CLAIMS

1. A uridine diphosphate-dependent glycosyltransferase (UGT) enzyme comprising an amino acid sequence that is at least 85% identical to the amino acid sequence of SEQ ID NO: 5 or SEQ ID NO: 6, wherein:

the enzyme has an insertion with respect to SEQ ID NO: 1 of a flexible and hydrophilic sequence of 6 to 12 Glycine and Serine residues after the position corresponding to position 155 of SEQ ID NO: 5; and

the enzyme comprises:

a glycine (G) at the position corresponding to position 54 of SEQ ID NO: 5;

a leucine (L) at the position corresponding to position 111 of SEQ ID NO: 5; and

a methionine (M) at the position corresponding to position 183 of SEQ ID NO: 5.

2. The enzyme of claim 1, wherein the amino acid sequence is at least 95% identical to SEQ ID NO: 5 or SEQ ID NO: 6.

3. The enzyme of claim 1, wherein the insertion is GSGGSG (SEQ ID NO: 7) or GSGGSGGSG (SEQ ID NO: 8).

4. The enzyme of claim 1, wherein the enzyme comprises a deletion of at least three amino acids corresponding to amino acids E225 to T232 with respect to the amino acid sequence of SEQ ID NO: 6.

5. The enzyme of claim 4, wherein the enzyme comprises a deletion of the amino acids corresponding to amino acids E225 to T232 of SEQ ID NO: 6.

6. The enzyme of claim 1, wherein the enzyme comprises an amino acid substitution at one or more positions corresponding to position 72, position 305, position 345, and position 428 of SEQ ID NO: 6.

7. The enzyme of claim 6, wherein the enzyme comprises one or more amino acid substitutions selected from: a glutamine (Q) at the position corresponding to position 72 of SEQ ID NO: 6; a cysteine (C) at the position corresponding to position 305 of SEQ ID NO: 6; a

phenylalanine (F) at the position corresponding to position 345 of SEQ ID NO: 6; and an isoleucine (I) at the position corresponding to position 428 of SEQ ID NO: 6.

8. The enzyme of claim 1, comprising an amino acid sequence of SEQ ID NO: 9.

9. A polynucleotide encoding the enzyme of any one of claim 1.

10. A recombinant microorganism comprising the polynucleotide of claim 9.

11. A method for transferring a monosaccharide group to a substrate comprising contacting a NDP-sugar and the substrate with the recombinant microorganism of claim 10.

12. A method for transferring a glycosyl group to a substrate comprising growing the recombinant microorganism of claim 10 in the presence of the substrate.