<p style="text-align:center">**Junior Professor Chair**
Job Profile Sheet</p>

Institution/Organization: University of Limoges (UNILIM)
Site: Limoges – P&T Laboratory, UMR INSERM U 1248
Academic Region: Limoges

Component: Faculty of Pharmacy, Limoges / Inserm U1248 France

Keywords: deep learning, machine learning, pharmacology, pharmacometrics, multi-scale, multi-source

Duration: 4 years

Scientific Theme: System pharmacology augmented by artificial intelligence

Corresponding CNU/CoNRS/CSS Section(s): CSS7 Inserm Health Technologies. Section 85 CNU Pharmacy.

Job Title to Publish:
Junior Professor Chair: PRESAGER: System Pharmacology Augmented by Artificial Intelligence
We propose a Junior Professor Chair for a candidate capable of conducting innovative research in pharmacological modeling integrating advanced Machine Learning (ML) and Deep Learning (DL) techniques. This is a four-year fixed-term contract, after which the candidate and their dossier will be evaluated by a jury for integration into the position of university professor.
The selected candidate must be able to adapt and implement recent algorithms to predict clinical outcomes such as treatment efficacy and side effects, disease progression, and/or patient survival. The candidate must monitor and adapt recent algorithms in the fields of causal machine learning, symbolic regression, and data augmentation. Alongside ML/DL approaches, numerous published PK, PK/PD, disease progression, or system pharmacology models will serve as an important data source. They cover multiple scales from molecular data with PB/PK and PK/PD studies, plasma/tissue PK models, to individual-level exposure/response models or side effects models.
These models will be used to generate data via Monte Carlo simulations, which can be combined with anonymized experimental data using deep learning methods. These multi-source and multi-scale data sets will allow the creation of meta-models through ML/DL approaches (enabling the management of non-linear relationships between levels and the combination of various types of data). These models may involve creating latent variables to summarize relationships between different variables. Clustering methods will be used to detect specific at-risk subgroups. Predictive performance of efficacy (graft survival for transplantation or bacterial eradication for anti-infectives) or occurrence of side effects will be evaluated in external databases.

 RESEARCH
Main Responsibilities:
- Develop and integrate multi-scale models using ML and DL approaches.

- Co-supervise doctoral research, including study planning and resource management.
- Maintain constant scientific and technological watch to stay at the forefront of progress in pharmacometrics and predictive algorithms.
- Publish research results in at least three Q1-Q2 scientific journals during the four years of funding.
- Collaborate with clinical and industrial partners to clinically validate and valorize developed models.

Required Skills and Qualifications:
- PhD or doctorate in pharmacology, bioinformatics, statistics, or a related field with specialization in machine learning acquired during initial or subsequent training.
- Demonstrated experience in using R or Python for developing ML and DL algorithms.
- Ability to work independently and initiate new research directions.
- Good communication skills in English, both written and oral.

Personal Qualities:
- Strong motivation and passion for research and innovation.
- Ability to work as part of a team and collaborate with various stakeholders.
- Proactivity in seeking funding and managing projects.
- Ability to write scientific articles.

TEACHING:
The candidate must integrate into the Biophysics Department, currently composed of 2 Full Professors, 3 Associate Professors, 1 Research Engineer, and 1 Technical Assistant. They will be involved in teaching (DFGSP and DFASP in pharmacy curricula, DU, M1 Biology Health, and Master Public Health and One Health programs). The main teaching needs include mathematics, biophysics, statistics, and broadly defined computer science, as well as the use of artificial intelligence in health and risk modeling. Depending on the candidate's profile, they may also be involved in teaching digital health, health data transfer and protection concepts, telemedicine, prevention, home care, chronic disease remote monitoring (diabetes, hypertension, heart failure, etc.), electronic medical records, applications, and home automation.

TEACHING DEPARTMENT:
Biophysics, Biostatistics, and Pharmaceutical Physical Chemistry

Location:
Faculty of Pharmacy, Limoges

Teaching Team:
Biophysics, Biostatistics, and Pharmaceutical Physical Chemistry Department

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Department URL: [Faculty of Pharmacy, Limoges](https://www.pharmacie.unilim.fr/)

RESEARCH:
Research Team Name:
Inserm U1248 Pharmacology & Transplantation

Location:
CBRS, Faculties of Medicine and Pharmacy, Limoges

Scientific Contact:
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Laboratory URL: [U1248 P&T](https://www.unilim.fr/p-and-t/)

Laboratory Description:
The INSERM U1248 unit focuses part of its research on multi-scale pharmacological approaches that combine mechanistic models and data-driven algorithms at various scales (molecular, cellular, tissue, and clinical). Our goal is to integrate sophisticated quantitative models to describe and predict pharmacokinetics (PK), pharmacodynamics (PD), and the benefit-risk assessment of drugs, especially those with a narrow therapeutic margin. The REXETRIS project, a Health Data Hub winner, and the DIGPHAT project, funded by the PEPR Santé Numérique, are key examples of our involvement in cutting-edge translational research using AI tools. The development of new algorithms opens clinical application perspectives for optimizing the benefit-risk balance of medications.

Resources:
Human Resources:
The candidate can recruit a PhD student on the budget of this Junior Professor Chair. They will work in a team led by a Full Professor of Pharmacology with extensive experience in machine learning, alongside an INSERM study engineer in biostatistics and artificial intelligence and two contract data scientists with similar profiles.

Financial Resources:
Supported by the National Research Agency (ANR)……………………………200,000 €

Additional Information:
Special Required Skills:
- PhD or doctorate in pharmacology, bioinformatics, statistics, or a related field with specialization in machine learning acquired during initial or subsequent training.
- Demonstrated experience in using R or Python for developing ML and DL algorithms.
- Ability to work independently and initiate new research directions.
- Good communication skills in English, both written and oral.

Recruitment Process : https://www.unilim.fr/category/recrutement/
Application Submission: https://www.galaxie.enseignementsup-recherche.gouv.fr/ensup/cand CPJ.htm