

### Biotechnological application of lactic acid bacteria to produce bioactive compounds

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#### Abstract

Lactic acid bacteria (LAB) can be used to produce various bioactive compounds for food uses due to availability of natural or recombinant LAB strains. LAB have been recognized as 'Generally Recognized As Safe' (GRAS) and are likely candidates as a useful microbial cell factory. We employed a wild type or a recombinant strain of *Leuconostoc citreum* as well as the NICE system of *Lactococcus lactis* to convert precursor compounds to bioactive ones such as phenyllactate (a natural antimicrobial compound), ginsenosides (F2 and CK) (an anticancer compound in ginseng) or GDP-fucose (a donor sugar nucleotide to produce fucosylated compounds in human milk oligosaccharides). For enhancement of conversion yields, various biotechnological treatments were given: codon optimization of heterologous genes, whole or permeabilized cells, growing or resting cells, and enzyme-secreting cells. As results, higher conversion rates above 70% were obtained. These studies demonstrate that the LAB cellular system is efficient to increase the health function of foods or pharmaceuticals.

#### Biography

Nam Soo Han obtained his PhD degree at Purdue University USA in 1996. He is currently a professor at the Department of Food Science and Biotechnology, Chungbuk National University in South Korea. He is the director of Brain Korea 21 Center for Bio-Resource Development sponsored by the Korean Ministry of Education. Prof. Han is a member of Advisory Committee of Food Safety Policy in the Prime Minister's Office. He was the chair of the organizing committee for 2014 Dasan Conference, an international conference entitled with 'Current Biotechnology for Industrialization of Functional Foods' hosted by the Korean Federation of Science and Technology Societies. He also serves as a senior editor of Food Science and Biotechnology journal (SCIE) published by Korean Society of Food Science and Technology. His research interests are development and biotechnological application of *Leuconostoc* systems to be used for health functional foods. He has published 145 papers and registered 13 patents.