

Abstract Title:

Adverse Outcome Pathways (AOPs): A Framework to Support Predictive Toxicology

Presenting Author: Daniel L. Villeneuve

US EPA Mid-Continent Ecology Division, 6201 Congdon Blvd, Duluth, MN, USA 55804.

Abstract:

High throughput and in silico methods are providing the regulatory toxicology community with capacity to rapidly and cost effectively generate data concerning a chemical's ability to initiate one or more biological perturbations that may culminate in an adverse ecological or human health outcome. However, translation of those data into scientifically-defensible predictions of outcome that help support regulatory decision-making depends on the ability to efficiently access and assemble the wealth of accumulated toxicological evidence and biological understanding distributed throughout the scientific community. Adverse outcome pathways (AOPs) are frameworks for organizing knowledge in a manner that supports the extrapolation of mechanistic data, often measured at low levels of biological organization, into regulatory outcomes of concern, typically observed at higher levels of biological organization. By representing the progression of a toxicological insult as a sequence of measurable key events and assembling the weight of evidence supporting biologically-plausible predictive or cause-effect relationships between those key events, one defines both the scientific basis for extrapolation among those key events and specific endpoints that can be measured to test the veracity of AOP-based predictions. This presentation provides an introduction to the adverse outcome pathway framework and illustrates its application to support the use of predictive approaches in regulatory toxicology. *The contents of this abstract neither constitute nor necessarily reflect US EPA Policy.*