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

Co-funded by the European Union

PhD Position 12 job vacancy

Reference:	**PP12**
Title:	**Mathematical modelling and cross species validation of a unified omic framework for muscle function**
Hiring institution:	**USMB**
Location:	University Savoie Mont Blanc, Chambéry, France.
Start date:	As from 01st January 2027
Duration:	36 months
Application deadline:	6th May 2026

Job description

Objective:	The recruited doctoral fellow (DF12) will develop advanced mathematical models to characterize muscle force capacity across diverse contraction conditions including shortening velocity, length, fatigue and recovery. This fundamental research establishes a functional framework of muscle termed Muscle MechanOmics by integrating mechanical and biological variables into a unified theory. DF12 will refine established frameworks such as the Force Velocity Endurance model to analyse how contraction velocity impacts fatigue development. Furthermore, the project involves developing new models to investigate the effects of stimulation frequency on contraction speed and fatigability while implementing viscoelastic components. This work follows a continuous iterative loop where experimental observations validate model predictions and discrepancies drive mathematical evolution. Based at USMB, DF12 will lead theoretical development and conduct in vivo human experiments on the adductor pollicis muscle with B. Morel and M. Bowen in Chambéry. These high precision evaluations rely on the synchronization of electrical stimulation with motorized control using patented ergometers developed by our team to assess muscle function independently of subject cooperation. In collaboration with J. Gondin at the INMG in Lyon DF12 will leverage a non-invasive ergometer designed for longitudinal tracking of plantar flexor muscle function in anesthetized mice. This dual species approach, implying experiments both in human and mice, enables DF12 to verify and extend model applicability across different muscle groups species and scales. The project requires a strong commitment to interdisciplinarity as DF12 will interact with researchers in applied mathematics, biophysics, biomechanics, physiology and biology. While specific applied projects are led by other experts in the team, DF12 will actively participate in transferring fundamental insights to link organ scale capacities with whole organism locomotion in contexts ranging from elite sports and clinical health to evolutionary ecology. Joining our team offers the opportunity to work at the forefront of functional comparative physiology and biomechanics within an internationally recognized center for multi scale muscle modelling.
Collaborations and co-supervisions:	The PhD project will be co-supervised by Baptiste Morel, Maximilien Bowen and Julien Gondin.
Supervisors:	Baptiste Morel – baptiste.morel-prieur@univ-smb.fr Maximilien Bowen – maximilien.bowen@univ-smb.fr Julien Gondin – julien.gondin@univ-lyon1.fr

Place of work:	USMB – LIBM - Campus Scientifique - 73376 Le Bourget-du-Lac, France In collaboration with INMG, CNRS 5261, INSERM U1315, UCBL1 Faculté de Médecine - 69008 Lyon, France
Required degree	Master's degree or equivalent in Biomechanics, Physiology, Biopysics, or Computational Biology.
Skills/Experience:	- Proficiency and strong interest in mathematical modelling and the development of theoretical frameworks for biological systems. - Demonstrated experience in conducting in vivo experimental protocols for muscle function evaluation in human and/or murine models. - Strong motivation to develop and master experimental competencies in both species to ensure proficiency across the dual-species validation framework. - Proficiency in programming for data analysis and numerical simulation using platforms like MATLAB or Python. - Strong aptitude for working across scientific disciplines including biology, biophysics, biomechanics, physiology. - Interest in transferring fundamental insights to applied fields such as sports, clinic and/or ecology.
Keywords	Modelling; Muscle function; Ergometry; Electrostimulation; Multi-species

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 **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 €2520, and to an estimated net monthly salary before income tax of 2025€. On top of the monthly salary, the doctoral fellow will receive a **mobility allowance,** including employer and employees' social charges of €4,752 over the 36 months of the working contract. This amount corresponds to a gross monthly allowance estimated to €95 and to an estimated net monthly allowance before income tax of approximately €76.
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**: The doctoral fellow may choose to subscribe to complementary health insurance plans, such as LMDE or SMERRA, at affordable rates (approximately €42 *per* month). Host institutions will provide 15 euros per month. **Paid Leave**: The doctoral fellow is entitled to up to **45 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. The reimbursement is set at 75% of the actual cost, up to a maximum of €104.04 per month.