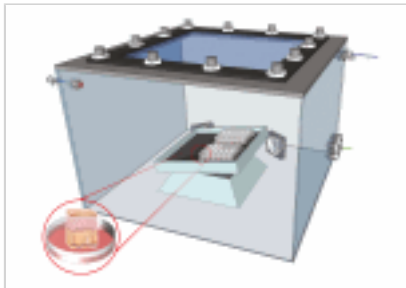


The impact of indoor air pollution on skin



IPREM researchers have developed a system in which skin cells and biopsies can be exposed to a mixture of volatile organic compounds representative of indoor air pollution.

The quality of outdoor air has been the subject of many studies. But very little is known about indoor air pollution. A shortcoming when you know we spend 85% of our time in closed environments containing a whole host of pollutants, in particular volatile organic compounds (VOC).

Present in gaseous form in the air, these organic chemical molecules are emitted by many different sources such as construction materials, furniture, heating, etc. Aware of the health issues, four researchers of the IPREM, in association with the functional genomics institute of Lyon and *LVMH Recherche* decided to launch a research project in 2015 designed to precisely measure the impact of indoor air pollution on skin.*

Sylvie Lacombe and Mikael Le Béchech first developed a sealed chamber in order to simulate an indoor atmosphere polluted by a cocktail of VOC (acetaldehyde, formaldehyde, acetone, hexane and toluene).

A complex analytical system, since the composition of the gaseous mixture had to reproduce chronic exposure while remaining compatible with the survival of cultured skin cells and skin biopsies introduced into the assembly. The scientists then measured the cellular and molecular responses.

Although the data have not yet all been studied in detail, the first results taking shape are rather worrying. Exposure to VOC particularly affects the survival of keratinocytes and skin cells.

In addition, repeated exposure to these pollutants significantly affects the cell protein elimination process, induces oxidative stress causing damage to DNA and proteins and also impairs mitochondrial respiration. An important discovery since protein oxidation is one of the main causes of cellular aging and associated diseases.

**Oxidative damage and impairment of protein quality control systems in keratinocytes exposed to a volatile organic compounds cocktail.* Scientific Reports 7, Article number: 10707 (2017)
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 mickael.lebechec@univ-pau.fr