

## The University of Limoges is recruiting an

# Engineer in Biologics technology and instrumentation

*Catégorie A – ITRF / Post-doctoral fellow*

### Presentation of the University of Limoges

Founded in 1968, the University of Limoges is a regional university on a human scale that educates more than 16000 students and employs more than 1800 permanent staff.

At the heart of Europe, it is an important center of multidisciplinary higher education, in an environment that is most conducive to scientific development. The university is open, dynamic with many opportunities for interactions, a diverse student population, up to date structures, close collaborations between teams, training based on very high-level research and clearly identified opportunities. Its scientific excellence, with cutting-edge laboratories and large-scale partnerships, is helping to invent the world of tomorrow.

The University is structured into 5 Research Institutes:

**GEIST** : Genomics, Environment, Immunity, Health and Therapeutics

**XLIM** : Electronics and Hyperfrequencies, Photonics and Coherent Sources, Mathematics, Computer Science and Images

**IPAM** : Institute for Processes Applied to Materials

**SHS** : Science of Man and Society

**GIO** : Governance of Institutions and Organizations

### Position location

University of Limoges – GEIST Institute / Strong collaboration with XLIM Institute

### Context

**INTENSIVE: INTElligences Numériques au Service de l'Ingénierie pour le Vivant à l'Université de LimogEs (that stands for Digital Intelligence at the Service of Engineering for Life at the University of Limoges)**

Thanks to its multidisciplinary dynamics, the University is running an inter-institute project on Life Engineering, in order to integrate a complete value chain combining scientific and technological aspects with societal and legal dimensions.

*The current challenges in Engineering for Life cover very broad disciplinary fields which aim in particular at :*

- 1. Improving prevention (i.e. earlier, more inclusive, multimodal diagnosis),*
- 2. Improving the quality and sustainability of care (i.e. support for the practitioner, selectivity and traceability of treatments),*
- 3. Increasing the performance of the subjects (i.e. augmented human).*

In this context the Intensive project targets the use of advanced microscopy and spectroscopy techniques as an exploratory approach including several (multiphoton fluorescence, second and third generation harmonic generation, coherent Raman scattering, electron microscopy, etc.). The data acquired by these innovative methods will be associated with clinical data. All of these data will be analysed using artificial intelligence with the aim of identifying new specific signatures of pathologies and developing a tool for practitioners, patients and researchers. This medicine, which in the future will be more predictive, personalised and precise, must be validated in the legal field to guarantee respect for fundamental human rights.

This project is based on a panel of recognised and complementary skills from the GEIST, IPAM, XLIM, IRSHS and IRGIO institutes of the University of Limoges and will enable the development of new tools and new skills at the interfaces between the institutes.

In the context of the Intensive project, the GEIST Institute provides different biological models in the connection with the skills of its laboratories: models of deposition diseases, various types cancer, neuropathies and bacterial biofilms.

The proof of concept will be carried out on one model, and then will be extended to other models, thus leading to a significant number of images to be acquired and volume of data to be managed. In addition, the heterogeneity of the models to be analyzed requires strong curiosity and scientific openmindedness on the part of the person who will be recruited, especially in order to compare the results from analyzes of the present study to the biological data of models.

Link to the Intensive project website : <https://unilim.fr/intensive/>

## Missions

In the context of the Intensive project, we are recruiting an engineer in charge of biological sample preparation and multimodal image acquisition. He/she will be attached to the GEIST Institute that unites all teams from the Biology and Health sector, and will collaborate closely with the XLIM Institute for imaging and artificial intelligence questions.

- 1- Preparation of samples:
  - Tissue sections (frozen or embedded in paraffin),
  - Histological staining,
  - Immunofluorescence
  
- 2- Multimodal image acquisitions :
  - Image acquisition with a confocal microscope equipped with a spectral detector, a CARS microscope or a multiphotonic microscope on samples processed by histological staining, immunofluorescence, or untreated
  - Image analysis , annotation and classification
  
- 3- Data management :
  - Management of an image bank
  
- 4- Additional responsibilities :
  - Gather and edit results
  - Analyze and interpret results
  - Write protocols
  - Manage laboratory notebook
  - Write short reports
  - Present results to biologists and non-specialists
  - Use software dedicated to image analysis
  - Technological and scientific monitoring
  - Enforce hygiene and safety instructions in the various laboratories

## Required profil, skills

### PROFILE REQUIRED:

- MSc degree in biological sciences. Experience in microscopy and image analysis is highly desirable.

### KNOWLEDGE:

- Solid experience in Biology and Health (cursus in cellular and molecular biology (MSc degree)
- Proficiency in microscopy and image processing and analysis
- Expertise in informatics applied to biology
- Proficiency in English (fluent)

### OPERATIONAL SKILLS / KNOW-HOW:

- Histology
- Microscopy
- Image analysis
- Technological monitoring

### BEHAVIORAL SKILLS / KNOW-BEING:

- Ability to work independently (organizational skills, versatility, adaptability) as well as in a team (interpersonal skills) is essential.
- The candidate should be able to work in a transdisciplinary environment and to interact with specialists from other scientific disciplines (curiosity, open-mindedness)

### Relationships:

- Internally:
  - With researchers of the GEIST Institute
  - With photonics and Artificial Intelligence researchers of the XLIM institute involved in the project
  - With all members of the project, during scientific meetings and seminars
- Externally:
  - With researchers from fields concerned by the project (seminars, conferences, thematic days)

<b>Nature of the contract</b>	<b>Fixed term contract</b> <b>14 months</b>
<b>Starting date</b>	<b>May 2021</b>
<b>Application</b>	CV + cover letter to be sent by email only before <b>20/05/2021</b> to :  <p style="text-align: center;"><b>Ms. Claire Carrion</b> CNRS Microscopy engineer  <b>Ms. Stéphanie Durand-Panteix</b> Project Manager of <i>Intensive</i> project  <b>Ms. Véronique Blanquet</b> Head of the GEIST Institute, coordinator of the <i>Intensive</i> project</p> <p style="text-align: center;"><b>Mailing adress :</b> <a href="mailto:claire.carrion@unilim.fr">claire.carrion@unilim.fr</a>  <a href="mailto:stephanie.durand-panteix@unilim.fr">stephanie.durand-panteix@unilim.fr</a>  <a href="mailto:veronique.blanquet@unilim.fr">veronique.blanquet@unilim.fr</a></p>
<b>Work quota</b>	100%