PhD studentship in metabolomics to characterize the human chemical exposome

French School of Public Health of Rennes (France)
Contract: 36 months
Closing date: 31 May 2018

The French School of Public Health, a member of the University Sorbonne-Paris Cité (http://www.sorbonne-paris-cite.fr/), seeks highly qualified candidates for a PhD position to work in the field of metabolomics/exposomics. The Exposome represents all environmental exposures from conception onwards and includes broad categories of exposure, e.g. pollutant exposure, gut microflora, diet, lifestyle factors, and encompasses the wider social, economic and psychological influences. This new concept has recently emerged to study the increasing prevalence of human non communicable diseases (e.g, cancer, metabolic disorders, obesity, reproductive disorders), a major cause of mortality worldwide. The chemical exposome represents a key fraction of the whole exposome and includes components of both external (e.g. environmental pollutants and drugs) and internal (e.g. endogenous metabolites) exposures. Untargeted profiling analytical methods based on liquid chromatography high resolution mass spectrometry (LC-HRMS) combined with chemometric pattern recognition offer exciting perspective to characterize the chemical exposome since these untargeted techniques allow to identify without *a priori* contaminant mixtures accumulating in humans and simultaneously investigate for any associated disruption of endogenous metabolite profiles. However, most of the current metabolite profiling methods are not sensitive enough to detect trace levels of contaminants, endocrine or other signaling compounds present in tissues or plasma extracts. The main objective of the PhD will be to develop highly sensitive and robust untargeted analytical methods and UHPLC-ESI-TOFMS methods to profile biological matrices such as blood plasma and urine. The new analytical methodologies will then be applied on blood/urine samples from mother-child cohort studies to study potential association between exposure and health outcomes.

We seek a highly motivated and enthusiastic candidate with a master in the area of metabolomics, environmental chemistry, or analytical chemistry with experience and demonstrated success of working independently and as part of a team in analytical or academic research facility. The successful applicant will work at the Laboratory for Research and Study in Environment and Health (LERES), a major analytical platform fully integrated within IRSET-Inserm U1085. Essential skills for this job include experience in biological sample preparation techniques, strong practical expertise in liquid chromatographic methods, LC-HRMS based metabolomics and experience in metabolite deconvolution software and Mass Spectral Database.

The successful applicant will also have to develop and implement a data processing pipeline including experimental design, pre-processing (bioinformatics), and statistical analysis of large scale LC-MS based metabolomics studies. Experience with computer programming (e.g., R, Matlab) and multivariate statistics (e.g., SIMCA) would be highly advantageous for this job. The position will include collaborations with epidemiologists, toxicologists and developmental biologist within the Research Institute for Environmental and Occupational Health (Irset-Inserm UMR 1085) and Rigshospitalet (Copenhagen, Denmark). Effective communication skills, both oral and written is required.

The successful candidate is expected to start in September 2018. The closing date for applications is 31 May 2018. Applicants are invited to email their application including CV, an application letter, diploma and a list of 2-3 referees to Dr Arthur David (arthur.david@ehesp.fr). Interested applicants can email Dr Arthur David for further information.