



POST-DOCTORAL POSITION

Nanoplastics: from their physico-chemical characterization to the study of their interactions with environmental and biological media in an all-in-one microchip electrophoresis

Host laboratory

SEISAD Team, Institute of Chemistry for Life and Health Sciences
UMR CNRS 8060
Chimie ParisTech, Université PSL
11, rue Pierre et Marie Curie, 75005 Paris, France

Deadlines

Application must be sent before may 15th 2024.

Type of offer: Post-doctoral fellow 12 months, financed by Institut Pierre Gilles de Gennes pour la microfluidique (IPGG), to start before : december 2024

Context and project description

Society generates huge amounts of plastics, which are still under-recycled. In addition to their visible environmental impact (such as the seventh continent), plastics degrade into micro- and nano-plastics polluting throughout their life cycle. Nanoplastics (NPTs) have not yet been studied to any great extent, being the subject of much debate for their ubiquity, bioavailability and eventual high toxicity for biota and human being mainly due to their potential to cross biological membranes.

We aim at developing methods for better characterizing these NPTs, as well as for studying their interactions with environmental and biological media, in order to better understand their dispersion in environment, their role as environmental pollutant vectors as well as their impact on health. Taking into account their low concentration and their small size, the project aims at developing an all-in-one microfluidic platform for full characterization of NPTs in terms of intrinsic physico-chemical properties, interactions with their environment, toxicity.... This deep understanding will help anticipate environmental fate of NPTs but also develop pollution control and decontamination methods.

The post-doc tasks within this project will mainly concern the development of the microchip and the integration of an efficient detector, compatible with NPTs. Then the pre-treatment (if necessary), separation and detection of the NPTs will be designed and

implemented in this microchip. Electrokinetic methodologies for characterization and interaction studies will be then developed.

The SEISAD team, member of the Institut Pierre Gilles de Gennes pour la microfluidique (IPGG), benefits from all the facilities at IPGG for microfabrication.

Responsibilities

- Designing, developing, and implementing a novel microfluidic platform for the detection of nanoplastics (design, microfabrication, testing and validation).
- Performing experiments in environmental/clinical settings (river water/biologic fluids samples).
- Writing of protocols and support documentation, data analysis, interpretation and identification of technology limitations and troubleshooting.
- Results' presentation and publication.
- Supporting lab's organization.

Candidate profile

We are looking for an outstanding and highly motivated PhD in analytical chemistry, physical chemistry, nanotechnologies or nanosciences, that has an expertise in microfabrication along with good knowledge in separation sciences.

In addition, we are expecting good communication skills to work within a team, independence, good organizational skills and a high level written and oral communication skills.

Selection process

The applicant should provide a CV, a cover letter, and the coordinates of 2 scientific managers who can be contacted, to Pr Anne Varenne (anne.varenne@chimieparistech.spl.eu) by email. After a preselection, interviews will be organized.