Study on safety of genetically modified(GM) foods- Allergenecity of genetically modified soybean

Park JH°, Chung ST, Kim JH, Kim DS, Noh GW, Oh HY and Kim HS

National institute of Toxicological Research, Korea Food and Drug Administration, Seoul 122-704, Korea

There are still argument for the safety of GM foods although genetically modified organism(GMO) using recombinant DNA technology has been exponentially increased. This study was designed to compare the potential allergenicity of GM soybean(Roundup ReadyTM) with natural soybean varieties. Positive sera from 20 soybean-sensitive patients and control sera from 5 normal subjects were used to identify the endogenous allergens in soybean. Soybean extracts were prepared as crude, heated, heated and gastric fulid (SGF)-digested samples to characterize the stability of allergens to physicochemical treatment. Specific-IgE binding activities to each soybean preparation were evaluated by ELISA and immunoblot technique. In ELISA result, IgE binding activity of positive sera to soy crude extract generally showed tow fold higher mean value than that of control sera, however there was no significant difference between GM soybean and natural soybean varieties. Extracted proteins form each of th soybean preparations were separated with SDS-PAGE, The band pattern for GM soybean was very similar to that of natural soybean varieties. Immunoblots for the different soybeans revealed no differences in IgE-binding protien patterns, moreover, disclosed five prominent IgE-binding bands(75, 70, 50, 44 and 34 kDa) in crude extract, four(75, 70, 44 and 34 kDa) in heated preparation, one(50 kDa) in heated and SGF-digested preparation. These IgE binding bands were consistent with previously reported results on soybean. These results indicate that GM soybean (Roundup ReadyTM) is no different from natural soybean in terms of its allergenic potential.

Poster Presentations - Field B1. Physiology

[PB1-1] [04/19/2001 (Thr) 15:30 - 16:30 / Hall 4]

Effects of flavonoid fractions isolated from Scutellaria baicalensis, Euginia aromaticz, Betula mandshrica on antibody productivity, metabolism of unsaturated fatty acid and lipid hydroperoxides

Lim BO, Kim HC, Cho KH, Suk KH, *Shin HM, Kim SY

Dept. Herbal Pharmacology, Graduate School of East-West Medical Science, Kyunghee Uni., *Dept of Physiology, College of Oriental Medicine, Dongguk Uni.

After oral administering with three crude drugs such as 100mg and 1,000mg of Scutellaria baicalensis (S.bai), Euginia aromaticz (E.aro), Betula mandshrica (B.man) to Sprague-Dawley rats for 5 weeks, biochemical studies were done.
On total fatty acid in spleen, flavonoid fractions from three crude drugs showed a trend of increasing the proportion of 20:4n-6 and decreasing of 18:2n-6 suggesting their relation with metabolism of linoleic acid and regulating the eicosanoid production in the polyunsaturated fatty acid metabolism. IgG was significantly increased in spleen of S.bai and B.mand, while IgM was significantly suppressed S.bai and E.aro treated groups as compared with control. On the other hand, S.bai had a strong activity on the IgG in mesenteric lymph node lymphocytes. Cholesterol level was effectively reduced in order of B.mand and S.bai at 5 weeks after adminstration with flavonoid components of three crude drugs. Phospholipid was significantly lowered in S.bai and B.mand, while triglyceride was also reduced only in S.bai-treated group. B.mand was most effective in reducing phospholipid

hydroperoxide as a potent antioxidant.
Thus, the flavonoid components of crude drugs could be applied to regulating the eicosanoid and antibody production, inhibiting the lipid peroxide.

[PB1-2] [04/19/2001 (Thr) 15:30 - 16:30 / Hall 4]

Silica-Induced Phospholipase A2 Activation in Raw 264.7 Cells

Lee SJ, Seo MH, Jang YU, Yoon JY, Cho JH, Kim CJ, Sim SS

College of Pharmacy, Chung-Ang University

Silica which is a typical fibrogenic particles in many occupations including coal mining, quarrying and sandblasting induced acute inflammatory response and fibrosis in lung. To investigate the mechanism of phospholipase A2 (PLA2) activation induced by silica, we observed the effects of protein kinase inhibitors on silica-induced PLA2 activity in Raw 264.7 cells. Silica caused PLA2 activation in a dose- and time-dependent manner in Raw 264.7 cells. Silica-induced PLA2 activation was significantly inhibited by a variety of phospholipase inhibitors, such as manoalide (1 μM), neomycin (100 μM), U73122 (1 μM) and propranolol (200 μM). Also it was dose-dependently inhibited by various protein kinase inhibitors, bisindolmaleimide (protein kinase C inhbitor), tyrosine kinase inhibitors (genistein and DHC), calmodulin antagonists (W-7 and trifluoperazine), calmodudlin-dependent protein kinase II inhibitor (KN62) and mitogen-activated protein kinase kinase (MAPKK) inhibitor (PD098059), whereas it was not affected by forskolin, sodium nitroprusside and nitric oxide synthase inhibitor (L-NAME and L-NNA). These results indicate that inflammatory response induced by silica may be mediated via various signal transduction pathway. Considering complex action of silica on inflammatory response, it is difficult to find therapeutics for silica-induced inflammation.

Poster Presentations - Field B2. Pathology

[PB2-1] [04/19/2001 (Thr) 15:30 - 16:30 / Hall 4]

Anti-inflammatory Activity of Phenylpropanoids on the Carrageenan-induced Paw Edema

Kim CJ, Lee SJ°, Seo MH, Yoon JY, Jang YW, Cho JH, Sim SS,

Department of Pathophysiology, College of pharmacy, Chungang University

Phenylpropanoids, C6-C3 compounds are widely distributed in vegetable kingdom. There are currently a great deal of interest in the health benefits of phenylpropanoids, through their potential anti-oxidant, anti-inflammatory and anti-aggregatory properties. The phenylpropanoids have scavenging activity of oxygen free radical which is shown in the flavonoids. In this study, the structure-activity relationship of phenylpropanoids in anti-inflammatory effect was evaluated in the carrageenan-induced paw edema of rats. The volume of the hind paw after intradermal injection of 0.1 ml of 1 % carrageenan in a subplantar of right hind paw was measured by plethysmometer for 4 hrs. It shows that all of phenylpropanoids have dose-dependently anti-inflammatory activity at a oral dose of 12.5mg/kg. Caffeic acid have the most activity, but their activity was less cative than indomethacin and ibuprofen. Their efficiency of anti-inflammatory action in the order: caffeic acid > chlorogenic acid > p-coumaric