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

Co-funded by the European Union

PhD Position 10 job vacancy

Reference:	**PP10**
Title:	**Engineering the Bone Microenvironment to Understand Osteogenesis Imperfecta and Improve Treatment Responses**
Hiring institution:	**Lyon1**
Location:	University Claude Bernard Lyon 1, Villeurbanne, France.
Start date:	As from 1st September 2027
Duration:	36 months
Application deadline:	15th January 2027

Job description

Objective:	Why do patients with osteogenesis imperfecta (OI), a genetic disease causing fragile bones, show different disease severities and treatment responses? Could the environment surrounding bone cells contribute to these differences? This PhD will combine **in vivo studies**, **bone biology** and **3D biomimetic adaptable materials (BAM)** to investigate how the extracellular matrix (ECM) influences bone fragility and therapeutic responses. The doctoral researcher will work across two complementary laboratories and undertake three interconnected tasks: Task 1 – **Understanding bone fragility in vivo**. Using healthy and OI mouse models (*oim* mouse, a model of severe OI), the student will investigate bone structure, mechanical properties and ECM composition, including collagen and glycosaminoglycans (GAGs). Together with existing human data, these results will identify key characteristics of healthy and diseased bone environments before and after treatment. Task 2 – **Can the bone environment change cell behaviour?** The student will fabricate tuneable 3D BAM reproducing selected features of healthy and pathological ECM. A central experiment will compare **healthy cells grown in diseased environments and OI cells grown in healthy environments**, to determine whether the ECM can induce or rescue disease-associated defects. The role of GAGs in these interactions will be specifically investigated. Task 3 – **Connecting therapeutic responses in vitro and in vivo.** The student will investigate the effects of selected bone-targeting treatments in OI *oim* mice and compare them with responses observed on BAM. Key findings will subsequently be explored using patient-derived cells, when available. **Training environment**: The student will spend substantial time in both laboratories, gaining hands-on experience in animal studies, bone characterization, biomaterial fabrication and advanced cell culture. Complementary scientific expertise, dedicated engineers and technical support will ensure training across both biological and engineering approaches.
Collaborations and co-supervisions:	Co-supervised by Roland Chapurlat (LYOS) and Elisa Migliorini (SyMMES), combining biomaterials engineering, OI mouse models and bone biology.
Supervisors:	Co-directed by Elisa Migliorini (SyMMES) – elisa.migliorini@cea.fr and Roland Chapurlat (LYOS) – roland.chapurlat@inserm.fr Co-supervised by Romain Vivés (IBS, Grenoble) and Alexandre Mercier (LYOS, Lyon)
Place of work:	SyMMES laboratory, IRIG, CEA-Grenoble, France / LYOS laboratory, Lyon, France
Required degree	Master's degree or equivalent in biomaterials, biomedical engineering, cell biology or a related field.

Skills/Experience:	Strong **motivation for interdisciplinary research** and willingness to learn diverse experimental techniques, from biomaterial fabrication and cell culture to bone characterization and in vivo studies. Previous expertise in some of these areas is an advantage. **High level of autonomy, initiative, and problem-solving ability,** with the confidence to take ownership of the project and actively seek guidance when needed. **Excellent communication and interpersonal skills**, including the ability to proactively exchange information, coordinate activities, and maintain effective collaboration between two research teams located in different cities. Adaptability, intellectual curiosity, and enthusiasm for working outside one's initial field of expertise. Good organizational skills and the ability to plan experiments and manage priorities across two laboratories. Good written and spoken English.
Keywords	Osteogenesis imperfecta; bone extracellular matrix; 3D biomaterials; glycosaminoglycans; mouse models; personalized medicine

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 €2,440 and to an estimated net monthly salary before income tax of approximately €1,976. 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**: 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. **Additional Insurance**: 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. **Paid Leave**: 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. **Transport**: 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. **Sports and culture:** 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.