

Advancing Adverse Outcome Pathways for Integrated Toxicology and Regulatory Applications

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Recent regulatory efforts in many countries have focused on a toxicological pathway-based vision for human health assessments relying on *in vitro* systems and predictive models to generate the toxicological data needed to evaluate chemical hazard. A pathway-based vision is equally applicable to ecological risk assessment. Pathway-based analysis of chemical effects opens numerous opportunities to apply non-traditional approaches for understanding the risks of chemical exposure. Similarities in molecular initiating events and key events that lead to toxicological outcomes provide a defensible framework for extrapolating chemical effects across species, even if the specific adverse outcomes differ between species. This opens the door for much more integrated approaches to chemical hazard evaluation in support of either human health or ecological risk assessment, that are based on consideration of pathway-conservation rather than the taxonomic origin of the test system. The objective is to maximize the predictive utility of available information and those data that can be generated most efficiently and cost effectively. However, these promising concepts and approaches for using pathway-based data in hazard screening and risk assessment need further development in order to realize their full potential. This talk will be an overview of the outcomes from an international workshop held in Somma Lombardo (Italy) in March 2014 exploring how to advance the use of Adverse Outcome Pathways (AOPs) for integrated toxicology and regulatory applications.