

Position offer details

Post Doctoral fellowship @ University of Liège, Mass Spectrometry Laboratory, Omics Unit:
Mass spectrometry-based proteomics/peptidomics and metabolomics Research Scientist

- Position: Full time – PhD Post Doctoral researcher
- Research program: F.R.S.-FNRS PROJECTS CALL 2022
- Contract starting date: 01-01-2024 (can be slightly delayed)
- Contract duration: 1 year renewable twice (total 3 years)
- Laboratory/Location: Mass Spectrometry Laboratory of the University of Liège, Institut de chimie B6c, quartier Agora Allée du six août, 11, B4000 - Liege – BELGIUM
- Required degrees: PhD in Sciences / Biochemistry / Biomedical Sciences
- Experience required: PhD thesis in the field of Mass Spectrometry / Proteomics
- Indicative average net income per month: 2800 euros

Eligibility criteria

PhD Post Doctoral researcher.

Holder of a PhD degree at the latest on the date of his / her engagement.

Being in a situation of international scientific mobility.

The researcher cannot have resided or carried out his/her main activity (work, studies, etc.) in Belgium for more than 24 months in the three years immediately before the starting date.

The researcher will receive from the host university a tax-exempt postdoctoral fellowship subject to the social security of salaried workers.

The first commitment period must begin at the latest 10 years, from date to date, after obtaining the PhD degree.

Job Purpose:

The position is linked with a research project funded by [F.R.S.-FNRS](#) in the frame of the “PROJECTS CALL 2022”. The partners of the project are the Catholic University of Louvain (Pr. Sophie Gohy, MD PhD), and the Mass Spectrometry Laboratory (Dr. Gabriel Mazzucchelli) of the University of Liege.

Project description:

Title: Sweat biomarker signature for diagnosis and personalized therapeutic follow-up of patient with CF. Towards a new non- invasive sweat self-sampling-based screening diagnostic tests.

Acronym: SmartSweatOmics4CF

Abstract:

The ultimate goal of SmartSweatOmics4CF is to improve the care and lives of patients with cystic fibrosis (CF). To achieve this goal, we propose to work on the following 3 axes:

- (1) The development of an alternative diagnostic test based on sweat biomarkers for the detection of defective or deregulated CFTR function and personalized follow-up of patients with cystic fibrosis undergoing treatment. Our previous results have demonstrated that proteomic analysis of sweat is a promising approach for non-invasive and individualized patient monitoring. A longitudinal proteomic and metabolomic study on a large number of patients and healthy individuals (n=200 in total) will allow to refine the signature of the highlighted biomarkers.
- (2) The development of new non-invasive sweat self-sampling-based screening diagnostic tests. The potential of human sweat as a biofluid of interest is important, especially because of its non-invasive character. We propose to work on an unstimulated sweat self-sampling method. This "dried sweat extract" (DSE) sampling strategy could ultimately revolutionize the way human sweat will be used for diagnostic and therapeutic purposes.
- (3) To innovatively enrich the knowledge on the biological mechanisms inducing complications of the respiratory system in order to anticipate the clinical outcomes of patients treated for cystic fibrosis. The ALI-HBEC reference model (derived from several individuals) will be extensively characterized and analyzed under different experimental conditions (CFTR modulating drugs) by state-of-the-art technologies, including apical secretome analysis, spatial proteomics and single cell proteomics. These analyses will allow the evaluation of the response of the biological system to therapeutic agents and eventually to deduce the underlying biological mechanisms.

Methodologies that will be applied in the project:

Downscaled shotgun proteomics and metabolomics of human sweat.

Equipment: Q Exactive Plus, TimsTOF PRO2, TimsTOF SCP, (nano)UPLC.

Spatial proteomics approach combining (1) single cell proteomics, (2) pixel by pixel shotgun analyses of laser microdissected tissue sections and (3) MALDI imaging.

Equipment: FACS SONY MA900, LEICA LMD7000 Laser Microdissector, TimsTOF PRO2, TimsTOF SCP, UPLC, Solarix XR 9.4T FT-ICR, RapifleX MALDI.

Your profile:

Basic qualifications:

- Strong knowledge of mass spectrometry-based analyses and bioinformatics workflows for proteomics.
- Good sense of organization and work scheduling.
- Excellent written communication skills.
- Ability to work in a dynamic team
- Computer skills (Microsoft Office suite and standard proteomic software)
- Knowledge in Biology

Preferred qualifications:

- PhD degree in life sciences (chemistry, biochemistry, biomedical sciences) oriented in mass spectrometry and proteomics.
- Background in peptidomics and metabolomics
- Knowledge of mass spectrometry proteomics software
- Knowledge in clinical Biology
- Previous experience of work under quality assurance system

[Why MSLab @University of Liège?](#)

The Mass Spectrometry Laboratory (MSLab) is a multidisciplinary team led by Prof. Gauthier Eppe (previously under Prof. E. De Pauw), consisting of chemists, biochemists, and biomedical researchers. The team includes approximately 40 members (1 Director, 5 permanent staff, 4 Post-docs, Ph.D. students, 7 Technicians, 4 Research Engineers). Gabriel Mazzucchelli, the chief research logistician, leads the Omics unit, where he oversees scientific research, technique development, and collaborations involving omics studies based on mass spectrometry. Since 2001, he has developed MS-based methods for biomolecule characterization and proteomic workflows to enable the analysis of complex biological samples. He has participated in several international organizations as the leader of the "Proteomic working group" (COST Actions). As of 2022, he serves as the Vice-President of the Belgian Proteomics Association (<https://belgianproteomics.be/>) and President of the Council of the Scientists Group of ULiège (2020-).

For over two decades, the MSLab-Omics unit has participated in numerous research projects within proteomics and biomolecule characterization using mass spectrometry. The group has published over a hundred scientific papers in international journals. MSLab-Omics is a pivotal leader in proteomics, innovating analytical methods using high-end instrumentation (10 different mass spectrometers), closely tied with local, national, and international partners. This includes characterizing proteomes altered by specific post-translational modifications, conducting traditional differential proteomics, and integrating proteomics, peptidomics, and metabolomics of biological systems. They also perform microproteomic studies, analyze laser-microdissected tissue samples, and standardize absolute quantification methods for biomolecules in complex matrices. All experiments are conducted within a quality system (ISO 17025 environment), ensuring methodological reliability. The laboratory has established a proteomic platform fostering numerous academic and industrial collaborations.

MSLab has utilized MALDI imaging, developed over several years, for various applications. Recent advancements in the biomedical domain led to the "imaging-guided proteomics" concept. This method identifies areas through MS imaging that share common spectral characteristics, which are then microdissected for proteomic analysis. Through advancements in "downscaling proteomics," detailed in numerous publications, the team can now perform laser tissue microdissection on smaller histological areas (equivalent to about 10-30 cells) for proteomic analysis, effectively applied to heterogeneous tumor studies.

Gabriel Mazzucchelli's team actively pursues advancements in reducing analytical scales and "single cell" proteomics, establishing a unique single cell proteomics platform in the Wallonia-Brussels Federation. The recent ChipOmics project (Win2Wal 2020-2024, €2.2M) facilitated

this, focusing on an innovative microfluidic chip for sample preparation from minimal biological material. Furthermore, in collaboration with [GIGA](#) Cancer (ULiège), Gabriel Mazzucchelli obtained an "Advanced Technology" grant (2022) of €900k from the Foundation Against Cancer, enabling the acquisition of a state-of-the-art mass spectrometer for analyzing single cells or samples with low protein content (TIMS-ToF SCP, Bruker).

Simultaneously, Gabriel Mazzucchelli has spent over four years studying human sweat proteomics (with 1 project completed and the current one). This research resulted in three scientific papers, two of which are already published. The first discusses characterizing the human eccrine sweat proteome, emphasizing the biological variability in sweat protein profiles (DOI: 10.3390/ijms221910871). This research established standardized sample collection and optimized shotgun proteomics, enhancing sweat proteome coverage depth substantially compared to earlier studies. The findings suggest that proteomic profiling of sweat offers a promising method for non-invasive, personalized monitoring of protein biomarkers related to biometric tracking, clinical monitoring, and personalized medicine. The second paper presents a differential proteomic analysis of sweat from cystic fibrosis patients, identifying potential biomarkers for personalized therapeutic monitoring (DOI: 10.3390/cells11152358). The third study identified biomarkers for pulmonary and cardiovascular complications in COVID-19 positive patients. These studies further underscore the potential of sweat analysis in personalized medicine.

[Why @Liège?](#)

You will have an exciting postdoc experience at the University of Liège, where serious research meets a fun city life. Liège is in the center of Europe and has a mix of old history, new ideas, and lots of different cultures. It's a pretty place with old buildings, busy markets, and great food. As a postdoc here, you'll work hard on your research but also enjoy living in Liège, known for friendly people and a welcoming vibe. The city has parks, interesting museums, and many events, giving you things to do when you're not working. Also, because of its location, you can easily visit other parts of Europe when you have free time. The university is a place where people from many backgrounds come together, just like the city itself. You'll feel at home with the kind people you'll meet here, both at the university and in town. In Liège, your postdoc time will be more than just learning; it will be a full experience that makes your life richer and helps you grow both as a researcher and as a person.

How to apply?

Send the following information by e-mail to gabriel.mazzucchelli@uliege.be :

CV

List of publications

Motivation letter

One or two contact individuals from previous employer(s)

Contact information:

gabriel.mazzucchelli@uliege.be

Phone: +32 4 366.34.11