Claims

[Claim 1]

A polypeptide having the following properties (A) and (B):

(A) the polypeptide comprises an amino acid sequence having 75% or more identity and 95% or more similarity to the amino acid sequence shown in SEQ ID NO: 1 and is an amino acid sequence different from the amino acid sequence of SEQ ID NO: 7; and

(B) the polypeptide exhibits, at any temperature from 45 to 60°C, 40% or more of the maximal activity value of hydrolytic activity and/or transglycosylation activity on complex sugar chains.

[Claim 2]

The polypeptide according to claim 1, having the following properties (A) and (B):

(A) the polypeptide comprises an amino acid sequence having 75% or more identity and 95% or more similarity to the amino acid sequence shown in SEQ ID NO: 1 and an amino acid sequence corresponding to the amino acid sequence from amino acid positions 191 to 195 of SEQ ID NO: 1 which is Leu-Ala-Lys-Leu-Leu (LAKLL);

(B) the polypeptide exhibits, at any temperature from 45 to 60°C, 40% or more of the maximal activity value of hydrolytic activity on complex sugar chains.

[Claim 3]

The polypeptide according to claim 1, wherein the hydrolytic activity on complex sugar chains at 50℃ is 60% or more of the maximal activity value.

[Claim 4]

The polypeptide according to any of claims 1 to 3, wherein, in addition to having the properties (A) and (B), (C) the polypeptide is produced in an amount of 10 mg/L of culture or more in recombinant expression in *E. coli*.

[Claim 5]

The polypeptide according to any of claims 1 to 4, wherein the polypeptide has 85% or more sequence identity to the region from amino acid positions 54 to 341 of the amino acid sequence of SEQ ID NO: 1.

[Claim 6]

The polypeptide according to any of claims 1 to 5, wherein at least one of amino acids D276, V223, W225, Y247, and W248 remains unchanged and preferably at least D276 remains unchanged.

[Claim 7]

The polypeptide according to any of claims 1 to 3, wherein the polypeptide is a polypeptide consisting of the amino acid sequence of SEQ ID NO: 1 or a polypeptide

consisting of an amino acid sequence having at least one mutation selected from the group consisting of A128T, D333G, I434L, V460A, I527V, K569T, F610S, and H626R in the amino acid sequence of SEQ ID NO: 1.

[Claim 8]

The polypeptide according to claim 1, wherein the polypeptide consists of an amino acid sequence of any of SEQ ID NOS: 1 to 6.

[Claim 9]

The polypeptide according to any of claims 1 to 6, wherein the polypeptide has at least one of the mutations contained in SEQ ID NO: 23.

[Claim 10]

The polypeptide according to claim 9, wherein the polypeptide has a mutation in at least one amino acid selected from N172, D176, Y214, S216, L245, N246, T275, L306, F307, and A310 and has increased transglycosylation activity.

[Claim 11]

The polypeptide according to claim 9 or 10, wherein the polypeptide has at least one mutation selected from the group of:

a mutation in which N172 is substituted with Gln, Asp, Gly, Ala, Phe, Cys, His, Ile, Ser, Thr, Val, Met, Glu, Lys, Leu, Pro, Arg, Trp, or Tyr;
a mutation in which D176 is substituted with Arg;
a mutation in which Y214 is substituted with Phe;
a mutation in which S216 is substituted with Val;
a mutation in which L245 is substituted with Ser;
a mutation in which N246 is substituted with Asp;
a mutation in which T275 is substituted with Ile;
a mutation in which F283 is substituted with Ser;
a mutation in which L306 is substituted with Ile;
a mutation in which F307 is substituted with Tyr;
a mutation in which A310 is substituted with Asp; and
a mutation in which E314 is substituted with Gln.

[Claim 12]

The polypeptide according to any of claims 9 to 11, wherein the polypeptide has a mutation in which W278 is substituted with Phe or Tyr.

[Claim 13]

A polynucleotide encoding the polypeptide according to any of claims 1 to 12.

[Claim 14]

The polynucleotide according to claim 13, having a nucleotide sequence of any of the nucleotide sequences from nucleotide positions 1 to 2088 of SEQ ID NOS: 8 to

17 and the nucleotide sequences from nucleotide positions 1 to 2091 of SEQ ID NOS: 18 to 19.

[Claim 15]

An expression plasmid comprising the polynucleotide according to claim 13 or 14.

[Claim 16]

A host cell transformed with the plasmid according to claim 15.

[Claim 17]

The host cell according to claim 16, wherein the host cell is *E. coli* transformed with a plasmid comprising a polynucleotide comprising the nucleotide sequence from nucleotide positions 1 to 2088 of SEQ ID NO: 9, 11, 13, 15, or 17 or the nucleotide sequence from nucleotide positions 1 to 2091 of SEQ ID NO: 19.

[Claim 18]

A method of producing the polypeptide according to any of claims 1 to 12, comprising culturing the host cells according to claim 16 or 17 and collecting the polypeptide according to any of claims 1 to 12 from the resulting culture.

[Claim 19]

A reagent comprising the polypeptide according to any of claims 1 to 12.