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

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# PhD Position 02 job vacancy

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| Reference: | **PP02** |
| Title: | **Dissecting mutation-specific neuronal vulnerability in Friedreich's Ataxia using zebrafish models** |
| Hiring institution: | **UCBL** |
| Location: | University Claude Bernard Lyon 1, Villeurbanne, France. |
| Start date: | As from 01st January 2027 |
| Duration: | 36 months |
| Application deadline: | 6th May 2026 |

## Job description

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| Objective: | **The recruited doctoral fellow (DF02)** will develop a project aiming at dissection mutation-specific neuronal vulnerability in Friedreich ataxia (FA). FA is a progressive neurodegenerative disease caused by frataxin deficiency, leading to impaired iron-sulfur (Fe-S) cluster biogenesis, mitochondrial dysfunction, and metabolic failure. While most patients carry GAA-repeat expansions that reduced frataxin expression, rare missense mutations such as R165C result in a structurally intact but functionally impaired protein, associated with atypical and mutation-specific phenotypes. Specifically, individuals in a family with the R165C mutation at homozygous state, display motor axonal involvement in addition to sensory neuropathy, an unusual feature in classical FA, suggesting mutation-specific neuronal vulnerability. The mechanisms underlying this differential sensitivity remain unknown.<br>This PhD project will leverage complementary zebrafish frataxin knockout (fxn-/-) and knock-in fxnR128C models to test the central hypothesis that partial frataxin dysfunction triggers distinct metabolic adaptations compared to complete loss, leading to divergent outcomes in motor versus sensory neurons. Using neuron-specific Gal4/UAS reporter lines, we will isolate defined motor and sensory neuron populations and their mitochondria from zebrafish larvae. In combination with high-resolution respirometry, RNA sequencing, proteomics and/or metabolomics, this approach aims to identify mutation-specific metabolic adaptations and stress responses in the cell types that are differentially affected in FA. Identified defects will be further investigated during disease progression through cryosectioning and immunofluorescent stainings in zebrafish juveniles and adults.<br>This project will provide mechanistic insights into mutation-specific disease trajectories, with the goal to identify therapeutic targets for Friedreich's ataxia. |
| Collaborations and co-supervisions: | The PhD project will be co-supervised by Dr. Hélène Puccio and Dr. Sandrine Bretaud. |
| Supervisors: | Hélène Puccio - helene.puccio@inserm.fr<br>Sandrine Bretaud - sandrine.bretaud@ens-lyon.fr |
| Place of work: | Institut NeuroMyoGène – Pathophysiology and Genetics of Neuron and Muscle (INMG-PGNM) - UCBL-CNRS UMR5261 - Inserm U1315<br>Université Claude Bernard - Lyon I - Faculty of Medicine & Pharmacy, 3rd floor<br>8 Avenue Rockefeller - 69008 Lyon |
| Required degree | Master's degree or equivalent in neuroscience, molecular biology, biochemistry, genetics, or related biomedical sciences |

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| Skills/Experience: | This PhD project is open to highly motivated candidates with a strong interest in neurodegeneration, mitochondrial biology, and in vivo disease modeling. While prior expertise in all techniques is not expected, the following skills would be advantageous:<br>• Experience with molecular biology techniques<br>• Familiarity with fluorescence microscopy or confocal imaging<br>• Experience with zebrafish or other animal models<br>• Exposure to transcriptomics, proteomics, metabolomics, or bioinformatics analysis<br>• Experience with respirometry or metabolic assays |
| Keywords | Neurodegeneration, Mitochondrial biology, Genetic disease modelling, Metabolism, Zebrafish |

## Mandatory requirements

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| Eligibility: | The doctoral fellow:<br>- 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.<br>- 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

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| 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 €2,440 and to an estimated net monthly salary before income tax of approximately €1,976.<br><br>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 €92 and to an estimated net monthly allowance before income tax of approximately €74. |
| Other benefits: | **Social Protection**:<br>The 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.<br><br>**Additional Insurance**:<br>The fellow may choose to subscribe to complementary health insurance plans, at affordable rates (approximately €70 *per* month), of which 50% is paid by the employer.<br><br>**Paid Leave**:<br>The fellow is entitled to up to **33.5 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.<br><br>**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.<br><br>**Transport**:<br>The fellow benefits from significantly **reduced fares on public transport**, available in all partner cities. Additionally, the host institution will cover 50% of the monthly transportation costs.<br><br>**Sports and culture:**<br>The fellow will enjoy the cultural environment provided by the Lyon 1 campuses, where numerous exhibitions and activities open to the general public are organised throughout the year. The fellow may play his/her favourite sport in the largest University Sports Association in France, where over 30 activities are on offer year-round through the Sports & Physical Activity University Department. The fellow may also join one of the 70 student associations that unite the University. |