Cluster WATER – CIRSEE – SUEZ – Le Pecq (France)

Le Pecq, March 29, 2019

POST-DOCTORAL POSITION

Subject

Development of non-targeted screening methodology and evaluation of its applications on the monitoring of drinking water treatment facilities

Context

The disruption of non-targeted screening approaches opens new opportunities in environmental analytical chemistry. New high-resolution mass spectrometry techniques allow analytical chemists to reach new scientific challenges involving, nevertheless, the development of specific for workflows. Its applications on water analysis and monitoring will allow the generation of high relevant datasets and the access to a new type of information: new tracers and indicators of efficiency of water treatment processes.

The application of non-target screening implies a complete change in paradigm regarding usual laboratory practices for method development and optimization (sample preparation, analytical method, quality control and insurance, data analysis and statistical tests…); the challenge being the generation the most global and the less specific chemical fingerprints of water samples.

Nowadays, the use of non-targeted screening approaches could represent a great revolution for the monitoring of water resources quality and for the management of treatment facilities efficiency.

Objectives of the research project

The main objective of the project is to develop the methodology of non-targeted screening in the main research center of SUEZ and to evaluate its applications for the monitoring of some specific drinking water treatment processes. The final goal is its application to SUEZ Group's treatment plants and its inclusion of this innovative methodology in future bid-to-tenders. The results of the project will be presented in front of the main scientific actors of SUEZ Group but also by their publication in scientific journals and/or by their presentation in national and international conferences.

Job's description

Postdoctoral researcher will contribute to the development and the validation of analytical methodologies in order to answer new challenges for the clients of SUEZ. His/her main activity will be the development of non-targeted screening methodology (suspected and non-targeted) and to apply it for the monitoring of water treatment facilities in drinking water production plants and for the water quality control of resources and drinking water. For this purpose, postdoctoral researcher will optimize all parameters of analytical methods: extraction conditions, chromatographic conditions, ionization and detection parameters, data analysis. He/She will evaluate the final methodology on real samples collected in SUEZ facilities: resources, treated water and various waters produced by several processes.

Analytical methodology will be developed using UPLC-HRMS system (Orbitrap, QExactive, ThermoFisher). Sample preparation procedure will be based on solid phase extraction but some innovative techniques could also be tested.

The main tasks and activities of the postdoctoral researcher will be:
- Finding the best conditions of all parameters and defining the non-targeted screening methodology (from sampling to data analysis) that will be applied in several projects of SUEZ.
- Selecting, together with treatment experts from SUEZ, resources, unitary treatment processes and drinking water treatment plants where the methodology could be evaluated.
- Organizing and coordinating sampling campaigns.
- Performing analysis on real samples.
- Developing and evaluating new data analysis approaches with datasets, with the support of SUEZ Digital Hub experts.
- Developing MS spectra database for SUEZ laboratory by including relevant compounds for water analysis (suspect screening).
- Presenting the results of the project in national and international conferences and conducting the writing of, at least, 2 scientific articles.

Required profile

Diploma	PhD in environmental analytical chemistry
Level of experience	Three to five years (including PhD work)
Skills	Theoretical and practical skills of analytical equipment and methods for the analysis of organic micropollutants – Environmental samples preparation – LC-HRMS and LC-MS/MS analysis
Software	Office, specific softwares for HRMS data analysis (R or Matlab) will be appreciated
Languages	English: basic knowledge ☐ fluent ☒ bilingual ☐

Other skills:
Scientific rigour, critical mind, autonomy, dynamism, perseverance. Good abilities to write scientific documents, to work as team, to propose solutions.

Working place:

Integration in Water and chemical fingerprint Division at CIRSEE, SUEZ, 38 rue du Président Wilson 78230 Le Pecq, France

Management:

All activities will be under the supervision of Amélie Guillon, project manager, and perform in the Water and Chemical Fingerprint Division supervised by Mar Esperanza.

Contact details:

Amélie GUILLON, PhD – Project manager – Analytical Chemist
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Mar ESPERANZA, PhD – Manager of Water and Chemical Fingerprint Division
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Contract duration:

18 months
Beginning: May 2019 regarding availability

Contract:

Fixed-term contract

Salary:

To be defined with Human Resources Division