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The river water in Korea had been highly polluted, due to insufficient facilities of wastewater treatment and become social issue. After 1980s intensive effort on the recovery of water quality has been conducted. Even though water quality measured by chemical parameters such as BOD, COD, etc is improved, abnormalities of ecological organisms are still founded in the river. Therefore, there is a growing concern that a wide variety of chemicals released into the environment can disrupt the endocrine system of fish, wildlife and humans. One of in vitro assays, the E-SCREEN assay is quantitative to assess the estrogenicity of chemicals using the proliferative effect of estrogens on MCF-7 cells. This assay is a useful and sensitive method to assess environmental samples, which were mixed various estrogen-mimicking pollutants. Estrogenic activity of Gab stream and Mankyung river waters, which have been discharged domestic, industrial effluents and presumed to be contaminated various organic compounds, were determined using the E-SCREEN assay in July 2000. 50L of river water was adsorbed using XAD-2 resin column. Pollutants adsorbed to the XAD-2 resin were extracted by elution with methanol (sample Ⅰ), and with ethyl acetate (sample Ⅱ). XAD-2 extracts showed variable proliferation of MCF-7 BUS cells. RPP, RPE, and EEQ were useful to assess quantitative determination of total estrogenic activity in the river waters.

[PA3-11] [10/19/2000 (Thr) 10:00 - 11:00 / [Hall B]]

Monitoring of River Water Pollution using EROD -microbioassay

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So far, investigation of environmental pollution has been achieved in field study. This remains the most exhaustive approach, current dimensions of environmental researches and their inherent complexity require that relatively inexpensive and simple laboratory procedures are developed to make possible the screening of large numbers of sites and samples. At this point, microbioassay has been highlighted. The purpose of this study is to evaluate the water pollution using EROD-microbioassay. The methods were optimized and validated for the sensitive and quantitative determination of total toxic effects of the river water samples. The EROD-microbioassay was executed in rat hepatoma cell line, H4IIE and focused to detect PAHs, PCBs and dioxinlike components in the water. Gab stream and Mankyung river were selected for this study. 50L of river water was absorbed using XAD-2 resin column. Pollutants adsorbed to the XAD-2 resin were extracted by elution with methanol (sample Ⅰ), and with ethyl acetate (sample Ⅱ). Total toxic effects of extracts were determined by EROD-microbioassay. Gab-downstream water sample showed the highest EROD activity. There is rare site relation between the water and sediment sample in EROD activity. At this point, we presumed that the river water environmental in Korea were polluted with various toxic chemicals.

[PA3-12] [10/19/2000 (Thr) 10:00 - 11:00 / [Hall B]]

Immunohistochemical Characterization for Apoptotic Mechanism in Bile Duct - Ligated Rats

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Toxic bile salts are known to exert hepatocyte toxicity by inducing apoptosis. Although it has been reported that Fas- death receptor pathway is the predominant pathway of apoptosis in cholestasis, the precise mechanism of bile salt-mediated apoptosis is still not fully understood. We investigated cellular localization and expression of proteins involved in the bile salt-mediated apoptosis in bile duct-ligated (BDL) rats by immunohistochemistry and Western blot analysis. Activated stellate cells, responsible for liver fibrosis, were ncreased in portal and periductular areas in BDL rats over 8 weeks. In sham controls, Fas was weekly expressed in cytoplasm of hepatocytes but not in bile duct epithelial cells (BEC). The expression was inhanced by BDL for first 3 days, and remained constituitively expressed over 8 weeks. Bax was expressed in a punctate manner indicative of mitochondrial localization in BEC and hepatocytes of sham controls. Bax was increased by BDL, and then its expression was decreased with time. Antiapoptotic protein Bcl-2 was detected only in BEC of sham controls. At day 3 after BDL, de novo Bcl-2 expression was observed in hepatocytes, and the strong immunoreactivity was observed in hepatocytes located along the bile ductules. After BDL for two weeks, expression of Bcl-2 showed a marked increase in BEC and also showed strong expression in periportal hepatocytes. Expression pattern of p53, a transcription factor, was very similar to that of Bax expression. We demonstrated that Fas was strongly expressed in the cytoplasm of hepatocytes in BDL rats, indicating the involvement of soluble Fas molecules. Expression pattern of Bax showed a good inverse correlation with that of Bcl-2 expression. Also expression of Bax may be regulated by p53.

[PA3-13] [10/19/2000 (Thr) 10:00 - 11:00 / [Hall B]]

Comparison of corresponding human intake giving biochemical toxicity induced by TCDD in risk Assessment

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The most sensitive biochemical effect dioxin and related chemicals are CYP1A1/2 induction, EGF-receptor down regulation and oxidative stress. Currently, the body burden giving rise to specific toxicological endpoint has been used for calculation of human external intake in dose-response assessment in field of risk assessment improved by PB-PK model. The animal body burden giving rise to statistically significant effect related with CYP1A1/2 induction, and EGF receptor down-regulation induced by TCDD using animal data have reported as range of 3~10ng/kg by WHO (1998). U.S.EPA(2000) suggested corresponding animal body burden (0.17~12.3ng/kg) giving biochemical toxicity like CYP1A1/2 induction and EGF receptor down regulation from dose-response model. This study has compared difference of above two value using conversion equation which can human intake level from animal body burden : Intake(ng/kg/day) = body burden(ng/kg)×ln2 / half-life×absorption rate (ln2=0.693, half-life 7.5years, absorption rate 50%). The range of corresponding human intake giving biochemical toxicity based on WHO and U.S.EPA data were 1.52~5.06pg/kg/day and 0.086~6.23pg/kg/day, respectively.
If above two values regard and apply uncertainty factor 10 (human variability), tolerable daily intake 0.009~0.62pg/kg/day can be used as possible human intake without giving rise to biochemical toxicity induced by TCDD.

[PA4-1] [10/19/2000 (Thr) 10:00 - 11:00 / [Hall B]]

The Role of Rat Plasma in Manifesting Toxicity of Erythrocytes by Water -Soluble Menadione: Further Evidence of Free Radical Generation

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