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Regulation of CYP 1A transcription level and enzyme activity by retinoic acids in rainbow trout hepatoma cells(RTH 149)

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Exposure of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) causes a variety of biological and toxicology effects, most of which are mediated by aryl hydrocarbon receptor (AhR). The ligand-bound AhR as a heterodimer with AhR nuclear translocator (ARNT) binds to its specific DNA recognition site, the dioxin-responsive element (DRE), and it results in increased transcription of CYP1A1 gene. Retinoic acid (RA) regulates the transcription of various genes for several essential functions through binding to two classes of nuclear receptors, the retinoic acid receptor (RAR) and retinoid X receptor (RXR).

In this study, we have examined how retinoic acids(RAs) regulated CYP1A transcription level and enzyme activity of CYP1A in rainbow trout hepatoma cell (RTH 149) using luciferase reporter gene assay system, RT-PCR and EROD activity assay system. We did transient transfection with CYP1A1 luciferase reporter gene and treated with TCDD, all-trans RA and 9-cis RA. Treatment of all-trans RA and 9-cis RA decreased the TCDD induced transcription of CYP1A1. After we have treated with all-trans RA and 9-cis RA, we observed mRNA level change of rainbow trout CYP1A using RT-PCR. For we observed the effect of retinoic acids on TCDD-induced EROD activity, we did EROD activity assay.

Keyword : rainbow trout, RTH-149, 1A, TCDD, retinoic acid