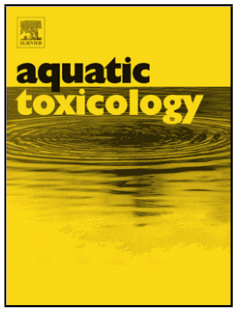

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Toxicogenomic responses of low level anticancer drug exposures in *Daphnia magna*

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Highlights:

- *Daphnia magna* neonates were exposed to low level, genotoxic concentrations of the anticancer drugs: imatinib mesylate, cisplatinum, etoposide.
- RNA-seq analysis uncovered differentially expressed transcripts related to dysregulation of cell cycle and G-protein coupled receptor signaling providing insight into the mechanism of action of these compounds.
- Angiotensin converting enzyme (*acne*) and DNA topoisomerase II (*DNA topo II)* are potential biomarkers of anticancer drug exposure.

Abstract

The use of anticancer drugs in chemotherapy is increasing, leading to growing environmental concentrations of imatinib mesylate (IMA), cisplatinum (CDDP), and etoposide (ETP) in aquatic systems. Previous studies have shown that these anticancer drugs cause DNA damage in the crustacean *Daphnia magna* at low, environmentally relevant concentrations. To explore the mechanism of action of these compounds and the downstream effects of DNA damage on *D. magna* growth and development at a sensitive life stage, we exposed neonates to low level concentrations equivalent to those that elicit DNA damage (IMA: 2000 ng/L, ETP: 300 ng/L, CDDP: 10 ng/L) and performed transcriptomic analysis using an RNA-seq approach. RNA sequencing generated 14