HUMAN EXPOSURE AND TIERED RISK ASSESSMENT (HETRA)

Request for Proposals (RfP) - Draft 20 May, revised 16 June 2011

Title: Representativeness of single human biomonitoring samples

Project code number: LRI-HBM4

LRI strategic research area

Acceptance of new technologies & products

Background

Continuously increasing analytical capabilities have led to a substantial upsurge of human biomonitoring (HBM). Several national and international programmes have been running or are in progress. A well-managed and highly influential HBM programme is the National Health and Nutrition Examination Survey (NHANES) in the USA. In this programme, a single urine and blood sample is collected from a sample of the USA population and analysed for a wide range of substances. In the EU, the GerES (German Environmental Survey) has followed a similar approach for the German population. Currently, the COPHES (Consortium to Perform Human biomonitoring on a European Scale) is being rolled out in 25 EU Member States with a similar setup, but with a focus on mother-child pairs. The feasibility of the COPHES programme is currently tested in the DEMOCOPHES programme.

The general aim of these HBM programmes is the collection of data on human exposure to chemicals. One of the underlying hypotheses of these extensive HBM programmes is that a single sample of blood or urine can be considered to be representative for the general exposure situation. In many instances, the HBM results of these surveys are correlated with disease occurrence to explore potential associations between exposure to a chemical and the prevalence of disease. These correlations are only valid though if the single human sample reflects exposure over a longer period, within the time frame relevant for the induction of the disease outcome. However, the representativeness of single samples to assess (average) exposure is lacking.

Objectives

The objective of the project is to investigate the representativeness of single blood or urine specimens for a longer exposure period. This information can, for example, be obtained from multiple HBM data collected from the same individuals over a longer time span. Alternatively, this information can be predicted using toxicokinetic models and subsequently validated in field studies or using historical data. If a single sample is indeed representative, the within subject variation should be small in relation to the between subject variation.

Scope

It is anticipated that this project will be conducted in a structured manner to ensure regular delivery and review against milestones. It is expected that modelled data are appropriately validated and an applicability domain is well defined. It is also encouraged that the modelled results are verified using existing or newly generated HBM data on relevant synthetic chemicals (to be determined).

It is encouraged that the results will be published in the peer-reviewed literature, ideally following a process that involves stakeholder discussion and presentation at a suitable scientific conference(s).

Monitoring

The principal investigator will be required to submit a progress report at six-monthly intervals and a detailed review of the results at the end of the project. It is expected that the results will be published in peer-reviewed journals, and the investigators are encouraged to present their preliminary findings at appropriate scientific meetings.

Cost & Timing

100-225 k€ (depending on whether field studies are required) over a period of 2-3 years.