ONLINE ISSN : 1880-7291
PRINT ISSN : 1344-7882

Journal of Applied Glycoscience
Vol. 51 (2004) , No. 1 pp.27-32

Heterologous Production and Characterization of *Arthrobacter globiformis* T6 Isomalto-dextranase

Takashi Tonozuka[1)], Saori Suzuki[1)], Yukari Ikehara[1)], Masahiro Mizuno[1)], Yeon-Kye Kim[1)], Atsushi Nishikawa[1)] and Yoshiyuki Sakano[1)]

1) Department of Applied Biological Science, Tokyo University of Agriculture and Technology

(Received September 12, 2003)
(Accepted October 11, 2003)

Efficient production of an isomalto-dextranase from *Arthrobacter globiformis* T6 has been achieved in *Escherichia coli*. The combination of an expression vector lacking the region for the signal peptide, cultivation at 25°C, and optimization of *E. coli* cells allows us to produce the isomalto-dextranase at more than 1000 times the amount under the original conditions, which then enables us to characterize the enzyme in detail. The primary structure of the isomalto-dextranase from *A. globiformis* T6 has a distant similarity with enzymes belonging to glycosyl hydrolase family 27, which comprises mainly α-galactosidases and α-*N*-acetylgalactosaminidases. Therefore, the reaction of the isomalto-dextranase for melibiose, a substrate for α-galactosidases, has also been investigated. The isomalto-dextranase did not hydrolyze melibiose or *p*-nitrophenyl α-D-galactoside. The K_i values for isomaltose and maltose were 2.3 and 7.8 mM, respectively, while melibiose scarcely inhibited the activity of the isomalto-dextranase. Moreover, melibiose was a poor acceptor for the transglycosylation with dextran, and the maximum accumulation of the transglycosylation product was 12-fold less than that for isomaltose. The findings indicated here that the isomalto-dextranase is highly specific for the glucosyl moiety in both hydrolysis and transglycosylation.

Key words: isomalto-dextranase, α-galactosidase, glycosyl hydrolase family 27, signal peptide

To cite this article:

Takashi Tonozuka, Saori Suzuki, Yukari Ikehara, Masahiro Mizuno, Yeon-Kye Kim, Atsushi Nishikawa and Yoshiyuki Sakano: Heterologous Production and Characterization of *Arthrobacter globiformis* T6 Isomalto-dextranase . *J. Appl. Glycosci.*, **51**, 27-32 (2004) .

JOI JST.JSTAGE/jag/51.27