Laboratory of Analytical Human Biomonitoring (LAHB)

Competences

Main axes of research

The goal of the research unit is to develop biomarkers for the identification of human exposure to pollutants and to understand the relationships between exposure and subsequent biological/biochemical disorders.

The development of biomarkers includes research in analytical chemistry using state-of-the-art equipment (mainly based on mass spectrometry) necessary to reach low levels of molecules present in biological matrices. In order to understand the relationships between the level of exposure and the concentration of molecules in human matrices, we also work on metabolism and incorporation mechanisms of molecules and metabolites in matrices. Disorders associated with exposure are investigated through the analysis of specimens from selected human volunteers and experimentation on animals under controlled exposure. The advances obtained are valorised through epidemiological studies involving extended cohorts in order to determine the reference levels of biomarkers for the general population and to identify over-exposed sub-population.

Application domains

Development in analytical toxicology and application to human biomonitoring and therapeutic drug monitoring

Current research projects

- **Assessment of human exposure to organic pollutants using hair analysis**: Hair as a matrix for human biomonitoring (HBM) presents several advantages over classical matrices. The project aims to investigate the usefulness of hair for HBM of exposure to organic pollutants, with a focus on polycyclic aromatic hydrocarbons (PAHs) and pesticides. The project includes analytical development based on gas and liquid chromatography coupled with tandem mass spectrometry.

- **Hair analysis for the assessment of children exposure to indoor pesticides**: Reports detected high levels of biocides in indoor atmosphere in schools. Children are often more sensitive to health issues associated with exposure to pesticides. The project aims at developing analytical methodologies for the determination of selected compounds (including organochlorinated, phosphorilated compounds, pyrethrinoids and polychlorophenols) in different biological matrices and applying the methodologies to the analysis of specimens from a cohort of French children.

- **Nutrition, environment and cardio-vascular health**: The Centre of Health Studies (CRP-
Santé) initiated a project aimed at assessing different parameters potentially associated with cardiovascular diseases among more than 3000 volunteers. The laboratory of toxicology is in charge of investigating the volunteers’ alcohol consumption, smoking habits and exposure to polycyclic aromatic hydrocarbons and pesticides as representatives of environmental and occupational exposure.

**Area of competence**

- Life Sciences, health and biotechnology

**Technology keywords**

- Toxicology

**Contact details**

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**Resources and Collaboration**

**Equipment**

Gas chromatography tandem mass spectrometry

**Products and services**

Information not available

**Major Partnerships and collaborations**

**National:** CRP-Santé - Centre d’Etudes en Santé (Resp. M.L. Lair, S. Couffignal MD, A. Alkerwi, MD); Institut Vitivinicole, Remich

**International:** Centre de Géochimie de la Surface de Strasbourg, UMR 7517 CNRS – Université Louis Pasteur. (Pr Millet M.) (FR); Agence Française de la Sécurité Sanitaire de l’Environnement et du Travail (AFSSET) (FR); Unité de Recherche Animale et Fonctionnalité des Produits Animaux (URAFPA), USC 340 – Institut National Polytechnique de Lorraine, Nancy (FR)

**Human resources**

Researchers (prof., ass. Prof., post-docs, PhD): 3
Doctoral students and students: 1
Engineers: 0
Technicians: 1
Other: 0

**R&D Contact Person**

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