

Poster #29

Xenoestrogen Activity in Human and Trout Estrogen Receptor Reporter Assays: Species Specific Agonist and Antagonist Effects

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Xenoestrogens are endocrine disrupting chemicals that bind and regulate the estrogen receptor (ER). Considering that a wide range of wildlife species as well as humans may be exposed to estrogenic chemicals, an understanding of the species specificity of xenobiotic ER ligands is desirable. In this report, we compare the estrogen activity of known xenoestrogens in mammalian and trout cell reporter gene systems regulated by either the human ER or trout ER. Mammalian cell assays involved MCF-7 cells while trout cell assays used RTH-149 cells. A vit-Luc reporter plasmid was either transfected (MCF-7) or cotransfected with rtER (RTH-149) using the FuGene method. Luc activity in each assay system was performed after 48 hour exposure to test chemicals. Steroid estrogens were found to induce similar Luc activity in both receptor systems with potency 10 times greater in the hER assays than those containing rtER. Xenoestrogens such as o,p'-DDT, kepone and HPTE were found to be less potent and less efficacious agonists in the rtER reporter systems. At the same time, DES, t-octylphenol and bisphenol A displayed only a reduced capacity to stimulate Luc activity regulated by trout ER. Surprisingly, HPTE, o,p'-DDT, p,p'-DDT, kepone, dieldrin, and bisphenol A were shown to induce significant antiestrogen activity in the trout receptor reporter gene assays. We conclude that depending on the species context of estrogen receptor and cell type, xenoestrogens may have agonist or antagonist activity. This study highlights the importance of molecular level determinations of the species specific steroid receptor mediated endocrine disruptor potential of xenobiotic chemicals.