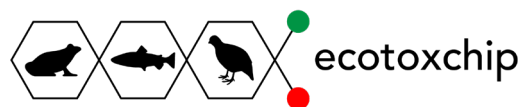


Mechanism of action (MOA): HBCD in quail



BACKGROUND INFORMATION

Hexabromocyclododecane (HBCD) is a brominated flame retardant that is listed on the Stockholm Convention. In Canada, evaluations have determined the chemical to be persistent, bioaccumulative and inherently toxic to aquatic life. Hundreds of peer-reviewed papers have characterized its toxicity in a range of organisms.

OBJECTIVE

To characterize the molecular mechanisms of action of HBCD in exposed Japanese quail (JQ) embryos using the Version 1 (V1) JQ EcoToxChip and EcoToxXplorer.

METHODS & RESULTS

Fertilized JQ eggs were injected on embryonic day 0 with 11 ug/g HBCD (in DMSO). At embryonic day 9, the liver was excised and immediately flash frozen. RNA was extracted, cDNA run on the V1 JQ EcoToxChip. The data were analyzed with [EcoToxXplorer.ca](https://ecotoxexplorer.ca) with key findings noted below.

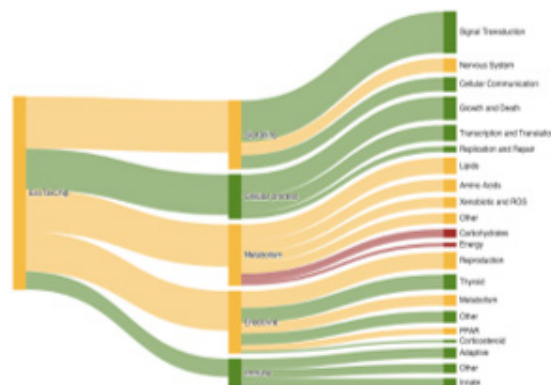
1. Top differentially expressed genes¹

	Fold Change
ORM2	73
PRODH2	38
NPHS2	28
FABB1	10
IL6	4

2. OECD adverse outcome pathways (AOPs) flagged¹

- PPAR Antagonism (AOP 6)
- AhR Activation (AOP131)

3. EcoTox processes and EcoTox modules flagged²



TAKEAWAYS

Using the EcoToxChip, we flag these samples as "GREEN". We conclude that the main biological pathways affected by this exposure were those related to carbohydrate and energy metabolism, albeit few genes were affected and no AOPs were flagged. In general, these are responses that would be expected by selenomethionine.

Notes

Farhat, A., Crump, D., Bidinosti, L., Boulanger, E., Basu, N., Hecker, M., Head, J.A. 2019. An Early life Stage Alternative Testing Strategy for Assessing the Impacts of Environmental Chemicals in Birds. Environ Toxicol Chem. doi: 10.1002/etc.4582.

¹ p<0.05; ² EcoToxXplorer V1 settings were 1.2 for yellow and 1.5 for red