

Product Information

Beta-1,4-galactosyltransferase 1, human
recombinant, expressed in HEK 293 cells

Catalog Number **SAE0093**
Storage Temperature $-20\text{ }^{\circ}\text{C}$

EC 2.4.1.38

Synonyms: B4GALT1, Beta-1,4-GalTase 1, b4Gal-T1, UDP-Gal:beta-GlcNAc beta-1,4-galactosyltransferase 1, UDP-galactose:beta-N-acetylglucosamine beta-1,4-galactosyltransferase 1, Beta4Gal-T1

Product Description

$\beta(1\rightarrow4)$ galactosyltransferase 1 (B4GALT1) is a type II membrane-bound glycoprotein that transfers galactose from uridine diphosphate- α -D-galactose (UDP-galactose) to acceptor sugars, such as *N*-Acetylglucosamine (GlcNAc), in a $\beta(1\rightarrow4)$ linkage. B4GALT1 resides in the Golgi apparatus of higher eukaryotic cells.¹ A major function of B4GALT1 is the addition of $\beta(1\rightarrow4)$ linked galactose residues to oligosaccharide acceptors with terminal *N*-acetylglucosamine residues. This is a late elongation step in the *N*-glycan processing pathway.²

B4GALT1 enzymatic activity is widely distributed in the vertebrate kingdom, in both mammals and non-mammals, including avians³ and amphibians.⁴ B4GALT1 enzymatic activity has also been demonstrated in a subset of plants which diverged from animals an estimated 1 billion years ago.⁵

B4GALT1 interacts with α -lactalbumin (LA), a protein expressed in the mammary gland during lactation, to form the lactose synthase (LS) complex that transfers galactose from UDP- α -D-Gal to glucose, producing the lactose secreted in milk.¹ Defects in B4GALT1 are the cause of congenital disorder of glycosylation type 2D (CDG2D).⁶

Glomerular B4GALT1 expression has been found to be increased in IgA nephropathy. IgA binding and IgA-induced mesangial cell phosphorylation of spleen tyrosine kinase and IL-6 synthesis were inhibited by a panel of $\beta(1\rightarrow4)$ galactosyltransferase-specific antibodies, which suggests that IgA binds to the catalytic domain of $\beta(1\rightarrow4)$ galactosyltransferase.⁷

UniProt: P15291

This product is lyophilized from a 0.22 μm -filtered solution in 25 mM Trizma® HCl, pH 7.9, and 150 mM NaCl. This recombinant human B4GALT1 is expressed in human HEK 293 cells as a glycoprotein with a calculated molecular mass of 40 kDa. The DTT-reduced protein migrates as a ~55 kDa polypeptide on SDS-PAGE because of glycosylation.

This protein is manufactured in human cells, with no serum. The human cells expression system allows human-like glycosylation and folding, and often supports higher specific activity of the protein.

Purity: $\geq 95\%$ (SDS-PAGE)

Specific activity: ≥ 2000 units/mg protein

Unit definition: One unit is defined as the amount of enzyme required to transfer 1.0 nanomole of galactose from UDP-Gal to GlcNAc per minute at pH 7.5, 37 $^{\circ}\text{C}$.

This recombinant B4GALT1 product can be used to study the mode of action of the enzyme, as well as its potential inhibitors. It can also be used as a glycoengineering tool to modify glycoproteins *in vitro*.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

Store the lyophilized product at $-20\text{ }^{\circ}\text{C}$. The product is stable for at least 2 years as supplied.

Preparation Instructions

Briefly centrifuge the vial before opening. Reconstitute in water to a concentration of 0.1 mg/mL. **Do not vortex.** This solution can be stored at 2–8 $^{\circ}\text{C}$ for up to 1 week. For extended storage, it is recommended to store the reconstituted B4GALT1 solution in working aliquots at $-20\text{ }^{\circ}\text{C}$.

References

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