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Differential Gene Expression after treatment with 2,3,7,8-tetrachlorodibenzo-*p*-dioxin in Hairless Mice Skin

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ABSTRACT: 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD), a prototype of many halogenated aromatic hydrocarbons, is a ubiquitous, persistent environmental contaminant and displays high toxicity in animals and has been implicated in human carcinogenesis. Although the mechanism of carcinogenesis by TCDD is unclear, it is considered to be a non-genotoxic and tumor promoter. In this study, we investigated the tumor promotion effect of TCDD on the two-stage skin chemical carcinogenesis using hairless mouse (SKH1). We induced papillomas after treatment with *N*-methyl-*N'*-nitro-*N*-nitorsoguanidine (MNNG) as a initiator and TCDD as a promoter for 30 weeks. We found that the incidence or multiplicity of papillomas and hyperplastic nodules was maximally induced at MNNG-TCDD group compare to control, MNNG, and TCDD alone. These results suggesting that TCDD can acts as a potent promoter in the hairless mouse skin. In addition, we used cDNA microarray to detect the differential gene expression in normal, tumor surrounding, and tumor regions induced in hairless mouse skin by MNNG plus TCDD protocol. We found that 49 and 42 genes out of 5,592 genes associated with protein synthesis, cell organization, lipid transport and oxidative stress in tumor and surrounding regions were up- or down- regulated two fold or more, respectively. We are currently investigating how these genes play a role in TCDD-mediated chemical carcinogenesis.

Keywords : TCDD, MNNG, hairless mice, cDNA microarray, gene expression