

of liver fibrosis. In this study, we investigated the protective effects of an aqueous extract from the roots of *Platycodon grandiflorum* A. DC (Campanulaceae), Changkil (CK), on hepatic fibrosis in hepatic stellate cells. We report that CK reduces the accumulation of collagen in acetaldehyde-induced hepatic stellate cells. The accumulation and synthesis of collagen were measured by Marson-Trichrom stain and pulse-labeling with [<sup>3</sup>H]-proline, respectively. As the results, CK inhibited collagen accumulation and incorporation of proline in a dose dependent manner. Furthermore, the effects of CK on expression of alpha-smooth muscle actin (a-SMA) and collagen type I were evaluated utilizing immunocytochemistry. CK reduced a-SMA and collagen type I expressions compared with acetaldehyde-induced hepatic stellate cells. These results suggested that the protective effects of CK on the hepatic fibrosis in stellate cells might, at least in part, be due to its ability to reduce the accumulation of collagen and blocked activation of hepatic stellate cells by acetaldehyde.

[PA4-7] [ 2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function ]

### **Effects of Mancozeb on cell-mediated immunity in mice.**

Chung AeHee<sup>o</sup>, Pyo MyoungYun

*Seoul Metropolitan Government Research Institute of Public Health & Environment and Sookmyung Women's University*

Mancozeb is a protective fungicide on plants and a polymeric complex of ethylene bisdithiocarbamate manganese with zinc salt. It is reported to induce teratogenic and carcinogenic effect in laboratory animals. But the immunomodulating effects of Mancozeb exposure have not been systemically evaluated. The purpose of this study was to investigate the effects of Mancozeb on cell-mediated immunity in mice. For ex vivo assessment, mice were orally exposed to Mancozeb dissolved in distilled water as concentrations of 2,500, 5,000, 10,000 mg/kg for single occasion (acute exposure) or 250, 1,000, 1,500 mg/kg/day 5 days a week for 30days(subacute). Splenocyte proliferation was significantly suppressed through T cell mitogen supplementation. IFN- $\gamma$  production was decreased both acute and subacute exposure, IL-4 production was increased in subacute exposure. These results suggest that Mancozeb could alter cell-mediated immunity in mice.

[PA4-8] [ 2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function ]

### **The Effect of 3-MCPD on Male Fertility and Sperm Parameters in Rats**

Kwack Seung Jun<sup>o</sup>, Kim Soon Sun, Rhee Gyu Seek, Lee Rhee Da, Chae Soo Young, Choi Yo Woo, Lee Hyun Joo, Park Kui Lea  
*NITR, FDA*

3-Monochloro-1,2-propanediol(3-MCPD) is a toxic compound, often present in different foods containing acid hydrolyzed(AH) protein, like seasonings and savory food products. In Korea, 3-MCPD is currently being a problem because of its toxicity in AH soybean sauce. The purpose of the present studies was to investigate the effects of 3-MCPD on male fertility, sperm and testosterone secretion. In vivo male fertility test was performed for observing the adverse effects of 3-MCPD on the function of male reproductive system and pregnancy outcome. 0.01, 0.05, 0.25, 1 and 5 mg/kg bw of 3-MCPD were given daily by gavage to groups of 15 adult male SD rats for 4 weeks. At the end of pre-treatment period, males were mated overnight with untreated females. Following morning, males demonstrating successful induction of pregnancy were sacrificed on that day to assess sperm parameters and histopathology of reproductive organs. The resulting pregnant females were sacrificed on day 20 of gestation to evaluate pregnancy outcome. As a result, four-week paternal administration with 3-MCPD resulted in adverse effects on male fertility and pregnancy outcome without remarkable histopathological changes in testes and epididymides; sperm motility, copulation index and fertility index were markedly decreased in the treated group and numbers of live fetuses showed steep dose-response curves. Also, spermatogenesis was investigated in this experiment. However, no effect was observed on production of sperm in testes treated with 3-MCPD for 4 weeks. Hormone assay was performed for observing the effects of 3-MCPD on testosterone and luteinizing hormone(LH) in blood and testes of male SD rats and cultured primary Leydig cell. In result, significant change of related hormones did not observed by treatment of 3-MCPD. These results indicated that paternal treatment with

3-MCPD induced spermatotoxic effect, which caused a antifertility on male.

[PA4-9] [ 2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function ]

### **Effects of zinc and resveratrol on cadmium-induced apoptosis and cell arrest in MCF-7 and MDA-MB-231 cells**

Lee Su Jung<sup>o</sup>, Shin Jae-Ho, Kim Tae Sung, Moon Hyun Ju, Kang Il Hyun, Kim In Young, Oh Ji Young, Lee Young Ju, Kim \* An Keun, Han Soon Young

*Endocrine Toxicology Division, National Institute of Toxicological Research, Korea FDA, \* College of Pharmacy, Sookmyung Women's University*

Cadmium, a human carcinogen, can induce apoptosis in various cell lines. Despite extensive research, the mechanisms of cadmium-induced apoptosis are poorly understood, and its toxicity and estrogenic potential in human are not clear. This study was performed to investigate the apoptotic activities of cadmium on two human breast cancer cell lines: MCF-7 cells, an estrogen receptor (ER) positive cell line, and MDA-MB-231 cells, an ER negative cell line. Both cells were treated with CdCl<sub>2</sub> 100μM for 12hrs, and the apoptosis was determined by DNA fragmentation, DAPI staining, and expression of caspase-9. Flow cytometric analysis showed that MCF-7 cell was arrested in S phase and induced expression of p21 and p27 after treated CdCl<sub>2</sub>. The expression of ER-α, ER-β, pS2 and activities of antioxidative enzymes such as superoxide dismutase, catalase, glutathion reductase were determined also. Cadmium induced apoptotic cells dose-dependently, increased S phase cell population and decreased antioxidative enzyme activities in both cells. The expressions of ER-α, ER-β and pS2 were increased in MCF-7 cells, and the expression of ER-β and pS2 were increased in MDA-MB-231 cells. Co-treatment of zinc (100μM, 12hrs) or preincubation with resveratrol (25μM, 12hrs) decreased the cadmium-induced apoptotic cell numbers and recovered the antioxidative enzyme activities in both cells. Our data showed that the cadmium induced apoptosis and cell cycle arrest in human breast cancer cells by oxidative stress and antioxidants such as zinc and resveratrol inhibited cadmium-induced apoptosis. and cell arrest.

[PA4-10] [ 2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function ]

### **Analysis of 3-monochloro-1,2-propanediol(3-MCPD)in soy sauce products in Korea**

Lee Byung Mu<sup>o</sup>, Song Hyun Suc<sup>o</sup>

*College of Pharmacy, Sungkyunkwan University*

3-Monochloro-1,2-propanediol(3-MCPD) was analyzed in soy sauce products commercially available in Korea. A total of 24 samples were collected and 3-MCPD was determined by GC/MS. Sources of 24 samples were classified by manufacturing methods as naturally brewed(NB), acid hydrolyzed(AH) and mixed(M=NB+AH) soy sauces. 3-MCPD was not detected in NB soy sauce products (< 0.01 ppm, mg/kg) whereas AH and M soy sauce products showed a wide range of 3-MCPD contamination(0.01 ~ 2.038ppm). The contaminated levels of 3-MCPD in soy sauce products were higher than the permissible or tentative permissible level of 3-MCPD in both European Community(0.02 ppm) and Korea(0.3 ppm). These data suggest that 3-MCPD levels contaminated in soy sauce products in Korea were shown to be too high and should be reduced to as low a level technologically feasible to protect Koreans from the exposure to toxic chemical, 3-MCPD.

[PA4-11] [ 2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function ]

### **Effects of Saururus chinensis Baill on Atherosclerosis and Lipidperoxidation in 2,3,7,8-tetrachlorodibenzo-p-dioxin Treated Rats.**

Lee SangHun, Kim Hee Jin, Lee Jin-Young, Ha Bae Jin<sup>o</sup>

*Department of Bioscience & Biotechnology, Silla University*

Saururus chinensis Baill (Saururaceae) is a perennial plant that has been used in the treatment of edema, jaundice and gonorrhea in Korean folk medicine. This study was carried out to investigate the inhibitive effects of