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Exposure Science Sector  
Toxicology and Biomonitoring Unit  
[www.unisante.ch](http://www.unisante.ch)

Research group: Human Biological Monitoring (HBM) and Exposure Assessment

Uniscience website: [Nancy Hopf Professeure associée - Unisanté - \(UNIL\)](#)

Leader: HOPF Nancy

The group's research focuses on assessing exposure to substances likely to have harmful effects on human health. The group develops new biomonitoring methods based on toxicokinetic parameters after inhalation and skin exposures. We use an exposure chamber exposing human participants to controlled air concentrations and duration to assess internal exposure (dose) after inhalation, while we measure skin absorption and skin irritation using flow-through skin permeation experiments with human skin obtained as surgical waste (abdominoplasty).

Once toxicokinetics have been established for the substance of interest, the group uses these new exposure biomarkers, mainly metabolites, to assess individual exposure in a given population. Biomonitoring is the preferred exposure assessment because it considers all routes of entry: inhalation, skin absorption and ingestion from all sources (air, water, work and home environment). Biomonitoring is also an effective method for assessing exposures in large population studies, as it can be as simple as collecting a urine sample.

The research group uses biomarkers of effects, which measure biochemical changes due to chronic exposures, such as micronuclei (MN). MN frequency is a measure of DNA damage at the chromosome level, and a measure of chronic carcinogenic exposures. Monitoring this biomarker of effect can alert the occupational hygienist and occupational physician to the presence of high exposures to genotoxic agents and the need to remedy them.

The SUR student will be able to participate in ongoing studies.