Functional Analysis *O*-Methyltransferase from *Populus deltoides*

Kim Bong-Gyu and Ahn Joong-Hoon

Bio/Molecular Informatics Center, Konkuk University, Seoul, Korea 143-701
TEL : +82-2-450-3764, FAX +82-2-446-9001

Abstract

O-methyltransferases catalyse the transfer of methyl group from the methyl donor S-adenosyl-L-methyonine to hydroxy of carboxyl group on the wide range of acceptor molecules.

An *O*-methyltransferase, POMT-9, was isolated and characterized from *Populus deltoides*. POMT-9 had an apparent molecular mass of 39.6 for denatured protein, with a pI of 5.88. The blast results of POMT-9 show a 74 % identity with caffeic acid O-methyltransferase from Rosa chinensis var. spontanea and 67 % with (R,S)-reticuline 7-O-methyltransferase from *Papaver somniferum*.. In order to determine the substrate, POMT-2 was expressed in *E. coli* as a GST-tag fusion protein. Several substrates including naringenin, quercetin, daidzein, genisteinm, esuletin, kaempferol, caffeic acid and apigenin were tested. Reaction product was analyzed by TLC and HPLC. It converts quercetin, daidzein, genistein, esculetin, kaempferol, quercetin, naringenin that have hydroxyl group at the 7 position. HPLC analysis result showed that the reaction product of naringenin had a same retention time with sakuranetin (7-methylated Naringenin) indicating that POMT-9 would transfer the methyl group to 7-hydroxyl group of the substrate and is a the 7-*O*-methyltransferases.

References

1. Ibrahim, R. K., Bruneau, A., Bantignies, B., 1998. Plant *O*-methyltransferases: molecular analysis, common signature and classification. Plant Mol. Biol. 36, 1-10.
2. Ibdah, M., Zhang, X.-H., Schnot, J., Vogt, T., 2003. A novel $Mg2^{+}$-dependent *O*-methyltransferase in the phenylpropanoid metabolism of *Mesembryanthemum crystallinum*. J. Biol. Chem. 278, 43961-43972.