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Biological profile of a novel cholesterolic cationic lipids

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The most commonly used hydrophobic groups used for cationic lipids are steroid derivatives and straight chain hydrocarbons. In the steroid groups, cholesterol is by far the most frequently encountered. Cholesterol is one of the most widely distributed natural materials for the tail lipid part and has a unique chemical structure such as a steroid skeleton. The archetypal cationic lipid DC-Chol, as well as newer lipids such as BGTC(Bis-guanidinium-tren-cholesterol) are examples of cholesterol lipids. Then, novel cholesterol-based cationic lipids were synthesized which has aminopropyl group(s) as the cationic head part. Induced aminopropyl group was synthesized through cyanoethylation and direct catalytic reduction of nitriles with the combination of nickel(II) chloride and sodium borohydride. Liposomes prepared from these new lipids and dioleoyl phosphatidyl ethanolamine(DOPE) in various proportion showed a cytotoxicity as revealed by MTT assays and are efficient to deliver plasmids DNA evaluated by the expression of reporter genes in vitro.

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Synergistic Effects of Rice Bran Oil and Grape Wine Aqueous Fraction on Rats with Hyperlipidemia

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High serum LDL cholesterol concentration is a major risk factor for cardiovascular complication. This risk can be lowered by diet. In this respect foods containing plant sterol or flavonoid can be useful for mildly- and hypercholesterolemic subjects. The purpose of this study was to develop functional food with lowering effects on plasma lipid and cholesterol level. In this study, we carried out screening the cholesterol esterase inhibitory effects of the extracts of several grains and plant fruits. Animal study was also investigated on the effects on the serum lipid levels, lipid peroxide contents, antioxidant enzyme activities and free radical scavenger enzyme system. Animal study showed that aqueous fraction of red wine and rice bran oil fraction (RBO Fr. 2) lowered serum lipid levels, lipid peroxide and hydroxy radical and increased antioxidative enzyme activity, significantly. RBO Fr. 1 consisted of 38.0 g free fatty acids and 6676.6 mg γ -oryzanol per 100 g, whereas RBO Fr. 2 consisted of 65.0 g free fatty acids and 1480.8 mg γ -oryzanol per 100 g. Animal study showed that the composition of γ -oryzanol and other components is important on lowering effects of serum lipid. The mixture of RBO Fr. 2 and wine aqueous fraction showed synergistic positive effects on rats with hyperlipidemia. This work was supported by the 2004 Busan Techno Park Program (BTP), Republic of Korea.

Key word : Pancreas cholesterol esterase, plant sterol, flavonoid, hypercholesterolemia, anti-oxidative enzyme