Cadmium induces apoptosis in human lung fibroblast by inducing oxidative stress: A role of Bax and Bcl-2

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Cadmium (Cd) is an inorganic toxicant of great environmental and occupational concern which was classified as a human carcinogen in 1993. Occupational cadmium exposure is associated with lung cancer in human. In the present study, we established the mechanistic basis of apoptotic cell death induced by Cd in WI38 human lung fibroblast. Cd at 20 – 80 μM decreased viability of cells in a concentration-dependent manner. PI staining, TUNEL staining and DNA fragmentation analysis demonstrated the apoptotic cell death by Cd. Data show that Cd-induced apoptosis involves: (a) production of reactive oxygen species; (b) cleavage of Bax and translocation of truncated Bax from the cytosol to the mitochondria and cytochrome c release from the mitochondria to the cytosol; (c) increased permeabilization of mitochondrial membranes as determined by confocal and FACS analysis of loss of a mitochondrial selective fluorescent dye; (d) processing of caspase-8, -9 and –3 and cleavage of PARP as determined by Western blot analysis. Pretreatment of antioxidant inhibited apoptotic death of WI38 cells and some molecular event induced by Cd. These data suggest that reactive oxygen species is an important intermediate and Bax/Bcl-2 play central role in Cd-induced apoptotic cell death.

[PA3-11] [2003-10-11 09:00 - 12:30 / Grand Ballroom Pre-function]

Development of hangover settlement from natural products

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Hangover is associated with alcohol metabolism in body after the ingestion of an alcoholic beverage. It has been known that hangover is caused by increasing blood acetaldehyde concentration. This study was carried out to evaluate effect against blood ethanol(EtOH) and acetaldehyde(AcH) on the seven natural products samples(Lotus seed, Sweet chest nut rose, Kohki, Gurume-K, Gurume-J, Phytic acid and Chlorophyll). Also, samples which were selected as good products were mixed. Then, effect against blood EtOH and AcH formulas were tested in vivo. The Sweet chest nut rose, Kohki, Gurume-K, Gurume-J and Lotus seed were significantly ($p>0.05$)decreased blood EtOH and AcH concentration. Phytic acid and chlorophyll were not producing the effects desired.Based on these results, six formulas were significantly($p<0.05$)decreased lower than control. The formula 6 (consist of Grurume –J 10%, Sweet chest nut rose 0.2667%, Lotus seed 0.0667%, Kohki 0.0667%, respectively) was the best effects on the decreasing blood EtOH and AcH concentration.

[PA3-12] [2003-10-11 09:00 - 12:30 / Grand Ballroom Pre-function]

The Change of the Components and Forms of the Counterfeit 100mg VIAGRA™ Tablets

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VIAGRATM, an oral therapeutic agent for erectile dysfunction, is the citrate salt of sildenafil. VIAGRATM is formulated as blue, film-coated rounded-dia-mond-shaped tablets, equivalent to 25mg, 50mg and 100mg of sildenafil for oral administration.ViagraTM has been allowed to be sold at the drug store in Korea officially, but it is still increased to sell or use counterfeits or smuggled goods, because of its high price or strict restriction on both sale and purchase.Discrimination and analysis of 13 cases of VIAGRATM tablets for verification of genuineness

or counterfeit were requested to our institute on the period, from January 1999 to July 2003.We analyzed the samples which were requested to our institute for the verification by using Stereoscopic Microscope, HPTLC(with Automated TLC Sampler, Automated Multiple Developer and TLC Scanner), HPLC, and FT-IR. As the results 8 cases of total 13 cases were proven to be the genuine, but the other 5 cases, counterfeits. Among 5 counterfeits 3 cases were detected to be a acetaminophen and caffeine, which were requested before 2001. And also, we could find that the samples requested after 2001 were made as very similar shape as the genuine one, containing Sildenafil citrate.

[PA3-13] [2003-10-11 09:00 - 12:30 / Grand Ballroom Pre-function]

A ginseng saponin metabolite-induced apoptosis in HepG2 cells involves a mitochondria-mediated pathway and its downstream caspase-8 activation and Bid cleavage

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20-O-(β-D-Glucopyranosyl)-20(S)-protopanaxadiol (IH901), an intestinal bacterial metabolite of ginseng saponins formed from ginsenosides Rb1, Rb2 and Rc, is suggested to be a potential chemopreventive agent. Here we show that IH901 induces apoptosis in human hepatoblastoma HepG2 cells. IH901 led to an early activation of procaspase-3 (6 h posttreatment), and the activation of caspase-8 became evident only later (18 h posttreatment). Caspase activation was a necessary requirement for apoptosis because caspase inhibitors significantly inhibited cell death by IH901. Treatment of HepG2 cells with IH901 also induced the cleavage of cytosolic factors such as Bid and Bax and translocation of truncated Bid to mitochondria. A time-dependent release of cytochrome c from mitochondria was observed, which was accompanied by activation of caspase-9. zVAD-fmk and zIETD-fmk abrogated Bid processing and translocation, cytochrome c release and caspase-3 activation. The activation of caspase-8 was inhibited not only by zIETD-fmk but also by zVAD-fmk, which is known to inhibit caspase-1, -3, -4 and -7. The results, together with the kinetic change of caspase activation, indicate that activation of caspase-8 occurred downstream of caspase-3 and -9. These results suggest that the activation of caspase-8 after early caspase-3 activation might act as an amplification loop necessary for successful apoptosis. Levels of neither Fas mRNA nor protein were changed by IH901. Preincubation of HepG2 cells with antagonistic anti-Fas antibody showed little protective effect, if any, on IH901-induced cell death, indicating the possibility that the Fas/FasL system is not involved in IH901-induced apoptosis in HepG2 cells. Primary hepatocytes isolated from normal SD rats were not affected by IH901 (0–60 μM). The very low toxicity in normal hepatocytes and high activity in hepatoblastoma cells suggest that IH901 is a promising cancer chemopreventive agent.

[PA3-14] [2003-10-11 09:00 - 12:30 / Grand Ballroom Pre-function]

Effects of subacute oral administration of endocrine disruptors, bisphenol A and Mancozeb, on LPS-induced tumor necrosis factor (TNF-α) production in vivo.

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Bisphenol A(BPA) is a monomer widely used in the manufacturing polycarbonate plastic or epoxy resin and Mancozeb (MCZ), a polymeric complex of zinc and manganese salts of ethylene bisthiocarbamate, is widely used in agriculture as fungicide, insecticide and herbcide. These chemicals have been recently known as endocrine disruptors. To investigate the effects of BPA and MCZ on LPS-induced cytokine production (TNF-α) in vivo, female ICR mice were administered to various concentration of these materials (BPA; 100, 500, 1000 mg/kg/day, and MCZ; 250, 500, 1000, 1500 mg/kg/day) for 30 days and serum cytokine levels were measured at 1h post LPS injection (day 32) in BPA- or MCZ-administered mice. Treatment with endocrine disruptors plus LPS in vivo resulted in dose-dependently decreased serum TNF-α level when compared to LPS alone group. These results indicate that endocrine disruptors might inhibit the production of TNF-α in vivo.