Unité de Recherche – UMR_S 1256

Nutrition Génétique et Exposition aux Risques Environnementaux

18-month post-doctoral position currently available (Unit NGERE, INSERM U1256, Nancy, France)

Assessment of the brain toxicity of exposure to mixtures of pollutants found in polluted sites and soils

Description of the structure of laboratory:
The person will be recruited within the NGERE (Nutrition Genetics and Exposure to Environmental Risks) laboratory (https://ngere.univ-lorraine.fr/), a joint research unit of the University of Lorraine and INSERM (U1256) whose research topics concern the study of interactions between genetics, epigenomics and metabolic and/or nutritional factors on normal or pathological aging. The role and impact of environmental factors on these mechanisms and the resulting pathologies are of concern within the research topics of the laboratory. Among these factors, the presence of chemical pollutants in the environment is one of the factors considered for human concerns, particularly in terms of consequences on the neurological and mental health of the individual.

Scientific context of the position:
The recruited person will have to work as a part of the BrainSol environmental neurotoxicology research program funded by ADEME and carried out in partnership with INERIS. The person will have to carry out a data mining concerning the neurotoxicity of pollutants from 3 families of chemical compounds (metals, organochlorine solvents and polycyclic aromatic hydrocarbons). More specifically, it will involve establishing a textual database for each of these 3 families, analyzing the data contained in these databases to establish a toxicological profile of the substances belonging to each family, and then constructing AOP (Adverse Outcome Pathway) formalisms to establish the link between the known or supposed mechanisms of action of these substances and the neurotoxic effects that they may generate. The ultimate goal of the work will be to bring the AOPs constructed for each substance closer to each other in order to identify possible mechanistic and therefore toxic interactions between several substances and families of pollutants. AOPs will be also considered in regards with exposure data concerning these pollutants to estimate the level of exposure at which the risk of triggering a toxic effect for the brain may exist. Finally, the resulting constructs will be applied to the estimation of neurotoxic risk in three different types of populations (adult, pregnant woman and young child).

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Tasks and required skills:

Under the supervision of the project leaders, the person will have 1) to build and validate a systematized methodology for textual data mining (publications, expert reports, conference, proceedings, databases, etc…) as well as a document quality assessment methodology to extract the data deemed relevant concerning the neurotoxic effects of the pollutants covered by the BrainSol research program, 2) to complete for each substance the existing toxicological profile in the INERIS database with the data available concerning the neurotoxicity of the substance and its potential effects on neurodevelopment, 3) to apply the AOP building methodology to each substance using the OECD AOP wiki database and building tools such as AOP-helpfinder, 4) to bring together the building AOPs to identify key stages (key events) within the AOPs which could be common to the different constructions so as to be able to establish an estimate of the neurotoxic risk that exposure to the mixture of these substances could represent, and 5) to correlate the validated AOPs with the results related to exposure obtained in the first part of the BrainSol project to establish a neurotoxic risk assessment methodology which would make it possible to move from a descriptive aspect constituted by the AOPs (qualitative AOPs) to a tool for estimating the level of exposure above which exposure to one or more substances could represent a risk for the brain (quantitative AOPs). The person required for this position will therefore be positioned at the intersection of the fields of neuroscience and brain development, toxicology related to the environment and data mining and modelling

This position is therefore intended for people with experience in the field of neurosciences and/or toxicology related to the environment. Experience in the field of data mining and modeling textual data applied to the assessment of risk to the brain from exposure to environmental pollutants will be appreciated.

Contract information:

- Dates and duration of the contract: as soon as possible for a period of 18 months
- Gross monthly salary: from 2271 Euros
- Job location: Faculty of Medicine, Vandoeuvre-les-Nancy

To apply:

CV, cover letter and copies of diplomas should be sent to Henri Schroeder, project leader within the NGERE unit, at the following address: henri.schroeder@univ-lorraine.fr and copy to caroline.reppert@univ-lorraine.fr