Estrogenic Activity Assessment of Alkylphenolic chemicals using in vitro assays : Ⅲ. Rcombinant Yeast Transcriptional Assay

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There is a concern that chemicals in our environment are affecting human health by disrupting a normal endocrine function. Much of the concern has focused on chemicals that can interact directly with steroid hormone receptors. The ability of certain man-made chemicals to mimic the effects of natural steroid hormones and their potential to disrupt the delicate balance of the endocrine system in animals are of increasing concern. The growing list of reported hormone-mimics includes the alkylphenolic (AP) compounds, a small number of which have been reported to be weakly estrogenic. We have used a yeast-based assay to assess chemical interaction with the estrogen, androgen, and progesterone receptors. The yeast transformants used in this study contained the human estrogen, androgen, or progesterone receptors along with the appropriate steroid responsive elements upstream of the β-galactosidase reportor gene. In yeast estrogen screening (YES), in the presence of estrogen, β-galactosidase is synthesized and secreted into the medium, where it cause a color change from yellow to red. p-nitrophenol (Maximal Response; 105.3%) and 17β-estradiol (MR; 100%) were most active in the estrogen receptor assay, followed by the 4-tert-octylphenol (MR; 91.3%), 4-4'-isopropylidenediphenol (MR; 88.4%), and p-nonylphenol (MR; 80.2%), When only 4,-4'-isopropylidenediphenol was added 200 fold more than the rest of compounds used. Methyltestosterone (MR; 100%) were most potent in the androgen receptor assay, followed by estradiol and progesterone. isocyanic acid-chlorophenol showed a weak response (MR; 3.36%). In progesterone receptor assay, p-nonylphenol showed a weak response (MR; 4.68%). The rest of the alkylphenol chemicals tested did not interacted with the androgen and progesterone receptors.

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