

## 사포닌 변환에 의한 맞춤형 인삼제품개발

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### Development of Consumer demand Ginseng Products Using Saponin Modification Techniques

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#### ABSTRACT

Ginseng have been traditionally used for strengthening immunity, providing nutrition and recovering health from fatigue. Recently, pharmaceutical activities of ginseng roots have been proven by many researches, and ginseng has become a world-famous medicinal plant. Ginseng saponin, ginsenoside, is one of the most important secondary metabolite in ginseng which has various pharmacological activities.

Many studies have aimed to convert major ginsenosides to the more active minor ginsenoside Rg3 for consumer demand ginseng product. Microbial strain GS514 strain was isolated from soil around ginseng roots for enzymatic preparation of ginsenoside Rg3, which strain shows strong ability of converting ginsenoside Rb1 and Rd into Rg3 in the solution with NaCl. The gene encoding a  $\beta$ -glucosidase from this GS514 was cloned and expressed in the BL21 (DE3) strain of Escherichia coli. The recombinant enzyme was purified and characterized. The molecular mass of purified was 87.5 kDa, as determined by SDS-PAGE. The gene sequence revealed significant homology to the family 3 glycoside hydrolases. The purified single enzyme also catalyzed the conversion of ginsenoside Rb1 into Rg3. This target enzyme will be able to produce as much saponin for consumer demand ginseng product.

Anti-apoptotic proteins bind with pro-apoptotic proteins to induce apoptosis mechanism. Over expression of these anti-apoptotic proteins lead to several cancers by preventing apoptosis. Docking simulations were performed for anti-apoptotic proteins with several ginsenosides from Panax ginseng. Our finding shows ginsenosides particularly Rg3, Rh2 and Rf have more binding affinity with apoptotic proteins. Further, these docking system of each ginsenosides can be extended to experimental screen system for further brief confirmations of several diseases.

**Key words** : Consumer demand ginseng products, Saponin conversion, glycosidase gene, docking system, new ginseng products