PhD position

A 36 months' PhD position is available at LABERCA (UMR1329 Oniris-INRAE, Nantes, France) in the frame of the PARC project (Partnership for Assessment of Risk of Chemicals, EU Horizon EU Cofund, 2022-2029, https://www.eu-parc.eu/).

Innovative sampling and suspect/non-targeted screening methods for exploring human perinatal exposure to chemicals of emerging concern.

Background

Conventional sampling and targeted quantitative methods dedicated to chemical analyses are available to support environmental, food and human monitoring, risk assessment, and risk management decisions. However, these approaches sometimes still suffer from a lack of sensitivity to characterize lowest exposed populations, a lack of feasibility for large population studies, and importantly only capture a limited number of a priori known and selected markers of exposure. Capturing the complex real human chemical exposome requires new conceptual frameworks and innovative methodological approaches, built on the latest generation of cutting-edge instrumentation that open the door to more rapid, high throughput, and holistic marker's detection and identification. Combining innovative sampling (dry bloodspot, silicone wristbands) and/or biological matrices (cord blood, placenta, meconium…) with suspect and non-targeted screening approaches based on high resolution mass spectrometry (HRMS) today appear as promising methodological alternatives to widen our knowledge of the human chemical exposome. As formulated by several agencies (e.g. EFSA), early stage human exposure appears in particular as a high concern not yet well addressed, both in terms of risk assessment and link to health impact at latest stages (DoHAD concept). The aim of this project is to develop and conduct a proof-of-concept permitting to assess the performances, and illustrate the usefulness, of those innovative methods, as complementary to conventional and targeted approaches, with a focus on human samples collected from mother-newborn/child individuals.

Objectives

In this context, a research project is open for a Ph.D. candidate. This project aims to develop innovative analytical strategies focusing on perinatal exposure profiling via multidimensional and high-resolution mass spectrometry coupled with different types of chromatographic separations (LC-Q-Exactive/LC-Q-TOF/GC-Q-Exactive).

The Ph.D. student's research work will thus consist of sample preparation, data generation, data analysis, and treatment to gain access to the characterization of the chemical exposure of individuals (Exposomics). Moreover, an additional part will be dedicated to evaluating the new sampling methods and comparing them to more invasive conventional techniques.

This Ph.D. project is a part of a large European consortium on chemical exposure (PARC project "Partnership for Assessment of Risk of Chemicals", EU Horizon EU Cofund, 2022-2029, https://www.eu-parc.eu/) – assembling more than 200 institutions from 28 countries. This consortium will offer the candidate a large networking and international experience.

Supervisors
Dr. Jean-Philippe ANTIGNAC
Dr. Tarek MOUFAWAD

Qualifications
We are looking for a highly motivated scientist with a master degree in characterization of human exposure to chemicals. In detail, the candidate is expected to possess:

- Strong chemical background with a M.Sc. in Chemistry, Chemical Engineering, Analytical Chemistry or equivalent
- Hands on experience with analytical method development and advanced data analysis within chromatography and mass spectrometry (multidimensional and/or high resolution MS) workflows
- Experience or knowledge about one or more of the following areas will be an advantage:
    - Chemical contaminants
    - Exposomics
    - Multivariate data analysis
- Good laboratory skills
- Good collaboration and communication skills (written and spoken English)
- Structured and analytical working approach

Salary
The period of employment is 3 year, gross salary of 2044.12 €/month.

Application

Applications must be submitted to jean-philippe.antignac@oniris-nantes.fr and tarek.moufawad@oniris-nantes.fr as **one pdf file** containing all materials to be given consideration. The file must include:

- A covering letter
- A *curriculum vitae*
- Supporting letters

You can read more about LABERCA on www.laberca.org. LABERCA's general domain of activity is the chemical food safety, in a global risk assessment perspective: generation and interpretation of exposure and body burden data, study of the transfer and metabolism of investigated chemicals from their sources to the consumers through the food chain. From an analytical point of view, the two main areas of competence of the laboratory are the treatment of complex biological samples for isolating the studied substances present at (ultra-trace)- level, and the hyphenated measurement of these compounds by various mass spectrometric coupling techniques. Besides these targeted approaches, the laboratory has been developing over the last 10 years an expertise in untargeted approaches (metabolomics) to reveal biomarkers of chemical exposure. The analytical platform is considered as one of the most complete at the national and European level (> 20 last generation MS instruments). All these activities (assays and research) are conducted under management quality system combining accreditation (ISO 17025, ISO 17043) and certification (ISO 9001:2015).

The European Partnership for the Assessment of Risks from Chemicals (#EU_PARC) is one of the projects selected for funding by the European Union's "Horizon Europe" framework programme for the 2021-2027 period. Coordinated by ANSES, this major project is seeking to develop next-generation chemical risk assessment in order to protect health and the environment. The European Partnership for the Assessment of Risks from Chemicals aims to advance research, share knowledge and improve skills in chemical risk assessment. By doing so, it will

help support the European Union's Chemicals Strategy for Sustainability, paving the way for the "zero pollution" ambition announced in the European Green Deal. PARC represents a campaign of unprecedented scale, since it brings together about 200 French and European players, involving national and European health and safety agencies as well as research organisations. The partnership encompasses all aspects of chemical risk assessment, aiming in particular to: better anticipate emerging risks, better account for combined risks, and underpin the concrete implementation of new orientations in European public policies to safeguard health and the environment in response to important issues for health, the ecology and citizens' expectations. The partnership will build on work undertaken as part of the European Joint Programme on human biomonitoring, HBM4EU (Human Biomonitoring for Europe), which will come to an end in the summer of 2022, and will broaden the scope of its of interests specifically to the assessment of environmental risks. [European Partnership for the Assessment of Risks from Chemicals (PARC) | Anses - Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail]