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The effect of PCBs (polychlorinated biphenyls) on EROD activity in vivo.

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PCBs are wide spread persistent environmental pollutants that exert a broad spectrum of toxic effects. PCBs includes 209 possible congeners differing in extent and position of chlorination of their aromatic rings. In order to understand the toxic mechanism of PCBs, we have tested the effect of PCB on the EROD activity in vivo. Among the AhR gene battery, CYP4501A is a well understood parameter for the potency of AhR agonists. The 7-ethoxyresolufin O-deethylase(EROD) activity of CYP4501A isozyme is widely accepted marker to measure the inducibility of dioxin-like compounds on CYP1A gene expression. The bioaccumulated diortho-chloro-substituted PCB congeners, PCB118(2,3',4,4'5-pentachlorobiphenyl), PCB138 (2,2',3',4,4'5-hexachlorobilhenyl), PCB153 (2,2',4,4',5,5'-hexachlorobilhenyl), PCB180 (2,2'3,4,4'5,5'-heptachlorobiphenyl) and commercial (the technical mixture) PCBs, Aroclor 1254 were administered into SD rats and ERDO activity of rat liver microsome was examined. Also in order to evaluate the possible cross talk between these chemicals and estrogen we have compared the effect of a series of diortho-substituted PCB congeners alone treatment and cocomitant treatment with estrogen on CYP1A-catalyzed EROD activities. As expected, Aroclor showed the induction of CYP1A-catalyzed EROD activity in rat liver microsome whereas PCB congeners that we have tested didn't. Aroclor1254 treatment showed the dose-dependent increase of EROD activity in SD rat liver microsome and the effect of Aroclor1254 was inhibited by E2 concomitant treatment. However EROD activity of PCB congeners and estrogen cocomitant treatment showed no differanaces compared to that of alone treatment. Estrogen inhibit the Aroclor1254-induced CYP1A mediated ERDO activities.