Peroxynitrite Scavenging Activity of Sinapic Acid from Brassica juncea

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Peroxynitrite ($ONOO^-$), formed from the reaction of superoxide ($O_2\cdot^-$) and nitric oxide ($\cdot NO$), is one of cytotoxic species that can oxidize several cellular components such as proteins, lipids, and DNA. It has been reported to be implicated in diseases such as Alzheimer's disease, rheumatoid arthritis, cancer, and atherosclérosis. Due to the lack of endogenous enzymes responsible for $ONOO^-$ inactivation, to develop a specific $ONOO^-$ scavenger is of considerable importance. The aim of this study was to evaluate the ability of natural products to scavenge $ONOO^-$ and to protect cells against $ONOO^-$. More than 100 plant-extracts were tested for their $ONOO^-$ scavenging activity. Among them, extracts from *Brassica juncea* showed higher activity in $ONOO^-$ scavenging. In further analysis, the active components sinapic acid and its glucoside, kinds of phenolic compounds, were identified as potent $ONOO^-$ scavengers. Specially, the aglycone type sinapic acid was more effective than its glucoside. The data from spectrophotomitric analysis demonstrated that sinapic acid led to the decrease of $ONOO^-$ mediated nitration of tyrosine through electron donation. Sinapic acid also showed significant inhibition on nitration of bovine serum albumin and low-density lipoprotein by $ONOO^-$ in a dose-dependent manner. Its cytoprotective effect against $ONOO^-$ is under further study. Sinapic acid can be developed as an effective $ONOO^-$ scavenger for the prevention of the $ONOO^-$-involved diseases.

[PC1-21] [10/19/2001 (Fri) 09:00 - 12:00 / Hall D]

The chestnut inner shell extract enhances the expression of adhesion molecules, fibronectin and vitronectin, of skin fibroblasts in culture

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The ethanol extract of chestnut inner shell has been used for anti-wrinkle/skin firming agent in East Asia, and this extract was found to prevent the cell detachment of skin fibroblasts from cell culture plate in preliminary experiment. In order to elucidate the molecular mechanisms underlying this phenomenon, effects on adhesion molecules such as fibronectin and vitronectin were investigated. The chestnut inner shell extract enhanced the expression level of fibronectin and vitronectin without enhancing other protein levels(b뺐ctin) from mouse skin fibroblast(NIH/3T3). The enhancement of these protein expression was verified by fixed-cell ELISA, western blot and immunostaining. Scoparone (6,7-dimethoxycoumarin) isolated from the extract also possessed similar property. These findings strongly suggest that the enhanced expression of adhesion molecules may be, at least in part, one of molecular mechanisms of the chestnut inner shell extract preventing the cell detachment and may be also responsible for its anti-wrinkle/skin firming effect when topically applied.

[PC1-22] [10/19/2001 (Fri) 09:00 - 12:00 / Hall D]

Inhibition of TPA-induced cyclooxygenase-2 expression and skin inflammation in mice by wogonin, a plant flavone from Scutellaria radix

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Wogonin (5,7-dihydroxy-8-methoxyflavone), isolated from Scutellaria radix, was previously reported to inhibit the expression and activity of cyclooxygenase-2 in lipopolysaccharide stimulated cells of a mouse macrophage cell line, RAW 264.7. Here, in order to find in vivo effects, inhibition by wogonin of 12-O-tetradecanoylphorbol-13-acetate (TPA)-induced cyclooxygenase-2 expression and anti-inflammatory activity in vivo were investigated. When applied topically to the dorsal skin of mice, wogonin at doses of 50 ?200 mg/site/treatment (total five treatments in three days) inhibited cyclooxygenase-2 expression and prostaglandin E2 production induced by multiple treatments with TPA. At 200 mg/site/treatment, wogonin caused a 55.3% reduction of prostaglandin E2 production on the dorsal skin compared with an increased production in the TPA-treated control group. The same compound significantly inhibited mouse ear edema induced by TPA in both preventive (58.1% inhibition) as well as curative treatment (31.3% inhibition) schedules at 200 mg/ear/treatment. Inhibition of neutrophil infiltration was also observed. Therefore, wogonin may be beneficial for cyclooxygenase-2-related skin disorders.

[PC1-23] [10/19/2001 (Fri) 09:00 - 12:00 / Hall D]

Effects of Ginkgetin from Ginkgo biloba Leaves on Cyclooxygenases and In Vivo Skin Inflammation

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Ginkgetin, a biflavone from Ginkgo biloba leaves, was previously reported to be a phospholipase A2 inhibitor and this compound showed the potent antiarthritic activity in rat adjuvant-induced arthritis as well as analgesic activity. This investigation was carried out to find effects on cyclooxygenase (COX)-1 and ? including in vivo effect. Ginkgetin (1 ?10 uM) and the biflavonoid mixture (10 ?50 ug/ml), mainly 1:1 mixture of ginkgetin and isoginkgetin, from G. biloba leaves, inhibited production of prostaglandin E2 from lipopolysaccharide-induced RAW 264.7 cells. This inhibition was mediated, at least in part, by down-regulation of COX-2 expression, but not by direct inhibition of COX-1 or COX-2 activity. Down-regulation of COX-2 by ginkgetin was also proved in the dorsal skin of ICR mouse treated by 12-O-tetradecanoylphorbol-13-acetate (TPA). At total doses of 1,000 ug/site on the dorsal skin (15 mm ?15 mm), ginkgetin inhibited prostaglandin E2 production by 65.6% along with marked suppression of COX-2 induction. In addition, ginkgetin and the biflavonoid mixture (100 ?1,000 ug/ear) dose-dependently inhibited skin inflammation of croton oil induced ear edema in mice by topical application. Present study suggests that ginkgetin from G. biloba leaves down-regulates COX-2 induction in vivo and this down-regulating potential is associated with anti-inflammatory activity against skin inflammatory response.

[PC1-24] [10/19/2001 (Fri) 09:00 - 12:00 / Hall D]

Characterization of a gene cluster responsible for catechol catabolism in Pseudomonas cepacia G4

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Pseudomonas cepacia G4 is a soil bacterium that can grow in toluene, cresol or phenol as the sole carbon and energy source. A recombinant plasmid encoding a gene cluster responsible for degradation of the aromatic xenobiotics was isolated from a total DNA library of P. cepacia G4 and designated as pCNU301. The pCNU301 contained tomBCEGFD gene cluster which can encode 6 enzymes catabolizing catechol to acetyl-CoA. In this study, nucleotide sequences of tomFD gene encoding 4-hydroxy-2-