Epigallocatechin Gallate inhibits Prostaglandins Generation by Suppression of cPLA2 Activity on Arachidonic Acid Metabolism in LPS–Stimulated RAW264.7 Cells

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Green tea contains several antioxidants including polyphenols of the catechin, which have been shown to act in vitro and in vivo as anti-inflammatory, anti-viral and anti-tumor drugs. Prostaglandins (PGs) are a family of intercellular and intracellular messengers derived from arachidonic acid (AA) by phospholipase (PL) and cyclooxygenase (COX). These mediators exert a wide range of effects on processes such as smooth muscle tone, vascular permeability, cellular proliferation, and inflammatory/immune function. In this study, Epigallocatechin gallate (EGCG), a major compound of green tea catechins, reduced the generations of PGE2 and PGD2 in RAW264.7 cells stimulated by lipopolysaccharide (LPS) in a dose-dependent manner when added to the culture media at the time of stimulation. In order to elucidate the mechanism involved in the anti-inflammatory activity of EGCG, we investigated its effects on the AA metabolism and enzyme activity such as cPLA2, sPLA2, and COX activity, and protein expression such as cPLA2, COX2 expression. In the results, LPS stimulated the generations of PGE2 and PGD2 in RAW264.7 cells in a dose- and time-dependent manner. EGCG inhibited cPLA2 activity, but did not suppress the sPLA2, or COX–activity in LPS–stimulated RAW264.7 cells. Furthermore, EGCG did not affect the cPLA2, or COX2–expression. These results suggest that EGCG may inhibit the generations of PGE2 and PGD2 through the suppression of the cPLA2 activity in LPS–stimulated RAW264.7 cells.

Antidiabetic effect and mechanisms of SPH–2 in db/db mice

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SPH-2 is a herbal medicine composing oriental prescription. We have studied the antidiabetic effect and mechanism of SPH-2 in insulin–resistant diabetic db/db mice. Mice were grouped and treated for 3 weeks as follows: control group was administrated with tap water orally; treated group was administrated with SPH-2 orally at dose of 500 mg/kg. SPH-2 lowered plasma glucose level by 43% as compared to the diabetic control. Total cholesterol, triglyceride and free fatty acid were all reduced in SPH-2 treated group. The control group showed hyperinsulinemia, whereas SPH-2 treatment decreased insulin level at the end of treatment. SPH-2 treated mice also exhibited low urinary glucose and albumin level as compared to the diabetic control, in parallel to the plasma glucose concentration. In the mechanism study, PPARα mRNA expression in epididymal fat were increased in SPH-2 treated group. GLUT4 mRNA expressions in skeletal muscle was also increased in SPH-2 treated group. We have also investigated glucose-6-phosphatase, phosphoenolpyruvate carboxykinase, and glucokinase activities in liver. There were significant differences between control and treatment group in these parameters. From these result we may conclude that SPH-2 showed the excellent antidiabetic activity probably due to improvement of insulin resistance.
Studies on Anti-inflammatory effect of Clerodendron trichotomum Thunberg Leaves
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The leaves of Clerodendron trichotomum Thunberg(CTL) is used in Chinese folk medicine for anti-inflammatory properties. We studied on the anti-inflammatory effects of CTL extracts in rat, mouse and Raw 264.7 cell. 1mg/kg of 30%, 60% methanol fraction of CTL and 1mg/kg of indomethacin as the standard anti-inflammatory drug were administrated into rats, respectively. Carrageenan was injected subcutaneously to induce hind paw edema in rats. The result of carrageenan−induced rat paw edema showed that 1mg/kg of 30%, 60% methanol fraction of CTL and 1mg/kg of indomethacin inhibited hind paw edema by 19.5%, 23% and 20.5%, respectively. The effect of CTL against inflammation in mice using a capillary permeability assay was examined by detection of Evans blue leakage from the capillaries after intraperitoneal injection of acetic acid, a potent inflammatory stimulus. 60% methanol fraction of CTL inhibited Evans blue dye leakage by 47% that was 10% higher inhibition than 1mg/kg of indomethacin. Also, 60% methanol fraction of CTL suppressed prostaglandin E2(PGE2) generation in RAW 264.7 macrophage cell as much as indomethacin after treatment of lipopolysaccharide, leading to the synthesis of PGE2 by COX−2 induction. The inhibition of the carrageenan−induced rat paw edema, vascular permeability and PGE2 generation demonstrates that 60% methanol fraction of CTL contains a strong anti-inflammatory activity.

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Hypoglycemic Effect of Ginseng Radix alba(GRA) in Multiple Low Dose Streptozotocin−induced Diabetic Rats

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Purpose: Hypoglycemic effect of GRA was examined in multiple low dose(MLD) streptozotocin(STZ)−induced diabetic rats with regard to time of administration. Experimental methods: 20 mg/kg of STZ in 100 mM citrate buffer(pH 4.5) was injected intraperitoneally for 5 consecutive days. In co−treatment groups, GRA was administered intraperitoneally for 3 weeks at dose of 150 or 300 mg/kg. After induction of hyperglycemia, post treatment groups were also received GRA(150 or 300 mg/kg) intraperitoneally for 3 weeks. Blood glucose and body weight were measured every 3 day. At 3 weeks of treatment, plasma insulin was determined. Rats were sacrificed at the end of treatment, kidney was removed and index of kidney hypertrophy was calculated. Pancreas was also picked out and then immunohistochemistry for insulin content was also performed.

Results: GRA delayed or prevented developments of STZ−induced diabetes in co−treatment groups. A hypoglycemic effect was displayed in all of GRA−treated groups. Blood insulin level was recovered by treatment with GRA. Kidney hypertrophy in MLD STZ−induced diabetes was improved by GRA. Taken together, we may conclude that GRA showed significant hypoglycemic activity in the post−treatment groups as well as preventing development of diabetes in co−treatment groups. In addition, no more than 150 mg/kg of GRA may be required to improve hyperglycemia.

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Immunosuppressive activity of Allergina

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