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Comparison of methoxychlor-induced weight changes and calbindin D-9k mRNA expression in rat uterus by the route of administration

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Exposure to some synthetic environmental chemicals and their metabolites cause reproductive problems in a variety of vertebrate via endocrine mechanisms. However, in most cases, the link between these compounds and adverse effects on humans, fish, and wildlife has not been established, which necessitates a closer look at the molecular, functional, and clinical implications of these chemicals in the environment. Calbindin-D9k (CaBP-9k) is a member of a large family of intracellular calcium binding proteins that have high affinities for calcium. It was reported that the estrogen level of uterus affected the expression of the CaBP-9k gene in rat uterus. We examined the dose-dependent CaBP-9K gene expression in the uterus for three-days injection of methoxychlor (MC) in the overectomized immature rats and the relation with uterotrophic response of the compoundsand compared the responses induced by MC according to the route of administration. A dose-dependent uterotrophic response to the oral administration or subcutaneous injection of MC was shown. A significant increase in the uterine wet weights was observed when treated orally with 50 mg/kg/day and above, but when treated subcutaneously only the highest group showed a significant increase of uterine weight. The weight of vagina showed the same change as that of uterus. CaBP-9k mRNA is induced by MC and the weight of uterus is increased. And the expression of mRNA and the weight are different according to the route of

administration. When MC was administered orally, the estrogenic response in terms of the weight of uterus and the expression of CaBP-9k mRNA was much stronger than SC treatment. The estrogenicity measured in CaBP-9k mRNA expression was correlated with in vivo uterotrophic assay. Our data suggest that CaBP-9k mRNA assay in the rat uterus may be used as a tool to identify substances with estrogenic activity when used in combination with the classical assay.