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The transmission of signals derived from T cell stimulation leads to the activation of the Ca^{+2}-calcineurin pathway, which in turn triggers the translocation of NFAT to the nucleus. NFAT is a family of transcription factors present in cells and tissues of the immune system. Upon calcium signalling, the Ca^{+2}-calmodulin dependent phosphotase calcineurin dephosphorylates NFAT proteins leading to the unmasking of the nuclear localization sequences and the translocation of NFATs to the nucleus. The Jurkat cell line containing the NFAT dependent transcriptional reporter gene, SEAP, was used to find the inhibitor of the NFAT transcription activity from medicinal plants. Hundreds of plant extracts were screened on the inhibitory activity against the NFAT transcription activity. Among them, the MeOH extract of *Cnidium officinale* showed a potent inhibitory effect against the NFAT transcription activity without the effect of NF-κB transcription. Several compounds were isolated by the bioassay-directed isolation procedure from the MeOH extract of *Cnidium officinale*. Their structures were elucidated by physicochemical and spectral data.

[PD2-17] [04/20/2001 (Fri) 13:30 - 14:30 / Hall 4]

A rare C-methylated flavonoid glycoside from the leaves of Pinus densiflora

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Red pine, the *Pinus densiflora* Sieb. et Zucc. (Pinaceae) grows naturally or is planted in mountain regions of Korea, Japan and China. The leaves of red pine have long been used as a nourishing tonic drug in Korean folk medicines. The pine leaves are frequently used to brew a tea in Korea. Previously we reported that the methanolic extract of the leaves of *P. densiflora* exerts radical scavenging effect on 1,1-diphenyl-2-picrylhydrazyl radicals. From this methanolic extract, (+)-catechin was isolated as one of active principles, together with the inactive components, dihydrokaempferol, and 1-*O*-benzoyl glucoside. In the course of continuous work on this plant, a new *C*-methyl flavonol glucoside **(1)** along with kaempferol 3-*O*-galactoside **(2)** and its 6"-acetate **(3)** were isolated. The structure of the new flavonol was characterized as 5,7,8,4'-tetrahydroxy-3-methoxy-6-methylflavone 8-*O*-β-D-glucopyranoside from spectroscopic evidences.

[PD2-18] [04/20/2001 (Fri) 13:30 - 14:30 / Hall 4]

Structure of Codonoposide Isolated from Codonopsis lanceolata Roots and the Cytotoxic Activity of Prosapogenins

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Roots of Codonopsis lanceolata (Campanulaceae) have been used as tonics in the Korean traditional medicine. We have isolated a new saponin named codonoposide (1, 3-O-[beta-D-xylopyranosyl(1-3)-beta-D-glucuronopyranosyl]-3beta,24,16alpha-trihydroxyolean-28-oic acid 28-O-[beta-D-xylopyranosyl(1-3)-alpha-L-rhamnopyranosyl(1-2)-alpha-L-galactopyranosyl] ester). Partial hydrolyses of 1 afforded a sapogenin (1a) and two prosapogenins (1b, 1c), and the structures of hydrolysates (1a, 1b, 1c) were established by spectroscopic data. The structures were found to be 3beta,24,16alpha-trihydroxyolean-28-oic acid (1a), 3-O-beta-D-glucuronopyranoside of 1a and 3-O-beta-D-xylopyranosyl(1-3)-beta-D-glucuronopyranoside of 1a, respectively. On MTT assay, 1c

showed potent cytotoxic activity (IC50, 11.8 microg/ml against 3LL cell) whereas 1b exhibited the cytotoxicity (IC50, 69.6 microg/ml against 3LL cell) less than of 1c. However, the bisdesmosyl saponin (1) exhibited no cytotoxicity (IC50, >150 microg/ml against 3LL cell). This result indicated that glycoside linkage of glucuronic acid at C-3 enhances the cytotoxicity of sapogenin (1a) and that additive glycosylation of xylose to 1b strongly enhances the cytotoxicity of 3-O-monosaccharide of 1a (1b). Therefore, the most biologically active moiety of the saponin (1) was attributable to be 3-O-disaccharide of 1a (1c).

[PD2-19] [04/20/2001 (Fri) 13:30 - 14:30 / Hall 4]

Structures of Three New Terpenoids, Spiciformisins a and b, and monocyclosqualene, Isolated from the Herbs of Ligularia fischeri var. spiciformis and Cytotoxicity

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The plant Ligularia fischeri var. spiciformis (Compositae) is a candidate for available functional foods. We have reported the isolation of an eremophilanolide named 6-oxoeremophilenolide, a cytotoxic intermedeol and dicaffeoylquinic acids from this plant. For further isolation of cytotoxic terpenoids, diethyl ether fraction was subjected to silica gel column chromatography and yielded three new terpenoids named spiciformisins a and b, and monocyclosqualene. Structures of acyclic diterpenes, spiciformisins a and b, were established as 6,7,10,11,14,15-hexahydro-beta-springene and 4-dehydro-17-hydro-beta-springene, respectively. A monocyclic triterpene, monocyclosqualene, was determined as 3,8,12,16,16-pentamethyl-3,7,11,15-hexadecatetraenyl-3,3,5-trimethyl-1-cyclohexene. The structures were determined on the basis of NMR and MS analysis. Spiciformisin b with a partial structure of trans-conjugated dienyl exomethylene showed potent cytotoxicity (IC50, <9.7 microg/ml against HL-60) in contrast to no cytotoxicity (IC50, >200 microg/ml against HL-60) of spiciformisin a with a cis-conjugated dienyl diexomethylene. In addition, monocyclosqualene with endo-olefin exhibited significant cytotoxicity (IC50, 15.8 microg/ml against HL-60).

[PD2-20] [04/20/2001 (Fri) 13:30 - 14:30 / Hall 4]

Isolation of lectin from Korean mistletoe and its apoptosis-inducing activity

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The lectins (KML-C) were isolated from an extract of Korean mistletoe [Viscum album C. (coloratum)] by affinity chromatography on a hydrolysed Sepharose 4B, and the chemical and biological properties of KML-C were examined. The hemagglutinating activity of KML-C was inhibited by N-acethyl D-galactosamine and D-galactose at the minimum concentration of 6.3 and 12.5 mM/ml, respectively. Further biochemical analyses indicated that KML-C consists of four chains (Mr = 27.5, 30, 31 and 32.5 kDa) which, in some of the molecules, are disulfide-linked, and that the chains of KML-C are distributed in broad range of isoelectric point (pI), 8.0 to 9.0, whereas EML-1 is in the range of 6.6 to 7.0. The difference between KML-C and EML-1 was also observed in comparison of N-terminal sequence of both lectins. The isolated lectins showed strong cytotoxicity against various human and murine tumor cells, and the cytotoxic activity of KML-C was higher than that of EML-1. Tumor cells treated with KML-C exhibited typical patterns of apoptotic cell death, such as apparent morphological changes and DNA fragmentation, and its apoptosis-inducing activity was blocked by addition of Zn2+ an inhibitor of Ca2+/Mg2+-dependent endonucleases, in a dose-dependent manner. These results