

American Society for Cellular and Computational Toxicology (ASCCT)

ASCCT 4th Annual Meeting-- "Integrated approaches to testing and assessment: promises and challenges of a more flexible approach to toxicology testing."

October 1-2, 2015.

EPA, RTP

Title: Survey of ecotoxicologically-relevant reproductive endpoint coverage within ECOTOX database across ToxCast ER agonists

Authors: Kristin Connors^{1,2}, Richard Judson², Matt Martin²

1. Oak Ridge Institute for Science and Education postdoctoral fellow

2. US EPA, National Center for Computational Toxicology

Abstract: (350 words maximum)

The U.S. EPA's Endocrine Disruptor Screening Program (EDSP) has been charged with screening thousands of chemicals for their potential to affect the endocrine systems of humans and wildlife. In vitro high throughput screening (HTS) assays have been proposed as a way to prioritize chemicals for EDSP Tier 1 screening. There are 18 HTS assays within ToxCast that measure chemical bioactivity at different sites along the estrogen receptor pathway. Recent work has correlated these in vitro results to in vivo estrogenic endpoints, including the rodent uterotrophic assay. It is unclear how the in vitro HTS assays, generated in mammalian cell-lines and mammalian receptors, correlates with in vivo effects in environmentally relevant species, like fish. Here, ecotoxicological reproduction data from EPA's ECOTOX database was surveyed across the 91 chemicals identified as ER agonists by the ToxCast ER Model. In total, the ECOTOX database contains over 780,000 entries representing ~11,000 chemicals, ~11,700 species, and ~3300 endpoints. Of the 91 chemicals, 67 had ecotoxicologically-relevant reproductive endpoints within ECOTOX. Endpoints plausibly linked to estrogen-disruption were identified including: vitellogenin synthesis, abnormal sexual development, imposex/intersex conditions, effects in progeny counts, and alterations in population sex ratios. The current survey of ecological study and endpoint coverage represents a valuable resource for the modeling community.

This abstract does not necessarily represent U.S. EPA policy.