

## Hypothesis, aims and objectives

### Hypothesis

The general population is exposed to different air toxics emitted from outdoor and indoor combustion sources (e.g. traffic, ETS, space heating) and indoor sources such as consumer products and building materials.

Doses of inhaled air toxics are metabolised producing several biomarkers of exposure and metabolism profiles that can be detected in the urine even at low levels of exposure.

### Aims

This study aims to a) characterise human exposures to a range of air toxics emitted from consumer products and combustion sources; and b) to find suitable biomarkers to monitor the exposure and effects to low-level of VOCs, especially benzene, and other air toxics using novel analytical and cutting-edge methodologies.

### Objectives

The objectives of the current proposal are:

- Characterize personal exposures to a common range of chemicals widely used in consumer products and building materials such as VOCs as well as to air toxics mainly linked with combustion sources, such as PM2.5, PAH, quinones and BC.
- Characterize concentration of VOCs, PM2.5, PAHs, quinones and BC in relevant indoor microenvironments (i.e. home and workplace) which are expected to have high impact in exposure and inhalation dose.
- Develop models to predict inhalation doses and personal exposures to VOCs, PM2.5, PAH, quinones and BC using a range of microenvironment concentrations and subject information (e.g. exertion level, age, gender).
- Assess the contribution of specific microenvironments and events to personal exposures and lung doses of the abovementioned pollutants.
- Characterize urinary biomarkers of exposure which can be linked to low-level inhalation of VOCs.
- Study new biomarkers of exposure/effect to VOCs, PM2.5, PAH, quinones and BC using metabolomic techniques.