environment, they have become widespread environmental pollutants, thus leading to a variety of phthalates that possibly threaten the public health. Among phthalate esters, dibutyl phthalate (DBP) is reported to have estrogenic activity. To elucidate estrogenic activity of DBP, it was studied by E-screen test and cDNA microarrays in MCF7 human breast cancer cells. The E-screen test uses estrogen-sensitive human breast MCF7 cells and compares the cell yield achieved after 6 days of culture in the medium supplemented with 5% charcoal-dextran stripped fetal bovine serum (FBS) with diverse concentrations of 17β-estradiol and DBP. 17β-estradiol of 10^{-8} M and DBP of 10^{-7} M were active in the E-Screen test. Based on the established doses, we compared the pattern of gene expression with the cDNA microarray. It showed some of variation in gene expression patterns among MCF7 cells treated with 17β-estradiol and DBP.

[PA4-20] [10/19/2000 (Thr) 10:00 - 11:00 / [Hall B]]

Suppressive Effect of Bisphenol A on the Cytochrome P450 1A1 Induction in Hepa-1c1c7 Cells

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Bisphenol A (4,4'-isopropylidenediphenol) is a monomer in polycarbonate plastics and a constituent of epoxy and polystyrene resins that are used extensively in the food-packaging industry and it has been shown to possess estrogenic properties. In the present study, we investigated the effect of bisphenol A on TCDD-inducible P450 1A1 gene expression in mouse hepatoma Hepa-1c1c7 cells. 2,3,7,8-Tetrachlorodibenzo-p-dioxine (TCDD)-induced cytochrome P450 1A1-specific 7-ethoxyresorufin O-deethylase (EROD) activity was markedly reduced in the concomitant treatment of TCDD and bisphenol A in a dose dependent manner. TCDD-induced P450 1A1 mRNA level was also markedly suppressed in the concomitant treatment of TCDD and bisphenol A. Transient transfection assay using dioxin-response element (DRE)-linked luciferase revealed that bisphenol A reduced transformation of the aryl hydrocarbons (Ah) receptor to a form capable of specifically binding to the DRE sequence in the promoter of the P450 1A1. These results suggest the down regulation of the P450 1A1 gene expression by bisphenol A in Hepa-1c1c7 cells might be antagonism of the DRE binding potential of nuclear Ah receptor.

[PA4-21] [10/19/2000 (Thr) 10:00 - 11:00 / [Hall B]]

MEASUREMENTS OF ESTROGEN LIKE AND DIOXIN LIKE ACTIVITIES IN KOREAN RIVER WATER USING REPORTER GENE SYSTEM.

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The endocrine system is a complex network of glands and hormones that regulates many of the body's functions, including growth, development and maturation, as well as the way various organs operate. The endocrine glands (the pituitary, thyroid, adrenal, thymus, pancreas, ovaries, and testes) release carefully-measured amounts of hormones into the bloodstream that act as natural chemical messengers, traveling to different parts of the body in order to control and adjust many life functions.
Endocrine disruptor is a synthetic chemical that when absorbed into the body either mimics or blocks hormones and disrupts the body's normal functions. This disruption can happen through altering normal hormone levels, halting or stimulating the production of hormones, or changing the way hormones travel through the body, thus affecting the functions that these hormones control. Chemicals that are known human endocrine disruptors include diethylstilbesterol (the drug DES), dioxin, PCBs, DDT, and some other pesticides.
Domestic and industrial effluents have been discharged to Kumho River, Kum River, Mankyung River and Miho Stream of Korea, so contaminated with various organic compounds. We have

examine the estrogenic and dioxin like activites using pERE-Luc and pCYP1A1-Luc reporter system. River water was extracted using combined solid-phase extraction in static adsorption mode with soxhlet extraction. Chemicals adsorbed to the XAD-4 resin were recovered 98.24± 5.90% by elution with ethyl acetate and methylene chloride (1:9). Kumho River of Korea showed 0.77 pM EEQ in upstrean and 7.7pM EEQ in downstream. Kum River of Korea showed 3.5pM and 1.7pM EEQ in upstream and downstream respectively. Mankyung River of Korea showed 61fM and 0.41 pM EEQ in upstream and downstream respectively. Miho Stream of Korea showed 0.2pM EEQ only in the upstream. All these samples were tested with pCYP1A1-Luc activity and results showed there were more dioxin like activities in sediments than water from the river.

[PA4-22] [10/19/2000 (Thr) 10:00 - 11:00 / [Hall B]]

No teratogenicity of Phthalates using in vitro battery system

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Phthalates have been used as plasticizers in polyvinyl chloride plastics such as cable coating, flooring, and blood bags. It was generally demonstrated that many phthalates is a developmental toxicant in rodents. However, in vitro teratogenic effects of phthalates are not clearly known. The aim of this study was to investigate the teratogenic potential of phthalates (DEHP, BBP, and DBP) using in vitro battery system. Short-term in vitro battery system (whole embryo culture and limbbud and midbrain cell micromass culture) has been proposed as a preliminary screening method of teratogens.In whole embryo culture, rat embryos at gestation day 9.5 were cultured in rat IC serum for 48 h. Micromass culture of embryonic limbbud and midbrain cells was performed based on the method of Flint. After 5 days of culture, cell proliferation was assessed by neutral red uptake and cell differentiation was determined by hematoxylin-stained foci area or alcin blue staining, respectively. In whole embryo culture, there were no morphological abnormalities of embryo at any concentration of phthalates. However, phthalates tested in our studies decreased growth and development of embryo only at higher concentration. Although in vitro battery system did not detect the embryotoxicity of phthalates, these results suggest that phthalates (DEHP, DBP, and BBP) itself are able to alter normal embryonic growth and development.

[PA4-23] [10/19/2000 (Thr) 10:00 - 11:00 / [Hall B]]

Comparative evaluation of a 20-day thyroid/pubertal male assay and Hershberger assay for the detection of androgenic/antiandrogenic activity

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Several different screening and testing methods for the detection of endocrine disruptors (EDCs) have been proposed recently. A rodent Hershberger assay is one of the screening methods recommended by EDSTAC and OECD. A rodent 20-day thyroid/pubertal male assay is also one of alternative methods to replace the Tier I Screening Battery. The purpose of our study is to evaluate comparatively short-term in vivo screening methods to detect substances with androgenic/antiandrogenic activity. Hershberger assay was performed utilizing immature Sprague-Dawley male rats castrated at 6 weeks of age. Testosterone (0.4 mg/kg/day) was subcutaneously (s.c.) injected for 10 days. Additionally, a pure androgen antagonist, flutamide (1, 5, and 10 mg/kg/day) was administered by oral gavage after testosterone treatment. In testosterone treatment group, glans penis (GP), seminal vesicles (SV), ventral prostate (VP), levator ani muscle