Kathleen Jensen
SETAC North America 35th Annual Meeting
Vancouver, BC
November 9-13, 2014

A Novel Framework for Interpretation of Data from the Fish Short-Term Reproduction Assay (FSTRA) for the Detection of Endocrine-Disrupting Chemicals. Jensen, K.M.*, and Ankley, G.T. Mid-Continent Ecology Division, U.S. Environmental Protection Agency, Duluth, MN, USA.

The fish short term reproduction assay (FSTRA) is a key component of the USEPA endocrine disruptor screening program (EDSP). The FSTRA considers several mechanistic and apical responses in fathead minnows (*Pimephales promelas*) to determine whether an unknown chemical is likely to affect specific pathways in the hypothalamic-pituitary-gonadal (HPG) axis. Test chemicals are identified as to their potential to act as agonists or antagonists of the estrogen or androgen receptors (ER, AR), or inhibitors of steriodogenic enzymes, through effects on plasma steroid and vitellogenin (VTG; egg yolk protein) concentrations, secondary sex characteristics (SSC), gonad size and histopathology, and egg production. Although the FSTRA was first described several years ago, recent data generation associated with implementation of the EDSP highlighted the need for more formal guidance as to evaluation of information from the assay. Herein we describe a framework for interpretation of FSTRA data relative to perturbation of HPG pathways of concern to the EDSP. The framework considers endpoints individually and as suites of physiologically-related responses relative to pathway identification. Sometimes changes in single endpoints can be highly diagnostic (e.g., induction of VTG in males by ER agonists; production of male SSCs in females by AR agonists), while in other instances multiple, related endpoints are needed to reliably assess pathway perturbation (e.g., AR antagonism; steroid synthesis inhibition). In addition to description of an interpretive framework, we demonstrate its practical utility using publically-available FSTRA data for a wide range of known and hypothesized endocrine-disrupting chemicals.