

Press release:

"Transforming Chemical Safety: PrecisionTox Leads the Change"

The PrecisionTox consortium held its third annual meeting in Brussels on June 13-14. The gathering brought together leading scientists and legal experts from Europe and North America, who are all committed to enhancing human health and protecting the environment from toxic substances. PrecisionTox is an innovative European Commission funded project to transform regulatory toxicology.

At the heart of PrecisionTox is the concept of “toxicity by descent”, which uses evolutionary principles to understand the origins of toxicity shared among distantly related animals, including humans. This approach suggests that animals share similar responses to chemicals due to their common evolutionary history, thereby facilitating the use of alternative species to predict the toxicity of chemicals other than mammals. PrecisionTox researchers are employing cutting-edge techniques like transcriptomics, metabolomics, quantitative genetics, data science, and comparative toxicology to discover the common molecular pathways to toxicity among five biomedical model organisms from multiple branches of the tree of life, such as fruit flies, water fleas, nematodes and the embryos of fish and frogs, to predict chemicals adverse effects as a new standard in chemical safety assessment. The ultimate objective is to accelerate the acceptance of New Approach Methods (NAMs) – methods that replace traditional animal testing - for regulatory purposes.

Despite significant technological advancements, the adoption of novel methods by stakeholders and regulators remains a challenge. A PrecisionTox report on the barriers to the uptake of NAMs reveals the complex landscape: confidence in NAMs among regulators and industry representatives is still low, legal uncertainties persist, and traditional animal testing methods, despite their flaws, are deeply ingrained. The report underscores the need for increased education, training, and resource availability to support the successful adoption of NAMs.

To achieve their ambitious goals, PrecisionTox partners are fostering strong cooperation with stakeholders, including regulators, industry, and NGOs. The consortium has joined forces with two other EU-funded projects, ONTOX and RISK-HUNT3R, under the ASPIS cluster. Together, they represent a €60 million EU investment in advancing next-generation risk assessment methods that do not rely on traditional animal testing. Many ASPIS partners are also involved in PARC, the European Partnership for the Assessment of Risks from Chemicals, a welcome synergy that will support the knowledge transfer and close dialogue with regulators. ASPIS and PARC are contributing to the development of the roadmap for phasing out animal testing in chemical safety assessments, an initiative that is led by the European Commission.

Since PrecisionTox launched in 2021, the 15 partners have achieved notable milestones and are eager to showcase the results from investigations on evolutionary toxicology's validity. They have produced around 20 scientific publications, developed a unique chemicals library containing 250 substances with relevant toxicity and biomarker information, and are collaborating with EU regulators on case studies. Until the completion of the project in 2026, the consortium will continue with chemical testing on biomedical model organisms, linking responses to toxicity across the phylogenetic tree. The anticipated result is a more integrated assessment of chemical hazards to humans and the environment. In parallel, the consortium continues to collaborate with its key stakeholders to describe and improve the mechanisms

leading to the uptake or refusal of NAMs in chemical safety assessment. A forthcoming PrecisionTox report on solutions to existing roadblocks for using NAMs in regulation will be published in 2025.

As science advances, evolutionary toxicology promises to transform chemical safety testing while aligning with ethical concerns. These efforts mark a significant milestone in scientific and regulatory progress for human and environmental health protection.

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PrecisionTox is a five-year project funded by the European Union's Horizon 2020 research and innovation programme and is led by the University of Birmingham. PrecisionTox gathers 15 partners from Europe, the UK, and North America. PrecisionTox aims to better protect people's and the environment's health by establishing New Approach Methodologies (NAMs) for chemical safety testing. The Consortium uses cutting-edge approaches such as genomics, metabolomics, evolutionary theory, quantitative genetics, data science, toxicology, and law. The results of this unique interdisciplinary initiative provide a new regulatory paradigm with greater certainty at predicting which chemicals cause harm to humans without causing harm to other animals.

For more information

- [PrecisionTox website](#)
- [Report on socio-technical barriers to NAMs](#)
- [ASPIS Cluster](#)