

EFFECTS OF PERFLUOROOCCTANOIC ACID AND PERFLUOROOCCTANE SULFONATE ON GENE EXPRESSION PROFILES IN MEDAKA (*ORYZIAS LATIPES*)

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Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are synthetic compounds with extensive industrial applications. They are widespread in food, wildlife, humans, and the environment, and have been known to be carcinogenic. In addition, they can cause birth defects and infertility, and disrupt membrane integrity, fatty acid metabolism, and the endocrine and immune systems. Therefore, we investigated the gene expression profiles of medaka (*Oryzias latipes*) exposed to the chemicals in order to search for potential biomarkers for PFOA and PFOS. Newly hatched medaka larvae were treated with 50 ppm PFOA or 20 ppm PFOS for 48 hours: control larvae were treated with dechlorinated water only. Both doses were 10 times lower than the respective LC₅₀ values of PFOA and PFOS. Afterwards, total RNA was extracted from pooled larvae (n=10), reverse-transcribed, and processed for oligo DNA microarray analysis (3 repeats) using duplicated 40-mer oligo DNA probes representing 5,881 medaka full length cDNAs. The result showed that the expression of 58 and 13 genes were significantly changed at least 2 folds by PFOA and PFOS, respectively (p<0.01). Among these genes, 17 genes were down-regulated by PFOA and 7 genes were down-regulated by PFOS. Both PFOA and PFOS up-regulated 3 genes that were related to post-transcriptional and translational processes, and down-regulated also 3 genes that were involved in signal transduction. Further study will be required to understand the roles of these genes in the pathways that lead to toxic effects of the chemicals.