



i2MC
Institut des Maladies
Métaboliques et Cardiovasculaires



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UNIVERSITÉ
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Funded doctoral (PhD) position at the Institute of Metabolic and Cardiovascular Diseases, Toulouse, France
Prof. Dominique Langin and Dr. Emilie Montastier at I2MC are seeking application for a doctoral position related to the European Research Council-funded SPHERES project. The position is opened from October 2021 (3-year contract).

About SPHERES (Lipid droplet hypertrophy: the link between adipocyte dysfunction and cardiometabolic diseases)

The goal of SPHERES is to understand the dynamics and consequences of adipocyte hypertrophy through investigation of its large lipid droplet (LD). SPHERES PIs (Langin at Toulouse III University, Rydén at Karolinska Institutet, Antonny at CNRS) postulate that disturbances in the interactions between LD proteins and LD lipid composition lead to adipocyte hypertrophy and its deleterious consequences. Spanning from molecular, cellular to the whole-body level, SPHERES will link new knowledge on the formation and maintenance of large adipocyte LDs to the deleterious impact of adipocyte hypertrophy.

Duties *Enzymatic and non enzymatic roles of key proteins of the adipocyte lipid droplet*

Adipocyte LDs are unique in terms of size and metabolism. The LD surface is constituted by a lipid monolayer with specific LD-coating proteins. The core of fat cell LDs is mainly composed of triglycerides (TGs). Some adipocyte LD-associated proteins are essential for LD formation, maintenance and degradation. The PhD project will focus on two proteins involved in TG degradation (*Nat Rev Endocrinol*, 2021, 17, 276-295). Hormone-sensitive lipase (HSL) is an enzyme involved in the hydrolysis of TGs into fatty acids, a catabolic process named adipose tissue lipolysis (*Prog Lipid Res*, 2020, 82, 101084). Perilipin 1 (PLIN1) is a LD-coating protein interacting with HSL and preventing action of the lipase. HSL and PLIN1 are suspected to exert non enzymatic actions (*Nat Metab*, 2019, 1, 133-146 and unpublished data). The PhD project therefore aims at dissecting enzymatic and non enzymatic roles of HSL and PLIN1. Novel models of human and mouse adipocytes are being generated to invalidate or replace endogenous genes by mutant versions. These models will be used to study protein-protein interactions and adipocyte metabolism (*Am J Physiol Cell Physiol* 2021, online). Pathophysiological relevance will be provided from ongoing clinical protocols and biobanks of human adipose tissue samples.

Entry requirements

The applicant must hold master degree (M2R or equivalent). Candidates must have a strong training and knowledge in mammalian cell culture, protein biochemistry and related molecular techniques. Experience on metabolism and mouse models will be considered.

B2 (upper-intermediate) levels in the French and English languages are required. The candidate needs excellent communication and organizational skills and be motivated by collaborative work with colleagues at I2MC and ERC collaborators.

Application process

The application must contain the following documents in English: 1. Curriculum vitae incl. ranking at various university levels and, if relevant, list of publications/communications, 2. Summary of research experience (no more than one page), and 3. Contact details for two referees

Please, send application files to: dominique.langin@inserm.fr

Selection process

A first round of selection will be performed based on documents sent by the candidates.

Selected candidates will be interviewed by the PhD supervisors (Prof. Langin and Dr. Montastier).

About the Institute of Metabolic and Cardiovascular Diseases (I2MC)

I2MC is one of the largest Research Centre in metabolic and cardiovascular diseases in Europe with 15 laboratories and a work force of about 280. Basic scientists and clinicians are working on metabolic risk factors (obesity, diabetes and dyslipidemia) and their cardiovascular complications (thrombosis, atherosclerosis, cardiac and renal failure). The expertise combines cell biology, mouse models and clinical work supported by facilities in lipidomics, genomics, proteomics, animal phenotyping and cell imaging.

About Toulouse

Toulouse is located in Southwestern France close to the Pyrenees Mountains and Spain with flight and train connections to many French and European cities. With more than 100,000 students and praised quality of life, it is regularly ranked as one of the best places to live and study in France.