MuSkLE PhD programme
Building, maintaining and repairing the functional locomotor system

Co-funded by the European Union

PhD Position 13 job vacancy

Reference:	**PP13**
Title:	Targeting neuroinflammation to combat cancer cachexia - Mechanisms and therapeutic strategy
Hiring institution:	**UJM**
Location:	Jean Monnet University, Saint Etienne, France
Start date:	As from 1st September 2027
Duration:	36 months
Application deadline:	15th January 2027

Job description

Objective:	Advanced-stage cancer patients frequently suffer from severe skeletal muscle wasting and impaired muscle function, collectively called **cancer cachexia**. Cancer cachexia is a severe hypo-anabolic, catabolic syndrome characterized by uncontrolled skeletal muscle loss, with or without adipose tissue wasting, that cannot be reversed by conventional nutritional support (Fearon *et al.*, 2013). We previously demonstrated in a murine model of cancer cachexia (*Apc* mice) that tumor progression activates the hypothalamic-pituitary-adrenal axis, increases circulating corticosterone levels, and induces glucocorticoid-responsive transcriptional programs that contributes to muscle wasting (Martin *et al.*, 2022). Furthermore, preliminary data from the team indicate that intracerebroventricular administration of a pro-inflammatory cytokine in healthy mice induces a response that recapitulates key features observed in the mirin model of cancer cachexia, namely activation of the hypothalamic–pituitary–adrenal axis and increased expression of glucocorticoid-dependent catabolic genes in skeletal muscle. **We therefore hypothesize** that cancer-induced neuroinflammation activates hypothalamic inflammatory pathways, thereby contributing to cachexia progression. This project aims to uncover the mechanistic link between neuroinflammation, hypothalamic–pituitary–adrenal axis activation and cancer cachexia. **The recruited doctoral fellow** will address the following aims: 1. To determine the neuroinflammatory status of pre-cachectic and advanced cachectic *Apc* mice by using immunohistochemistry staining of brain sections together with complementary RT-qPCR analyses of hypothalamus-pituitary complex and blood cytokine analyses 2. To determine the contribution of central nervous system immune cells (microglia) to cachexia development using a genetic approach aimed at inhibiting neuroinflammation in *Apc* mice. 3. To determine the impact of neuroinflammation inhibition on cachexia development using a pharmacological approach. This project, which combines complementary biomolecular and physiological approaches at multiple tissue levels, will provide essential insights into the brain-muscle axis in cancer cachexia and help identify a potential therapeutic strategy to combat this condition.
Collaborations and co-supervisions:	The PhD project will be co-supervised by **Pr. Frédéric Charbonnier** (Université Paris-Cité, Paris), who has a strong expertise in the cellular and molecular mechanisms underlying neuromuscular system plasticity, with a particular focus on neuromuscular biology and disease.
Supervisors:	damien.freyssenet@univ-st-etienne.fr - frederic.charbonnier@u-paris.fr
Place of work:	Faculté de Santé, 10 rue de la Marandière, 42270 Saint Priest en Jarez
Required degree	Master's degree in cellular biology or in kinesiology and health sciences

Skills/Experience:	- Animal handling - Molecular biology techniques (RT-qPCR) - Biochemistry (western blot, ELISA, enzymatic analyses) - Microscopy (Immunohistochemistry, confocal imaging) - Transcriptomic or bioinformatic analyses - R or Python coding Previous experience in <u>all</u> techniques listed above is not necessarily expected but motivation, rigor, and willingness to learn are essential. - Ability to work independently and as part of collaborative team - Open-mindedness towards an integrative, whole-body physiological approach of the research project - Capacity to discuss into a constructive scientific dialog - Enthusiasm for developing and creating research
Keywords	Cancer cachexia, mouse, neuroinflammation, skeletal muscle, therapy

Mandatory requirements

Eligibility:	The doctoral fellow: - should not have resided or carried out his/her main activity (work, study) in the country where he/she is being recruited, i.e., France, **for more than 12 months in the 3 years before the application call deadline,** unless this time was part of a compulsory national service or a procedure for obtaining refugee status under the Geneva Convention. - **must be in possession of a master's degree** at the date of the call deadline. Applicants who have completed their cursus but not yet been awarded the formal master's degree by that date will not be considered eligible. - must be **a doctoral candidate** (not already in possession of a doctoral degree at the date of the application call deadline).
Languages:	Oral and written skills must meet the standards of academic English used in international research.

Job details

Type of contract:	Full time position
Gross salary:	The monthly living allowance, including employer and employees' social charges, is €3,500. This amount corresponds to a gross monthly salary estimated to €2,472 and to an estimated net monthly salary before income tax of €1,985.68. In addition to the salary, the doctoral researcher will receive a **mobility allowance corresponding to a total employment cost of €132 per month** (€4752 over 36 months), including employer and employees' social charges to support relocation and mobility-related expenses.
Other benefits:	**Social Protection**: The doctoral researcher will benefit from **full social security coverage**, including health insurance, unemployment insurance, and pension contributions. They will also have access to occupational health services (*médecine du travail*), in accordance with the French public-sector employment framework. **Additional Insurance**: The doctoral researcher will benefit from an employer contribution of **€37.50 per month** towards complementary health insurance, in accordance with the applicable public-sector scheme. **Paid Leave**: The doctoral researcher is entitled to **49 days of paid leave annually** (for 38.5 hours worked per week), in accordance with UJM's working time arrangement, and will enjoy the same employment rights as other public-sector employees. **Relocation assistance**: Through its **EURAXESS Service Centre**, UJM provides dedicated support to international doctoral researchers before and during their stay in Saint-Étienne. Assistance includes visa and residence permit procedures, accommodation guidance, healthcare and administrative formalities, as well as practical advice on settling into France. International researchers and their families can also benefit from integration support and information on French language courses. More information: https://www.univ-st-etienne.fr/fr/international/enseignant-chercheur-post-doctorant-doctorant.html **Transport**: The University reimburses **75% of eligible public transport season-ticket costs** for commuting between home and work, up to a monthly ceiling of **€104.04**, in accordance with current French public-sector regulations. **Sports and culture**: UJM offers a vibrant campus environment and a wide range of sports and cultural activities. Doctoral researchers can access activities offered by the University's Sports Department (SUAPS), including fitness, team sports and well-being activities, subject to applicable registration conditions. The University also organises a rich cultural programme throughout the year, featuring concerts, theatre performances, exhibitions and creative workshops, many of which are free or offered at reduced rates.