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Down-regulation of CYP1A1 Expression in Hepa-1c1c7 Cells by 3',4',3,5,7-O-Methylated Catechin

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Green tea catechin is known to exert chemopreventive effects in many cancer models. In the present study, we investigated the effect of 3',4',3,5,7-O-methylated catechin on 2,3,7,8-Tetrachlorodibenzo-p-dioxine (TCDD)-inducible P450 1A1 gene expression in mouse hepatoma Hepa-1c1c7 cells. In the present study, we investigated the effect of 3',4',3,5,7-O-methylated catechin on TCDD-inducible P450 1A1 gene expression in mouse hepatoma Hepa-1c1c7 cells. 7-ethoxyresorufin O-deethylase (EROD) activity in the Hepa-1c1c7 cells was significantly increases by 3',4',3,5,7-O-methylated catechin. TCDD-induced cytochrome CYP1A1-specific EROD activity was markedly reduced in the concomitant treatment of TCDD and 3',4',3,5,7-O-methylated catechin. TCDD-induced CYP1A1 mRNA level was also markedly suppressed in the concomitant treatment of TCDD and 3',4',3,5,7-O-methylated catechin. A transient transfection assay using dioxin-response element (DRE)-linked luciferase revealed that 3',4',3,5,7-O-methylated catechin reduced transformation of the aryl hydrocarbons (Ah) receptor to a form capable of specifically binding to the DRE sequence in the promoter of the CYP1A1 gene. These results suggest the down regulation of the CYP1A1 gene expression by 3',4',3,5,7-O-methylated catechin in Hepa-1c1c7 cells might be antagonism of the DRE binding potential of nuclear Ah receptor and may prove to be an effective chemopreventive agent.

Keyword : 3',4',3,5,7-O-methylated catechin, CYP1A1 gene, Ah receptor