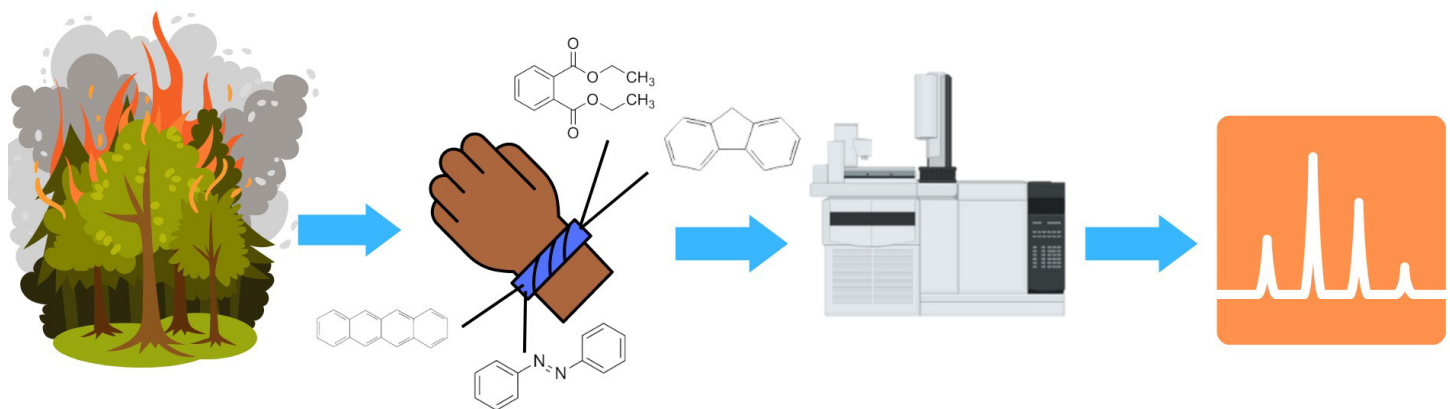


# Tracking Environmental Toxins from the 2023 Canadian WildFire with Silicone Wristbands

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Research has shown that environmental pollutants found in the air can have significant adverse health effects, some include disruption in the endocrine system, complications with reproduction, and cancer. Such classes of pollutants - polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), organochlorinated pesticides (OCP), and organophosphate esters (OPEs) are ubiquitous in modern infrastructure, comprising a measurable fraction of our environmental contaminant exposures. Past research methods for estimating exposure include hand wipes, blood/urine testing, and solid-phase micro-extraction (SPME) fiber. Our aim is to use silicone wristbands to test their effectiveness in detecting exposure to different air pollutants from the 2023 Canadian forest fire. Wristbands were placed on the third-floor EOHSI patio for 4 days. Some wristbands were exposed for half the day and others for 24 hours. The exposed wristbands were extracted using methylene chloride and ethyl acetate (1:1 v:v) and evaporated under nitrogen. An Agilent Technologies 240 Ion Trap gas chromatography-mass spectrometer was used to analyze the samples. The SWBs were able to detect different classes of toxic compounds. Tentatively identified compounds (TICs), were fluorene, benzyl butyl phthalate, naphthacene, and diethyl phthalate. Knowing that the wristbands are able to effectively track one's everyday exposure, they can be used for people in different occupational settings, especially for people who are at a higher risk of being exposed such as pregnant women, children, firefighters, or a farmer. In the future human participants will wear wristbands to track their everyday exposure.



2023 Canadian forest fire smoke traveled to New Jersey

Using silicone wristbands to track toxic vapor phase environmental contaminants

Agilent Technologies 240 Ion Trap gas chromatography used to analyze the samples from extracted wristbands

Chromatography analyzed and compounds were identified