabolic rewiring.

To decipher its functions in muscle biology and to understand how deregulation of its signaling might alter skeletal muscle homeostasis and promote human diseases, the PhD candidate will unravel related phenotypes and biological functions of the methyltransferase in MuSC and relevant mouse model. She/he will identify the specific substrates and partners of the methyltransferase through unbiased proteomics approaches and functionally characterize the most relevant pathways at play, with a particular focus on epigenetic- and metabolic-related functions.

We expect to identify and characterize key relevant protein methylation signaling pathways to provide better insights into muscle biology and therapeutic opportunities for related pathologies of muscle origin.

Candidate

We are looking for a highly motivated candidate with good theoretical and technical skills in molecular and cell biology. The candidate should be enthusiast for the project and the general field of research and is expected to have hand-on experience in at least epigenetics, cell signaling or metabolism. French speaking is not required.

Contact

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Applications should include a motivation letter, CV, University grades/ranking and reference letters.