squalene synthases gene derived from panax ginseng

Seo Jin-Wook°, Jeong Jae Hun, Han Sung Tai, Lee Hak Sung, Choi Yong Eui, Shin Cha-Gyun
Department of Biotechnology, Chung-Ang University, Korea Ginseng Institute, Chung-Ang University

Transgenic Eleutherococcus senticosus plants were prepared by introducing the genes for squalene synthase (SQS), hygromycin phosphotransferase (HPT) and green fluorescent Protein (GFP) through Agrobacterium–mediated transformation. The enzyme, SQS, represents a putative branch point in the isoprenoid pathway capable of diverting carbon flow specifically to the biosynthesis of phytosterol and oleanolic acid. The full SQS gene was isolated from P. ginseng roots. Early globular embryo clusters developed from embryogenic callus were used as the explant source. Following infection, selection was achieved on hormone-free MS medium containing 300-mg/l cefotaxime and 25-mg/l hygromycin at 2-week intervals. Somatic embryos were germinated and converted into plantlets after the cotyledonary embryos were pretreated with 14.4 mM GA_3. Establishment of transgenic somatic embryos was confirmed by presence of SQS and HPT genes, green fluorescence of GFP, and increased SQS enzymatic activity. The SQS enzyme activity of transgenic plant was 3 times higher than the wild type. In addition, a gas chromatographic analysis revealed that phytosterol (b-sitosterol and stigmasterol) levels in transgenic E. senticosus were increased remarkably. These results suggest that the SQS gene may play a regulatory role for phytosterol synthesis, and the produced transgenic E. senticosus plantlet can be used as the sources of medicinal raw materials.

[PC1-13] [2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function]

Antioxidant Activity of major protein from Panax Ginseng C.A. Meyer.

Kim Min Jung°, Sok Dai-Eun
Kointec, *College of Pharmacy, Chungnam National University*

A major protein was isolated from ginseng root (Panax ginseng C.A. Meyer) using a combination of ammonium sulfate fractionation, gel filtration chromatography, ion-exchange FPLC. Electrophoretic and gel permeation chromatographic studies revealed that the major protein, GMP, is composed of two subunits of approximately 28 kDa. In this study, investigated the ability of GMP to inhibit the oxidation of low-density lipoprotein (LDL). GMP inhibited Cu^{2+} (5 μM)-promoted oxidation of LDL (125 μg protein/mL) in a dose-dependent mamer (0~5 μM), with a maximal inhibitor at GMP/copper ratio of 1:10 and an IC_{50} value of 0.2 μM, as determined by measurement TBARS. Meanwhile, bovine serum albumin (BSA) and histidine showed IC_{50} value of 2.4 μM and 8.0 μM, respectively. In related experiment, GMP was more effective than histidine in preventry against Cu^{2+}-induced formation of carbonyl in BSA, but the reverse in preventry Cu^{2+}-induced oxidation of ascorbic acid. However 2,2'-azobis (2-amidinopropane) dihydrochloride (AAPH)(1mM)-induced oxidation of LDL was not inhibited by ether GMP or histidine. These data suggest that the antioxidant action of GMP against Cu^{2+}-promoted LDL oxidation might the mainly due to the selective interaction with Cu^{2+} associated with LDL.

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Inhibitory effect of benzoxathiol LYR-71 compound on inflammatory enzymes and cytokines

Min Hee Kim°, Yong Rok Lee, Kyung Rak Min, Youngsoo Kim
College of Pharmacy, Chungbuk National University, School of Chemical Engineering & Technology, Yeungnam University

The benzoxathiol LYR-71 compound was discovered as an inhibitor of NF-kB transcriptional activity with an IC50 value of 5.4 uM. Furthermore, benzoxathiol LYR-71 compound inhibited the NF-kB binding activity to DNA in a dose-dependent manner, which was identified by EMSA with oligonucleotide corresponding to NF-kB consensus sequence. It is well known that NF-kB is an important transcription factor to regulate the expression of inflammatory enzymes (iNOS and COX-2) and cytokines (TNF, IL-1 and IL-6). The benzoxathiol LYR-71 compound suppressed all expressions of iNOS, COX-2, TNF, IL-1 and IL-6 transcripts in LPS-stimulated murine