

New technologies and approaches in toxicity testing and risk assessment

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The release of the National Research Council's Report "Toxicity Testing in the 21st Century: A Vision and a Strategy" in 2007 initiated a broad-based movement in the toxicology community to re-think how toxicity testing and risk assessment are performed. Multiple efforts in the U.S. and Europe have now generated sufficient data that together provide a practical path forward for addressing the large number of chemicals with limited toxicity information. The new approach will need to integrate new experimental technologies such as high-throughput *in vitro* screening and *in vivo* transcriptomics with computational modeling and bioinformatic analyses to identify both the relative selectivity at which chemicals interact with biological targets and the concentration at which these interactions perturb signaling pathways. The integrated analyses will be used to both define a point-of-departure for comparison with human exposure estimates and identify which chemicals may benefit from further studies in a mode-of-action or adverse outcome pathway framework. The application of new technologies in a risk-based, tiered manner provides flexibility in matching throughput and cost considerations with the degree of certainty required for specific decision contexts ranging from prioritization to full risk assessments. *This abstract does not necessarily reflect US EPA policy.*