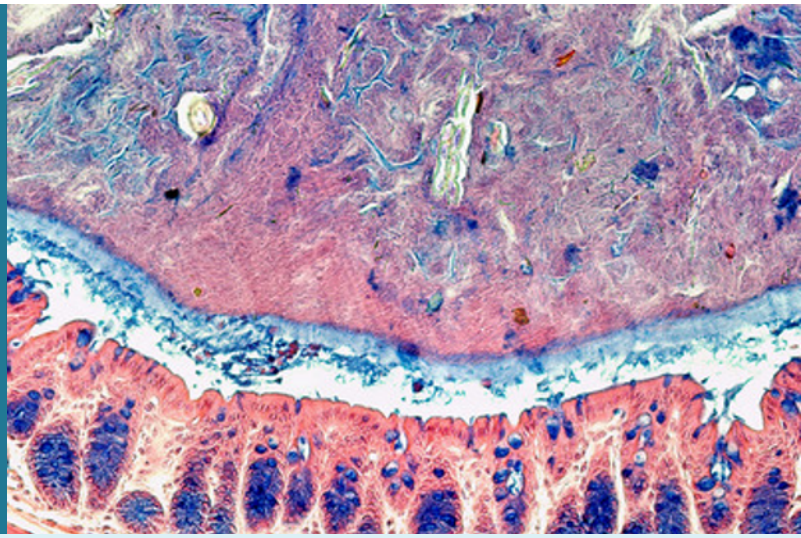
PROJECT FACTSHEET

www.list.lu/en/research/project/fluo-gut-1/?no_cache=1&cHash=72be588afbcff736dfb99148dbb0cade

FLUO-GUT

Development of Correlative Microscopy methods for toxicant location at cellular and subcellular level



INSPIRATION

Perfluoroalkylated substances (PFASs), such as perfluorooctanoic acid (PFOA), have been widely used for many industrial purposes and consumer-related applications. Consequently, these compounds are omnipresent in our environment.
In humans, dietary intake is the main route of exposure to PFASs. The gastrointestinal tract is thus the first physical and biological barrier against these emerging environmental pollutants, and meanwhile their first target. Surprisingly, their effect on the intestinal wall is largely unknown. Hence, there is a need to expand research within the field of gut toxicity of PFOA and its fluorotelomer alcohol precursor 8:2 FTOH. In addition, the impact on the intestinal wall of chronic psychological stress, a major environmental factor in modern-days society, is also unknown.

INNOVATION

The FLUO-GUT project is focused on investigating, *in vitro* and *in vivo*, the consequences of PFOA and 8:2 FTOH exposure on an intact vs. stress-impaired intestinal barrier to reveal any cumulative effects. Intestinal barrier will be analysed at its luminal side through the epithelium/mucus/microbiota triad, the interactions of which have been poorly explored, in particular when facing chemical stress.
ToxAlim will evaluate kinetics/intensity of uptake and metabolization, and resulting toxicity effects through a thorough description over a large range of relevant biological endpoints under intact vs. compromised gut barrier function.
LIST will develop correlative imaging methodologies to achieve a breakthrough in the knowledge of PFOA/8:2 FTOH uptake and metabolization at cellular and subcellular level. For this purpose, light and electron microscopy (LM & EM), which reveal inner morphology of the specimen, will be correlated with mass spectrometry (MS), which provides analytical information.

IMPACT

The development and added-value of unique correlative imaging methods, combined with know-how transfer from Luxembourg to France, will open new opportunities in food toxicology and life sciences in general. Beyond PFASs, FLUO-GUT will serve as a blueprint for deciphering gut- and gut/liver axis-targeted toxicity of other environmental pollutants in “sensitized” human populations. FLUO-GUT project will thus provide an important foundation for safe and sustainable food in modern-day society.

Partners
ToxAlim (FR) , IPREM (FR)

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