expressions, and NO and ONOO- productions. In order to demonstrate whether ROS are involved in HNE-induced apoptosis, N-acetylcysteine (NAC), ROS scavenger, was used in this study. The results indicated that the apoptosis-inducing HNE was inhibited by NAC. Therefore, the oxidant activity might be involved in HNE-induced apoptosis. These data suggest that HNE contributes to induce apoptosis on YPEN-1 cells.

[PC3-5] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

Ircinin-1 from the Sponge *Sarcotragus* sp. Induces of Apoptosis in SK-MEL-2 Human Skin Cancer Cells

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The marine sponge of the genus *Petrosia* sp. is known to contain unique metabolites such as furanoterpenoids. These furanoterpenoids have been reported to possess various bioactivities. We have shown previously that ircinin-1 induced cell cycle arrest and apoptosis in SK-MEL-2 human skin cancer cells dose- and time-dependently. In this study, we demonstrated that ircinin-1-induced apoptosis is accompanied by cleavage of poly(ADP-ribose) polymerase protein and PLC-γ1 degradation and release of cytochrome *c* from mitochondria to cytosol. This was associated with the cleavage/activation of caspase-3 and caspase-9 proteins. Even though the inhibitor of apoptosis protein (IAPs) was expressed in ircinin-1-untreated or -treated SK-MEL-2 cells, only cIAP-1, but not XIAP or cIAP-2, was cleaved during ircinin-1-induced apoptosis at Western blot and RT-PCR studies. These findings suggest that the ircinin-1-induced apoptosis was conducted by the mechanism that interferes with activity of caspase-3 and the downregulation of IAPs.

[PC3-6] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

Comparison on the effects of Cytotoxicity and Quinone Reductase Inducing Activity from Porphyra tenera and Enteromorpha linz

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The seaweed, as source of bio-active substances as well as food, has received much attention in recent years. This study was carried out to determine the cytotoxic and chemopreventive effects of Porphyra tenera (PT) and Enteromorpha linza (EL). The PT and EL extracts from methanol were fractionated to five different types, which are hexane, ethylether, ethylacetate, butanol and water. Cytotoxicity of PT and EL extracts was determined by MTT assay using HepG2, C6, MCF-7 and HT29 cell lines. Among the various fractions, hexane(PTMH) and aqueous(PTMA) fractions of PT were showed significant cytotoxic effects on the all cancer cell lines which we used. From the results of quinone reductase (QR)-inducing activities using HepG2 cells, expecially hexane fractions at a dose of 100 ug/mL in PT was 4.6 times more effective compared to the control of 1.0. In general, the effect of cytotoxicity and QR to the five different types of EL showed less effective than the fractions of PT. Therefore, based on these studies, the PTMH and PTMA may be developed into potentially useful bio-active materials for

health.

[PC3-7] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

ROLES OF NADPH OXIDASE AND COX-2 IN UVB-INDUCED MMP EXPRESSION IN HaCaT HUMAN KERATINOCYTES.

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Ultraviolet (UV) irradiation is well known to cause human skin aging and skin cancer through activation of matrix metalloproteinases (MMPs) which are responsible for the degradation of collagen, an extracellular matrix component. However, the molecular mechanisms of UV-induced MMP expression are yet to be defined. In this study, we investigated signaling molecules involved in UV-induced MMP expression in HaCaT human keratinocytes. UVB irradiation increased the generation of superoxide radical and lipid peroxidation. In addition, UVB enhanced MMP-1, MMP-2, and MMP-9 expression in a time-dependent manner. Pretreatment with N-acetylcysteine, trolox, general antioxidants, or DPI, neopterine and apocynin, NADPH oxidase inhibitors reduced VUB-induced superoxide radical release and expression of MMP-1, MMP-2, MMP-9, whereas malonate, hydroxyurea, rotenone, NMMA and FCCP had no effect on either ROS release nor MMP expression. In addition, UVB increased COX-2 expression. Furthermore, indomethacin, a nonselective COX-2 inhibitor reduced UVB-induced MMP-1, MMP-2, and MMP-9 expression and ROS production. These data suggest that NADPH oxidase and COX-2 play important roles in VUB-induced MMP level though reactive oxygen species generation.

[PC3-8] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

The efficient Erythropoietin expression system in Chinese Hamster Ovary cells by introduction of urea cycle enzymes

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The efficient EPO (Erythropoietin) expression system in Chinese Hamster Ovary (CHO) cells was devised through the removal of ammonium ion accumulated in the media by introducing urea cycle enzymes. Previously, we developed CO5 cell by transfecting the carbamoly phosphate synthase (CPS) and ornithine transcarbamoylase (OTC) into the EPO expressing CHO cell, IBE. This study showed that CO5 had 17%, 18%, and 21% higher cell viability and 17%, 20% and 21% lower ammonia concentration per cell than IBE on condition that media were changed on every 24hr, 48hr and 72hr, respectively. Also, productivity of EPO in CO5 was 97%, 116% and 125% higher than that in IBE when media were changed on every 24hr, 48hr and 72hr, respectively. These results showed that CO5 expressing CPS and OTC was superior to IBE on cell viability, reduction of ammonia concentration and EPO production on condition that media were changed with 72hr interval than that with 24hr and 48hr interval. These results support that reduction of ammonium ion accumulated in the media is proportional to EPO production and cell viability. EPO were purified by DEAE and affinity column to examine carbohydrates moiety of glycoprotein quantitatively. Comparisons of glycosylation of EPO purified from IBE and CO5 is currently in progress by IEF(isoelectric focusing gel) and quantitative sialic acid analysis.