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PRESS RELEASE

Chemical exposome: the French School of Public Health develops and releases the Scannotation open access software

This software, developed by a team from the Department of Environmental Health Sciences (EHESP), aims to improve our knowledge on human exposure to environmental chemicals (e.g., pesticides, plasticizers, personal care products). More precisely, Scannotation is an automated and user-friendly suspect screening tool for the rapid pre-annotation of complex high-resolution mass spectrometry data based on a library of suspects (6,000 chemical compounds at present). The so-called "suspects" are chemical substances with potential toxic activities that can accumulate in human biofluids (e.g., blood or urine) from environmental sources. Hence the objective of our research is to provide a more comprehensive characterisation of the human chemical "exposome" – the exposome is defined as "all the environmental factors to which humans are exposed, from their conception to their death, as well as all the "interaction between the individual's own characteristics (their genotype and phenotype) and their environment" (https://doi.org/10.1158/1055-9965.EPI-05-0456). To this end, we use non-targeted approaches (i.e. without further *a priori*). The library of compounds is scalable and regularly updated in the software. This data processing software developed by EHESP will be used in our future chemical exposome research projects, including the European PARC project coordinated by ANSES which aims to improve human biomonitoring and chemical risk assessment.

The latest version of Scannotation includes a graphical user interface and is now available and open access at: https://github.com/scannotation. It can be used by the scientific community, particularly teams involved in the field of biomonitoring or in environmental risk assessment. An article based on the development of Scannotation has just been published in the scientific journal "Environmental Science & Technology" (https://doi.org/10.1021/acs.est.3c04764).

A video presenting Scannotation is also available at this address: https://youtu.be/RF5Mb7Hl5E0?si=gi4jZumo5ehkGkXs.

This software is part of the environmental health research axis of the 2019-2023 strategic establishment plan of EHESP, as well as the research axes of the Environment and Health Design and Research Laboratory (Leres) and the Life Course Epidemiology and Exposure Science for Environmental Health (Elixir) team of the Research Institute for Environmental and Occupational Health (Irset).

This tool will also serve the France Exposome Research Infrastructure (https://www.france-

exposome.org/en) and the European research infrastructure (EIRENE) to help the processing of non-targeted data generated using cutting edge high-resolution mass spectrometry instruments.

Its development was initiated during the EHESP/Université Sorbonne Paris Cité research chair (Idex funding / 2016-2019) held by Arthur David, professor at EHESP. The developments were carried out by Erwann Gilles (Bio-informatics engineer of Leres) and Jade Chaker (now post-doctoral student at Leres) during her PhD supervised by Arthur David, as well as with the contribution of Sarah Lennon (Lecturer at University of Rennes). This software will be upgraded with significant advances in the years to come.