

Alternatives to the Fish Early Life-Stage Test: Developing a Conceptual Model for Early Fish Development

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ABSTRACT

Chronic fish toxicity is a key parameter for hazard classification and environmental risk assessment of chemicals, and the OECD 210 fish early life-stage (FELS) test is the primary guideline test used for various international regulatory programs. There exists a need to develop alternative methodologies to estimate fish chronic toxicity that use less animals and are more resource-efficient. The HESI Animal Alternatives in Environmental Risk Assessment Committee has initiated work in this arena, utilizing adverse outcome pathways (AOPs) to inform the development of alternative approaches. The Committee convened a May 2012 workshop to identify and discuss the scope of AOPs relevant to the FELS, which resulted in the development of a research strategy that will provide the conceptual and scientific foundation for the development of predictive alternative assays for chronic fish toxicity. A first step in the research strategy is to characterize and annotate FELS AOPs. Workshop participants assembled a generalized conceptual model of key anatomical and physiological developments during the embryonic and eleutheroembryonic stages of fish development. The model served as a useful foundation for sub-dividing fish development into key events as a basis for examining the underlying biology and beginning to outline putative AOPs. Further, the model provides a foundation for using exposures during critical windows of development and/or effect observations over the course of development to aid identification of chemical mode(s) of action. This poster will present the preliminary conceptual model and identify opportunities for collaborative research within the developmental biology and toxicology communities.

The contents of this abstract neither constitute nor reflect official US EPA policy.