Daniel L. Villeneuve*†, Natàlia Garcia-Reyero‡, B. Lynn Escalon§, Kathleen M. Jensen†, Jenna E. Cavallin†, Elizabeth A. Makynen†, Elizabeth J. Durhan†, Michael D. Kahl†, Linnea M. Thomas†, Edward J. Perkins§, Gerald T. Ankley†

† US Environmental Protection Agency, Mid-Continent Ecology Division, 6201 Congdon Blvd., Duluth, MN, USA.

‡ Jackson State University, Department of Chemistry, Jackson, MS 39217, USA

§ US Army Engineer Research and Development Center, 3909 Halls Ferry Rd, Vicksburg, MS, USA

Effects of bisphenol A on the ovarian transcriptome of two small fish species.

Bisphenol A (BPA) is a high production volume chemical widely used in the production of polycarbonate plastics, epoxy resins, and many other commercial products. BPA has long been characterized as a xenoestrogen, and recent work suggests potential additional modes of endocrine action. To improve our understanding of the potency and diversity of BPA's effects at the molecular level, effects of the chemical on ovarian transcript profiles as well as targeted endpoints with endocrine/reproductive relevance were examined in two fish species, fathead minnow (*Pimephales promelas*) and zebrafish (*Danio rerio*), exposed in parallel using matched experimental designs. Four days of waterborne exposure to 10 µg BPA caused significant vitellogenin induction in both species. However, zebrafish were less sensitive to effects on hepatic gene expression and steroid production than fathead minnow and the magnitude of vitellogenin induction was more modest. The concentration-response at the ovarian transcriptome level was non-monotonic and violated assumptions that underlie proposed methods for estimating hazard thresholds from transcriptomic results. However, the non-monotonic profile was consistent among species and there were nominal similarities in the functions associated with the differentially expressed genes, suggesting potential activation of common pathway perturbation motifs in both species. Overall, the results provide an effective case study for considering the potential application of ecotoxicogenomics to ecological risk assessments and provide novel comparative data regarding effects of BPA in fish.