Regiospecific glycosylation of keampferol with glycosyltransferase expressed in E. coli

Ko Jae-hyung, Kim Bong Gyu, Ahn Joong-Hoon
Bio/Molecular Informatics Center, Department of Molecular Biotechnology,
KonKuk University, Seoul
TEL: +82-2-450-3764, FAX: +82-2-3437-6106

Abstract

One of the modifications that plant secondary metabolites are undergone is the glycosylation. Glycosylation which is mediated by glycosyltransferase (GT) has a role in storing the secondary metabolites and defending plants against stress. One of the glycosyltransferase, RGT49 from rice was cloned. It showed the homology with UDP-glucoronosyl and UDP-glycosyltransferase (UDPGT).

RGT49 was functionally expressed as glutathione *S*-transferase fusion protein in *Escherichia coli* and was purified. Ten differen flavonoids were used as a tentative substrate. Reaction product was analyzed by TLC and HPLC. Among them, only keampferol and quercetin, both of which contain 3-hydroxyl group, were undergone the reactions and glycosylated by RGT49. Based on the HPLC retention time and hypsochromic shift, RGT49 is a flavonol-3-*O*-glycosyltransferase.

References

1. Thomas Vogt and Patrik Jones, Glycosyltransferases in plant natural product synthesis: characterization of a supergene family(2000), Vol. 5(9), 380-386.
2. Lim et al, Arabidopsis glycosyltransferases as biocatalysis in fermentation for regioselective synthesis of diverse quercetin glucoside(2004), Biotechnolgy and bioengineering, Vol. 87(5), 623-631.