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

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PhD Position 20 job vacancy

Reference:	**PP20**
Title:	**Pomegranate polyphenols and resistance training to protect the gut microbiota-muscle axis in the context of chronic inflammatory bowel disorders**
Hiring institution:	Université Clermont Auvergne (UCA)
Location:	Clermont-Ferrand, France
Start date:	As from 1st September 2027
Duration:	36 months
Application deadline:	15th January 2027

Job description

Objective:	Inflammatory bowel diseases are associated with chronic intestinal inflammation, gut dysbiosis and metabolic disturbances that can impair skeletal muscle mass and function. Pomegranate polyphenols, partly converted by gut microorganisms into bioactive metabolites such as urolithins, and resistance exercise may provide complementary benefits. However, their combined effects on the gut-microbiota-muscle axis remain poorly understood. The recruited doctoral fellow (DF20) will investigate whether combining a standardised pomegranate peel extract with resistance training provides greater protection against intestinal, metabolic and muscle alterations than either intervention alone. We hypothesise that this strategy improves intestinal barrier integrity and microbial metabolite production, reduces inflammation and supports muscle metabolism and function. The project combines in vitro assessment of the extract's biological effects, development of a progressive voluntary resistance-training model in mice, and preclinical testing on a high-fat/high-sugar dietary background, with or without experimentally induced colitis. Integrated analyses will connect intestinal inflammation, barrier function, gut microbiota and microbial metabolites with body composition, muscle force, power and fatigability. Functional assessments of cellular bioenergetics will help explore the contribution of mitochondrial and glycolytic adaptations. The project will provide a preclinical proof of concept for combined nutritional and exercise strategies targeting intestinal and muscle health in inflammatory bowel disease. The subject will mainly involve cell biology, bacteriology, animal experimental protocols, animal sampling. Part of the project will also involve technical development.
Collaborations and co-supervisions:	The project brings together M2iSH (UMR 1071 Inserm/UCA) and AME2P (UR 3533, UCA), combining expertise in intestinal biology, host-microbiota interactions, exercise physiology and muscle metabolism. Vincent Martin (AME2P) will contribute expertise in neuromuscular assessment. Collaborations include an industrial partner (France) for extract characterisation and standardisation; Dr Matías Monsalves-Álvarez (Universidad Andrés Bello, Chile) for rodent resistance training and muscle adaptations; and Olivier François (CROC, UCA) for device prototyping.
Supervisors:	Main supervisor with overall responsibility (40%): Mathilde BONNET, M2iSH – mathilde.bonnet@uca.fr Co-supervisor (30%): Adeline SIVIGNON, M2iSH – adeline.sivignon@uca.fr Co-supervisor (30%): Nathalie BOISSEAU, AME2P – nathalie.boisseau@uca.fr
Place of work:	M2iSH, UMR 1071 Inserm/UCA, CBRV, Faculty of Medicine and Pharmacy, 28 place Henri Dunant, 63000 Clermont-Ferrand, France. AME2P, UR 3533, UFR STAPS, Campus Universitaire des Cézeaux, 3 rue de la Chebarde, 63178 Aubière, France.

Required degree	Master's degree or equivalent in Biology, Physiology, Nutrition, Biomedical Sciences or a closely related field.
Skills/Experience:	**Hard skills** - Sound knowledge of cell biology, physiology and/or energy metabolism. - Initial experience in cell culture or molecular biology and quantitative data analysis. - Experience in microbiology, metabolic assays or rodent studies (Animal Experimentation Certification: Project Designer or Experimental Procedure Practitioner, Rat and Mouse Models) would be an asset. Training in project-specific techniques will be provided. **Soft skills** - Scientific curiosity, rigour and critical thinking. - Strong organisational skills, problem-solving abilities, and the ability to work both independently and as part of an interdisciplinary team. - A strong interest in preclinical research and a commitment to animal welfare and research reproducibility.
Keywords	Inflammatory bowel disease; experimental colitis; pomegranate polyphenols; resistance training; gut microbiota; skeletal muscle; cellular bioenergetics.

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 **€2,393**, and to an estimated net monthly salary before income tax of **€1,922**. On top of the monthly salary, the doctoral fellow will receive a **mobility allowance,** including employer and employees' social charges of €132 per month during 36 months, which constitutes gross monthly allowance €94,3 and net monthly allowance of €75,75.
Other benefits:	**Social Protection**: The doctoral fellow will benefit from **full social security coverage**, including health insurance, unemployment insurance, and pension contributions. He/she will also have access to occupational health services (*médecine du travail*), as required by French labour law. **Additional Insurance**: Pursuant to Decree 2022-633 of 22 April 2022, as amended, staff of the Ministry of National Education, Higher Education and Research are required to join the collective health insurance scheme taken out by their employer, i.e. MGEN. The doctoral fellow must enrol as soon as he/she joins the UCA. However, in certain cases, you may be able to apply for an exemption. Further information is available here : https://www.mgen.fr/psc-agents-en-esr-js/parcours-d-affiliation/ **Paid Leave**: The doctoral fellow is entitled to up to **44 days of paid leave annually**, in accordance with national labour law, and will enjoy the same employment rights as other public sector employees, including student union membership. **Transport**: The doctoral fellow benefits from significantly **reduced fares on public transport**, available in all partner cities. Additionally, the host institution will cover 75% of the monthly transportation costs.