



Postdoctoral position in analytical chemistry

The “Biogeochemistry” group of the METIS laboratory (Sorbonne Université, Paris) and the Group of Mass Spectrometry at LCM (Ecole Polytechnique) have an opening for a post-doctoral fellowship. The aim is to develop a new method based on supercritical fluid chromatography coupled with high resolution tandem mass spectrometry for the analysis of organic molecules (glycerol ether lipids) used in (paleo)environmental studies. The position will start as soon as it is filled (ideally end of 2023) and is funded for 18 months. A summary of the project is provided below.

Investigating past climate variations is essential to understand and predict future environmental changes. Since no direct environmental measurements prior to the 19th century are available, our knowledge of past climate modifications is mainly based on the use of environmental proxies. Membrane lipids produced by certain microorganisms can be used to this aim.

Glycerol ethers of archaeal and bacterial origins have been the object of growing interest over the past twenty years because the structure of these membrane lipids was related to the temperature and pH of their source microorganism growth environment. The current reference method for the analysis of these compounds requires more than 2 hours per sample, i.e. two weeks of continuous analysis for a single sedimentary archive. The aim of this project will be to develop an innovative method for the analysis of glycerol ethers by supercritical fluid chromatography (SFC) coupled to a high-resolution tandem mass spectrometer (quadrupole time-of-flight (Q-TOF) type) and ion mobility-MS (timsTOF). This new methodology will allow to drastically reduce the analysis time of these compounds by a factor of 3 to 4 and to obtain a complete profiling of the complex isomer mixtures of glycerol ethers present in natural samples (microbial biomass, soils, sediments, etc.) due to high sensitivity. This fast, sensitive and cost-effective method will benefit to the entire international community achieving detailed analysis of glycerol ethers, which are still, to date, the only microbial proxies available for paleoclimate reconstructions in both terrestrial and aquatic environments.

This work will be based on a multidisciplinary approach, combining analytical chemistry, organic geochemistry and environmental sciences.

Required qualifications:

- PhD in analytical chemistry with demonstrated skills in method development.
- Basic knowledge and interest in organic geochemistry.
- Interest in environmental sciences.
- Demonstrated record of presenting and publishing research results.

For more information about this position, please contact **Dr. Arnaud Huguet** (arnaud.huguet@sorbonne-universite.fr) or **Dr. David Touboul** (david.touboul@cnrs.fr).

Applications should include a detailed CV, a cover letter and at least two recommendation letters before the 15th of November 2023.