ABSTRACT BREAK OUT SESSION - TUESDAY 26TH JANUARY 2021

2 - Computational and predictive methods for risk assessment: issues and promises

David Demortain (LISIS), chairman, Frédéric Bois (CERTARA), Kathryn Guyton (IARC), Jean-Lou Dorne (EFSA), Anax Oliveira (LHASA Limited)

Over the last ten years, risk assessment has witnessed a reorientation towards predictive methods. The National Research Council report on Toxicity Testing in the 21st Century thus marked the ambition to anticipate risks with greater accuracy, thanks to a combination of technological developments: the availability and volume of data afforded through the application of -omic techniques; progress in systems biology and mechanistic knowledge, as well as computing power, allowing to develop and simulate high-quality models; in recent recent years, the fast development of machine learning methods enabling to learn from vast amounts of data, in an unsupervised fashion. As the Toxicity Testing in the 21st Century report shows, these developments carried, and still carry great promises for risk assessment. In hindsight, however, they also have pitfalls, and problems. Computational methods appear less transparent and accessible to reviewers of risk assessment than experimental methods. Relying on models and simulations, for instance, implies a trust in the quality of input data, in the quality of the biological knowledge put at the heart of the model, and so on. How well do these elements circulate? How open are they to review, evaluation and auditing? To what extent does computational expertise allow for the development of a counter-expertise? This session will be dedicated to the discussion of these developments and concrete applications in risk assessment, their risks and continuous promises. It will be the occasion to review and discussion more recent developments surrounding data- and model-oriented risk assessment: is the current drive towards the development of new systems for data sharing a possible solution to limit the risks of depending on "black-boxes" for predicting risks? How are these risks and promises taken into consideration in the current drive towards the application of machine learning methods, also?