Offered Post-doctoral position

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A 12 (+12) month post-doctoral position is available at LABERCA (UMR1329 Oniris-INRAE, Nantes, France) in the framework of the PARC project (Partnership for Assessment of Risk of Chemicals, EU Horizon EU Cofund, 2022-2029, https://www.eu-parc.eu/). The earliest possible date for taking up the post is 1st May 2023.

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Development and implementation of PBPK modelling tools for assessing lifespan human chemical body burden to real life mixture of organic and inorganic contaminants.

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Background

Food is one of the main sources of exposure to numerous contaminants for the general population. These contaminants are from different origins, some are anthropogenic (Flame retardants, plasticizers etc.), others are from the crust of the earth (heavy metals for example). These substances may be all found in non-trace concentrations in food (See results of total diet studies performed in France, Germany, UK etc.). Estimating the dietary exposure of the population (or sub populations) to these substances individually led, in some cases, to set maximum limits in food (Regulation EC 1881/2006 for PCBs, Cd, Pb etc.). Additionally, mixtures of contaminants are present in food and despite some proposed approaches to assess the risk due to such mixtures, risk assessors face difficulties to draw firm conclusions on the risk related to the mixtures. Other challenges associated with human risk assessment include the proper assessment of long-term chronic exposure, which involves taking into account not only exposure measurements at a given point in time, but also a sufficient number of measurements to reflect the exposure of individuals over their lifetime. We have previously shown that exposure to contaminants changes over a lifetime, highlighting the needs to assess the exposure and risk at different ages that take into account varying lifestyles, as well as socio-economic and environmental factors. This need appears especially for persistent contaminants accumulating in the body over time (e.g. heavy metals, POPs). In our previous and ongoing work, we have applied and confirmed the usefulness of PBPK modelling to reconstruct human internal exposure to individual organic contaminants (PCBs, BPA) or heavy metals (Cd) from external dietary exposure assessments over the life span. This approach is currently pursued to model exposure to mixtures of heavy metals over a lifetime taking into account the different interactions that can occur between them from both a kinetic and dynamic point of view.

Objectives

From this existing conceptual and methodological basis, the aim of the present project, envisaged over 2 years with a post-doctoral fellow, is to extend this PBPK modeling approach to even more complex real life chemical mixtures, combining both organic and inorganic contaminants. This extension better reflects the exposure patterns to which populations are really exposed. Based on the extended PBPK model, the project's overall objective is to estimate the lifetime exposure of the population to these mixtures and to perform a first risk assessment based on a chronic toxicological endpoint shared by

the different substances (developmental neurotoxicants for instance) of the mixture considered.

From this general objective, the project will focus more precisely on:

- Particular co-exposure patterns as observed in selected food items/habits, e.g. high levels of both heavy metals and POPs in biggest consumers of fatty fish.
- Specific sub-populations that are more vulnerable and / or over exposed, e.g. pregnant women…
- Particular health outcomes possibly associated to a given co-exposure, then used as a rationale for prioritizing the chemical mixture (based on external or internal exposures) in the envisaged PBPK modeling work.

Supervisors

Pf. Bruno LE BIZEC (Oniris)

Dr. Gilles RIVIERE (ANSES)

Qualifications

We are looking for a highly motivated scientist with a University PhD and advanced experience in toxicokinetics applied to the characterisation of human exposure to chemicals. More specifically, the candidate is expected to possess:

- A strong background in PBPK modeling;
- Knowledge in chemical risk assessment;
- Good toxicology skills;
- A strong interest for interactivity and interdisciplinary work;
- Excellent communication skills in French and in English.

Salary

The period of employment is 1 year, open for one additional year, gross salary 2875 €/month.

Application

Please submit your application before 30 March 2023**.**

Applications must be submitted to bruno.lebizec@oniris-nantes.fr and Gilles.RIVIERE@anses.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. https://www.anses.fr/en/content/european-partnership-assessment-risks-chemicals-parc