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**VALIDATION OF THE AHH INDUCTION BIOASSAY FOR THE DETERMINATION OF
2,3,7,8-TCDD TOXIC EQUIVALENTS**

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The effects of structure on the activity of 27 polychlorinated dibenzo-p-dioxin (PCDD), dibenzofuran (PCDF), biphenyl (PCB) and polybrominated dibenzo-p-dioxin (PBDD) congeners has been determined in the immature male Wistar rat [body weight loss, thymic atrophy, hepatic microsomal aryl hydrocarbon hydroxylase (AHH) and ethoxyresorufin O-deethylase (EROD)] and in rat hepatoma H-4-II E cells in culture (AHH and EROD induction). There was a good linear correlation between the $-\log EC_{50}$ values for AHH induction (in vitro) and the in vivo $-\log ED_{50}$ values for AHH induction ($r=0.85$), body weight loss ($r=0.93$) and thymic atrophy ($r=0.92$) for the 27 compounds investigated in this study. Comparable in vivo studies have also been carried out using several PCDD and PCDF congeners (2,3,7,8-, 1,3,7,8- and 1,2,4,7,8-substituted PCDDs; 2,3,4,7,8-, 1,2,3,7,8-, 2,3,4,7,9- and 1,2,3,7,9-substituted PCDFs) using the guinea pig as the model. There were excellent linear correlations ($r > 0.92$) between the $-\log EC_{50}$ (in vitro AHH induction) vs. the $-\log ED_{50}$ (in vivo responses) and the $-\log ED_{50}$ (guinea pig in vivo data) vs. $-\log ED_{50}$ (rat in vivo data). These results further validate the utility of the in vitro AHH induction assay for quantitatively estimating the potential toxicity of PCB, PCDF and PCDD mixtures in environmental extracts. This assay can be carried out rapidly, is relatively inexpensive and utilizes the established (and stable) rat hepatoma H-4-II E cells in culture which can detect 20-50 pg of 2,3,7,8-TCDD equivalents per plate.