Biotransformation of the Soy Isoflavone daidzein (7,4'-dihydroxyisoflavone) using *Streptomyces Avermitilis* strain

Su-Hyun Seo, Changhyun Roh, June-Hyung Kim and Byung-Gee Kim
School of Chemical and Biological Engineering, Institute of Molecular Biology and Genetics, Seoul National University, Seoul, South Korea
Tel. +82-2-880-7528, Fax. +82-2-880-1206, E-mail: byungkim@snu.ac.kr

Abstract

The soy isoflavones are naturally occurring phytoestrogens that are found in numerous edible plants, especially including soybeans. They act as chemopreventive agents against cancers, cardiovascular disease, and osteoporosis. There are a growing scientific interests in isoflavones due to these health benefits. Particularly ODI (ortho-dihydroxylisoflavone) is stronger antioxidative activities than those of other isoflavones. Using soy isoflavone daidzein as substrate we have screened isolates of yeast, bacteria, which were isolated from soybean paste and tempe samples for their ability to form ODI. Also, we have examined the capabilities of streptomyces species to transform daidzein for ODI. For the purpose of high-throughput screening, MALDI-TOF mass spectrometry is used as activity based screening method. In result, *Streptomyces Avermitilis* is shown to transform daidzein to hydroxylated isoflavone by hydroxylation reaction. The identity of the metabolite is confirmed using high-performance liquid chromatograph(HPLC), gas chromatograph-mass spectrometry(GC-MS) and ESI-Mass spectrometry as well as MALDI-TOF mass spectrometry.

Reference

1. Sabine E. Kulling, Doris M. Honig, Thomas J. Simat, and Manfred Metzler, Oxidative in Vitro Metabolism of the Soy Phytoestrogens Daidzein and Genistein(2000). J. Agric. Food Chem., 48, 4963-4972.
2. Galal T. Maatooq and John P.N. Rosazza, Metabolism of daidzein by Nocardia species NRRL 5646 and Mortierella isabellina ATCC 38063(2005). Phytochemistry., 66, 1007-1011.