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

Co-funded by the European Union

PhD Position 09 job vacancy

Reference:	**PP09**
Title:	**Role of TGFβ signalling in connective tissue progenitors during musculoskeletal assembly**
Hiring institution:	ENS de Lyon
Location:	Lyon, France
Start date:	As from 01st January 2027
Duration:	36 months
Application deadline:	6th May 2026

Job description

Objective:	The recruited doctoral fellow (DF09) will investigate the role of TGFβ signalling in connective tissue progenitors during embryonic and foetal musculoskeletal development using the mouse model. The project will combine Cre–loxP-based lineage tracing and conditional gene inactivation to analyse the function of TGFβ signalling in specific embryonic lineages. The coordinated development of skeletal muscles and their associated connective tissues is essential for the formation of a functional musculoskeletal system. Muscle-associated connective tissue (MCT) progenitors are key regulators of muscle patterning and integration, and defects in their interaction with muscle cells are implicated in several congenital disorders. These progenitors arise from distinct embryonic sources along the body axis—neural crest in the head, somitic mesoderm in the trunk, and lateral plate mesoderm in the limb—while the neck represents a transition zone of mixed origin. Although TGFβ signalling is required in MCT progenitors for musculoskeletal development in both head and limb, whether its function is conserved across embryonic origins and anatomical contexts remains unknown. The project will assess the consequences of TGFβ receptor 2 (TGFβR2) deletion in neural crest– and lateral plate–derived connective tissue progenitors. Mutant embryos and foetuses will be analysed at tissue, cellular, and molecular levels to determine how altered signalling affects muscle patterning and connective tissue organisation. To identify downstream gene regulatory networks, the project will integrate single-cell multi-omics, combining scRNA-seq and scATAC-seq to define transcriptional programs and regulatory landscapes in connective tissue and muscle progenitors. Candidate effectors will be validated *in vivo* and in co-culture systems through gain- and loss-of-function approaches. This project will provide mechanistic insight into TGFβ-dependent tissue interactions during musculoskeletal morphogenesis and into the developmental bases of TGFβ-related connective tissue disorders. The doctoral candidate will benefit from an international environment and access to advanced imaging, single-cell multi-omics, and dedicated bioinformatics support.
Collaboration:	The PhD project will benefit from close collaboration with Jonathan Enriquez and Yad Ghavi-Helm (CNRS Research Directors), who are in charge of the on-site Equipex+ Spatial-Cell-ID platform, providing access to state-of-the-art multi-omics approaches. (https://spatial-cell-id.ens-lyon.fr/)
Supervisor:	Eglantine Heude - eglantine.heude@ens-lyon.fr
Place of work:	Institut de Génomique Fonctionnelle de Lyon (IGFL) 32-34 avenue Tony Garnier 69007 Lyon

Required degree	Master's degree or equivalent in Developmental Biology, Genetics, or Cell Biology
Skills/Experience:	- Solid training in molecular and cellular biology techniques - Basic experience in microscopy and/or image analysis; exposure to the mouse model is an advantage - Strong interest in bioinformatics; prior experience with R/Python or omics data analysis is a plus - Ability to work in an interdisciplinary and international research environment
Keywords	Musculoskeletal system formation / TGFβ signalling pathway / cell-cell communications / single cell multiomics / rare congenital disorders

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 €2,500, and to a net monthly salary before income tax of €2,100 (estimated amount). On top of the monthly salary, the candidate will receive a **mobility allowance,** including employer and employees' social charges of €4752, paid as a monthly salary supplement. This amount corresponds to a gross monthly allowance estimated to €98 and to an estimated net monthly allowance before income tax of approximately €63.
Other benefits:	**Social Protection**: The candidate 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. The HR department can offer assistance with obtaining a social security number. **Additional Insurance**: The candidate is required to subscribe supplementary health insurance, with partial coverage provided by the host institution. **Paid Leave**: The candidate is entitled to **25 days of paid leave annually** (for 35 hours worked per week), in accordance with national labour law, and will enjoy the same employment rights as other public-sector employees, including student union membership. **Transport**: The candidate 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. **Relocation assistance via Espace Ulys** (EURAXESS center of the Université de Lyon): the candidate can be provided with special relocation assistance and help for immigration and administrative, accommodation, healthcare and integration formalities. Other benefits: - A laboratory manager as a contact person for all administrative matters before and during their stay, - Dedicated information tools: HR Information, Welcome booklet, etc. - The opportunity for scientists and their partner to take a 22-hour beginner's French as a Foreign Language course at ENS Lyon with other scientists, - A guided tour of both campuses in English to help the candidate to discover their new environment.