WHAT IS CLAIMED IS:

1. A recombinant host comprising:

    a) a recombinant gene encoding a UGT91D2 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:5; and one or more of:

    (b) a recombinant gene encoding a UGT85C polypeptide, comprising a UGT85C polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:3; and/or

    (c) a recombinant gene encoding a UGT76G1 polypeptide, comprising a UGT76G1 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:7; and/or

    (d) a recombinant gene encoding a UGT74G1 polypeptide, comprising a UGT74G1 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:1;

    wherein at least one of said genes is a recombinant gene;

    wherein the recombinant host produces steviol or a steviol glycoside.

2. The recombinant host of claim 1, wherein the UGT85C polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:3 comprises one or more amino acid substitutions at residues 9, 10, 13, 15, 21, 27, 60, 65, 71, 87, 91, 220, 243, 270, 289, 298, 334, 336, 350, 368, 389, 394, 397, 418, 420, 440, 441, 444, and 471 of SEQ ID NO:3.

3. The recombinant host of claim 1 or claim 2, wherein the UGT76G1 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:7 comprises one or more amino acid substitutions at residues 29, 74, 87, 91, 116, 123, 125, 126, 130, 145, 192, 193, 194, 196, 198, 199, 200, 203, 204, 205, 206, 207, 208, 266, 273, 274, 284, 285, 291, 330, 331, and 346 of SEQ ID NO:7.

4. The recombinant host of any one of claims 1 to 3, wherein said UGT91D2 polypeptide has at least 95% or 99% sequence identity to the amino acid sequence set forth in SEQ ID NO:5.

5. The recombinant host of any one of claims 1 to 4, wherein said UGT91D2 polypeptide comprises:

(a) at least one amino acid substitution at residues 1-19, 27-38, 44-87, 96-120, 125-141, 159-184, 199-202, 215-380, or 387-473 of SEQ ID NO:5;

(b) an amino acid substitution at one or more residues selected from the group consisting of residues 30, 93, 99, 122, 140, 142, 144, 148, 152, 153, 156, 195, 196, 199, 206, 207, 211, 213, 221, 286, 343, 364, 384, 427, and 438 of SEQ ID NO:5;

(c) an arginine at residue 206, a cysteine at residue 207, and an arginine at residue 343 of SEQ ID NO:5;

(d) a phenylalanine at residue 30, a glutamine at residue 93, a valine at residue 99, a phenylalanine at residue 122, a tyrosine at residue 140, a cysteine at residue 142, a threonine at residue 148, an alanine at residue 153, a serine at residue 156, a methionine at residue 195, a glutamic acid at residue 196, a glutamic acid at residue 199, a methionine at residue 211, a phenylalanine at residue 221, an alanine at residue 286, an asparagine at residue 427, or an alanine at residue 438 of SEQ ID NO:5;

(e) the amino acid sequence of SEQ ID NO:95;

(f) the amino acid sequence of SEQ ID NO:5; or

(g) a UGT91D2e or a UGT91D2m polypeptide.

6. The recombinant host of any one of claims 1 to 5, said host further comprising one or more of the following:

(a) a gene encoding a geranylgeranyl diphosphate synthase;

(b) a gene encoding a bifunctional copalyl diphosphate synthase and kaurene synthase, or a gene encoding a copalyl diphosphate synthase and a gene encoding a kaurene synthase;

(c) a gene encoding a kaurene oxidase;

(d) a gene encoding a steviol synthetase;

(e) a gene encoding a truncated HMG-CoA;

(f) a gene encoding a CPR;

(g) a gene encoding a rhamnose synthetase;

(h) a gene encoding a UDP-glucose dehydrogenase; and

(i) a gene encoding a UDP-glucuronic acid decarboxylase.

7. The recombinant host of claim 6, wherein at least one of the genes of (a), (b), (c), (d), (e), (f), (g), (h) or (i) is a recombinant gene.

8. The recombinant host of claim 7, wherein each of the genes of (a), (b), (c) and (d) is a recombinant gene.

9. The recombinant host of any one of claims 1 to 8, wherein the host is a microorganism, comprising a Saccharomycete such as *Saccharomyces cerevisiae*, *Escherichia coli*, or a plant or plant cell, comprising a *Stevia* such as a *Stevia rebaudiana*, *Physcomitrella patens*, or tobacco plant.

10. The recombinant host according to any one of claims 1 to 9, the host further comprising:

(a) a gene encoding a bifunctional copalyl diphosphate synthase and kaurene synthase, or a gene encoding a copalyl diphosphate synthase and a gene encoding a kaurene synthase;

(b) a gene encoding a kaurene oxidase;

(c) a gene encoding a steviol synthetase; or

(d) a gene encoding a geranylgeranyl diphosphate synthase,

wherein at least one of said genes is a recombinant gene;

wherein the host produces at least one steviol glycoside such as rebaudioside A, rebaudioside D or rebaudioside E when cultured under conditions in which said genes are expressed,

wherein the host further comprises a gene encoding a rhamnose synthetase and produces at least one steviol glycoside such as rebaudioside C or dulcoside A when cultured under conditions in which said genes are expressed; or

wherein the host further comprises a gene encoding a UDP-glucose dehydrogenase and a gene encoding a UDP-glucuronic acid decarboxylase and produces at least one steviol glycoside such as rebaudioside F when cultured under conditions in which said genes are expressed.

11. The recombinant host according to any one of claims 1 to 10, further comprising exogenous nucleic acids including:

(a) a recombinant gene encoding a geranylgeranyl diphosphate synthase (GGPPS) polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:121-128;

(b) a recombinant gene encoding an copalyl diphosphate synthase (CDPS) polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:129-131;

(c) a recombinant gene encoding a kaurene synthase (KS) polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:132-135;

(d) a recombinant gene encoding a kaurene oxidase (KO) polypeptide, comprising KO polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:138-141;

(e) a recombinant gene encoding a steviol synthase polypeptide (KAH), comprising a steviol synthase polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:142-146;

(f) a recombinant gene encoding a cytochrome P450 reductase (CPR) polypeptide, comprising a CPR polypeptide having at least 90% sequence identity to any one of the amino acid sequence set forth in SEQ ID NOs: 147-149;

wherein the recombinant host produces steviol or the steviol glycoside.

12. The recombinant host of any one of claims 1 to 11, wherein the steviol or the steviol glycoside comprises steviol-13-O-glucoside, steviol-19-O-glucoside, rubusoside, rebaudioside A, rebaudioside B, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F, and dulcoside A.

13. The recombinant host of any one of claims 1 to 12 for the production of a steviol or a steviol glycoside, wherein one or more of the genes encoding a polypeptide comprises exogenous nucleic acids.

14. A steviol glycoside composition produced by the recombinant host of any one of claims 1-13, the composition comprising:

(a) greater than 4% rebaudioside D by weight total steviol glycosides and a reduced level of non-steviol glycoside Stevia plant-derived components relative to a wild type plant-derived stevia extract;

(b) greater than 4% rebaudioside E by weight total steviol glycosides and the reduced level of non-steviol glycoside Stevia plant-derived components relative to the wild type plant-derived stevia extract;

(c) greater than 15% rebaudioside C by weight total steviol glycosides and the reduced level of non-steviol glycoside Stevia plant-derived components relative to the wild type plant-derived stevia extract;

(d) greater than 15% dulcoside A by weight total steviol glycosides and the reduced level of non-steviol glycoside Stevia plant-derived components relative to the wild type plant-derived stevia extract;

(e) greater than 4% rebaudioside F by weight total steviol glycosides and the reduced level of non-steviol glycoside Stevia plant-derived components relative to the wild type plant-derived stevia extract; or

(f) greater than 3% rebaudioside B by weight total steviol glycosides and the reduced level of non-steviol glycoside Stevia plant-derived components relative to the wild type plant-derived stevia extract.

15. A method of synthesizing a steviol, steviol glycoside or steviol glycoside composition, wherein the reduced level of non-steviol glycoside Stevia plant-derived components relative to the wild type plant-derived stevia extract is present, comprising:

(a) growing the recombinant host of any one of claims 1-13 in a culture medium, under conditions in which one or more of the genes are expressed,

wherein growing can include inducing expression of one or more of the genes, such that steviol, steviol glycoside or steviol glycoside composition is synthesized by the recombinant host; and

(b) recovering steviol, steviol glycoside or steviol glycoside composition.

16. The method according to claim 15, comprising:

(a) growing the host of any one of claims 1-13 in a culture medium, under conditions in which the genes are expressed, wherein growing can include inducing expression of one or more of the genes; and

(b) (i) recovering the steviol or the steviol glycoside produced by said host, wherein the steviol glycoside comprises steviol-13-O-glucoside, steviol-19-O-glucoside, rubusoside, rebaudioside A, rebaudioside B, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F, or dulcoside A; or

(b) (ii) recovering the steviol glycoside composition produced by the host, wherein the composition is enriched for rebaudioside A, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F or dulcoside A relative to the steviol glycoside composition of a wild-type Stevia plant and has the reduced level of non-steviol glycoside Stevia plant-derived components relative to the wild type plant-derived stevia extract.

17. The method of claim 15 or claim 16, wherein the recombinant host is grown in a fermentor at a defined temperature for a desired period of time.

18. The method of any one of claims 15 to 17, wherein the steviol or steviol glycoside comprises steviol-13-O-glucoside, steviol-19-O-glucoside, rubusoside, rebaudioside A, rebaudioside B, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F, and dulcoside A.

WHAT IS CLAIMED IS:

1. A recombinant host comprising:
    a) a recombinant gene encoding a UGT91D2 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:5; and one or more of:
    (b) a recombinant gene encoding a UGT85C polypeptide, comprising a UGT85C polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:3; and/or
    (c) a recombinant gene encoding a UGT76G1 polypeptide, comprising a UGT76G1 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:7; and/or
    (d) a recombinant gene encoding a UGT74G1 polypeptide, comprising a UGT74G1 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:1.

2. The recombinant host of claim 1, wherein the UGT85C polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:3 comprises one or more amino acid substitutions at residues 9, 10, 13, 15, 21, 27, 60, 65, 71, 87, 91, 220, 243, 270, 289, 298, 334, 336, 350, 368, 389, 394, 397, 418, 420, 440, 441, 444, and 471 of SEQ ID NO:3.

3. The recombinant host of claim 1 or claim 2, wherein the UGT76G1 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:7 comprises one or more amino acid substitutions at residues 29, 74, 87, 91, 116, 123, 125, 126, 130, 145, 192, 193, 194, 196, 198, 199, 200, 203, 204, 205, 206, 207, 208, 266, 273, 274, 284, 285, 291, 330, 331, and 346 of SEQ ID NO:7.

4. The recombinant host of any one of claims 1 to 3, wherein said UGT91D2 polypeptide has at least 95% or 99% sequence identity to the amino acid sequence set forth in SEQ ID NO:5.

5. The recombinant host of any one of claims 1 to 4, wherein said UGT91D2 polypeptide comprises:

(a) at least one amino acid substitution at residues 1-19, 27-38, 44-87, 96-120, 125-141, 159-184, 199-202, 215-380, or 387-473 of SEQ ID NO:5;

(b) an amino acid substitution at one or more residues selected from the group consisting of residues 30, 93, 99, 122, 140, 142, 144, 148, 152, 153, 156, 195, 196, 199, 206, 207, 211, 213, 221, 286, 343, 364, 384, 427, and 438 of SEQ ID NO:5;

(c) an arginine at residue 206, a cysteine at residue 207, and an arginine at residue 343 of SEQ ID NO:5;

(d) a phenylalanine at residue 30, a glutamine at residue 93, a valine at residue 99, a phenylalanine at residue 122, a tyrosine at residue 140, a cysteine at residue 142, a threonine at residue 148, an alanine at residue 153, a serine at residue 156, a methionine at residue 195, a glutamic acid at residue 196, a glutamic acid at residue 199, a methionine at residue 211, a phenylalanine at residue 221, an alanine at residue 286, an asparagine at residue 427, or an alanine at residue 438 of SEQ ID NO:5;

(e) the amino acid sequence of SEQ ID NO:95;

(f) the amino acid sequence of SEQ ID NO:5; or

(g) a UGT91D2e or a UGT91D2m polypeptide.

6. The recombinant host of any one of claims 1 to 5, said host further comprising one or more of the following:

(a) a gene encoding a geranylgeranyl diphosphate synthase;

(b) a gene encoding a bifunctional copalyl diphosphate synthase and kaurene synthase, or a gene encoding a copalyl diphosphate synthase and a gene encoding a kaurene synthase;

(c) a gene encoding a kaurene oxidase;

(d) a gene encoding a steviol synthetase;

(e) a gene encoding a truncated HMG-CoA;

(f) a gene encoding a CPR;

(g) a gene encoding a rhamnose synthetase;

(h) a gene encoding a UDP-glucose dehydrogenase; and

(i) a gene encoding a UDP-glucuronic acid decarboxylase.

7. The recombinant host of claim 6, wherein at least one of the genes of (a), (b), (c), (d), (e), (f), (g), (h) or (i) is a recombinant gene.

8. The recombinant host of claim 7, wherein each of the genes of (a), (b), (c) and (d) is a recombinant gene.

9. The recombinant host of any one of claims 1 to 8, wherein the host is a microorganism, comprising a Saccharomycete such as *Saccharomyces cerevisiae*, *Escherichia coli*, or a plant or plant cell, comprising a *Stevia* such as a *Stevia rebaudiana*, *Physcomitrella patens*, or tobacco plant.

10. The recombinant host according to any one of claims 1 to 9, the host further comprising:

(a) a gene encoding a bifunctional copalyl diphosphate synthase and kaurene synthase, or a gene encoding a copalyl diphosphate synthase and a gene encoding a kaurene synthase;

(b) a gene encoding a kaurene oxidase;

(c) a gene encoding a steviol synthetase; or

(d) a gene encoding a geranylgeranyl diphosphate synthase,

wherein at least one of said genes is a recombinant gene;

wherein the host produces at least one steviol glycoside such as rebaudioside A, rebaudioside D or rebaudioside E when cultured under conditions in which said genes are expressed,

wherein the host further comprises a gene encoding a rhamnose synthetase and produces at least one steviol glycoside such as rebaudioside C or dulcoside A when cultured under conditions in which said genes are expressed; or

wherein the host further comprises a gene encoding a UDP-glucose dehydrogenase and a gene encoding a UDP-glucuronic acid decarboxylase and produces at least one steviol glycoside such as rebaudioside F when cultured under conditions in which said genes are expressed.

11. The recombinant host according to any one of claims 1 to 10, further comprising exogenous nucleic acids including:

(a) a recombinant gene encoding a geranylgeranyl diphosphate synthase (GGPPS) polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:121-128;

(b) a recombinant gene encoding an copalyl diphosphate synthase (CDPS) polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:129-131;

(c) a recombinant gene encoding a kaurene synthase (KS) polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:132-135;

(d) a recombinant gene encoding a kaurene oxidase (KO) polypeptide, comprising KO polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:138-141;

(e) a recombinant gene encoding a steviol synthase polypeptide (KAH), comprising a steviol synthase polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:142-146;

(f) a recombinant gene encoding a cytochrome P450 reductase (CPR) polypeptide, comprising a CPR polypeptide having at least 90% sequence identity to any one of the amino acid sequence set forth in SEQ ID NOs: 147-149;

wherein the recombinant host produces a steviol or a steviol glycoside.

12. The recombinant host of any one of claims 1 to 10, wherein the steviol or the steviol glycoside comprises steviol-13-O-glucoside, steviol-19-O-glucoside, rubusoside, rebaudioside A, rebaudioside B, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F, and dulcoside A.

13. The recombinant host of any one of claims 1 to 12 for the production of a steviol or a steviol glycoside, wherein one or more of the genes encoding a polypeptide comprises exogenous nucleic acids.

14. An isolated nucleic acid:

(a) encoding a polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:5, comprising:

(i) a polypeptide comprising an amino acid substitution at one or more residues selected from the group consisting of residues 30, 93, 99, 122, 140, 142, 144, 148, 153, 156, 195, 196, 199, 206, 207, 211, 221, 286, 343, 427, and 438 of SEQ ID NO:5; or

(i) a polypeptide comprising an arginine at residue 206, a cysteine at residue 207, and an arginine at residue 343 of SEQ ID NO:5; or

(iii) a polypeptide comprising a phenylalanine at residue 30, a glutamine at residue 93, a valine at residue 99, a phenylalanine at residue 122, a tyrosine at residue 140, a cysteine at residue 142, a threonine at residue 148, an alanine at residue 153, a serine at residue 156, a methionine at residue 195, a glutamic acid at residue 196, a glutamic acid at residue 199, a methionine at residue 211, a phenylalanine at residue 221, an alanine at residue 286, an asparagine at residue 427, or an alanine at residue 438 of SEQ ID NO:5; or

(iv) a polypeptide having at least 90% sequence identity to the amino acid sequence of UGT91D2m of SEQ ID NO:10, excluding the amino acid sequence of UGT91D2m of SEQ ID NO:10.

15. An isolated polypeptide having an amino acid sequence having at least 90% sequence identity to the amino acid sequence of SEQ ID NO:5; or an isolated polypeptide having at least 90% sequence identity to the amino acid sequence of UGT91D2m of SEQ ID NO:10, excluding the amino acid sequence of UGT91Dm of SEQ ID NO:10.

16. A steviol glycoside composition produced by the recombinant host of any one of claims 1-13, said composition comprising:

(a) greater than 4% rebaudioside D by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract;

(b) greater than 4% rebaudioside E by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract;

(c) greater than 15% rebaudioside C by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract;

(d) greater than 15% dulcoside A by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract;

(e) greater than 4% rebaudioside F by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract; or

(f) greater than 3% rebaudioside B by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract.

17. A method for transferring a second sugar moiety to the C-2' of a glucose in a steviol glycoside, said method comprising contacting said steviol glycoside with a 13-monoglucoside beta 1,2-glycosyltransferase or a 19-monoglucoside-beta 1,2-glucosyltransferase and a UDP-sugar under suitable reaction conditions for the transfer of said second sugar moiety to said steviol glycoside, wherein the steviol glycoside optionally can be selected from the group consisting of steviol-13-O-glucoside, rubusoside, stevioside, and rebaudioside A.

18. The method of claim 17, wherein the method is an *in vitro* method, further comprising supplying the UDP-sugar or a cell-free system for regeneration of UDP-sugar.

19. The method of claim 17 or claim 18, wherein said beta 1,2-glycosyltransferase is a UGT91D2 polypeptide, said UGT91D2 polypeptide optionally having at least 90%, 95%, or 99% sequence identity to the amino acid sequence set forth in SEQ ID NO:5, wherein the UGT91D2 polypeptide comprises:

(a) at least one amino acid substitution at residues 1-19, 27-38, 44-87, 96-120, 125-141, 159-184, 199-202, 215-380, or 387-473 of SEQ ID NO:5;

(b) an amino acid substitution at one or more residues selected from the group consisting of residues 30, 93, 99, 122, 140, 142, 144, 148, 152, 153, 156, 195, 196, 199, 206, 207, 211, 213, 221, 286, 343, 364, 384, 427, and 438 of SEQ ID NO:5;

(c) an arginine at residue 206, a cysteine at residue 207, and an arginine at residue 343 relative to SEQ ID NO:5;

(d) a tyrosine or phenylalanine at residue 30, a proline or glutamine at residue 93, a serine or valine at residue 99, a tyrosine or phenylalanine at residue 122, a histidine or tyrosine at residue 140, a serine or cysteine at residue 142, an alanine or threonine at residue 148, a methionine at residue 152, an alanine at residue 153, an alanine or serine at residue 156, a glycine at residue 162, a leucine or methionine at residue 195, a glutamic acid at residue 196, a lysine or glutamic acid at residue 199, a leucine or methionine at residue 211, a leucine at residue 213, a serine or phenylalanine at residue 221, a valine or isoleucine at residue 253, a valine or alanine at residue 286, an asparagine or lysine at residue 427, or an alanine at residue 438 and an alanine or threonine at residue 462 relative to SEQ ID NO:5;

(e) the amino acid sequence of SEQ ID NO:95;

(f) the amino acid sequence of SEQ ID NO:5; or

(g) a UGT91D2e or a UGT91D2m polypeptide.

20. The method of any one of claims 17 to 19, wherein the beta 1,2-glycosyltransferase is a UGT79B3 polypeptide having amino acid sequence set forth in SEQ ID NO:150 or a SM12UGT polypeptide such as an IP3GGT polypeptide having amino acid sequence set forth in SEQ ID NO:76 or a UGT94B1 polypeptide having amino acid sequence set forth in SEQ ID NO:78.

21. The method of any one of claims 17 or 18, wherein

(a) said steviol glycoside is rubusoside, said second sugar moiety is glucose, and stevioside is produced upon transfer of said second glucose moiety;

(b) said steviol glycoside is stevioside, said second sugar moiety is glucose, and Rebaudioside E is produced upon transfer of said second glucose moiety;

(c) said steviol glycoside is stevioside, said second sugar moiety is glucose, said stevioside is contacted with said 19-monoglucoside-beta 1,2-glucosyltransferase and a UGT76G1 polypeptide, and Rebaudioside D is produced upon transfer of said second glucose moiety;

(d) said steviol glycoside is steviol-13-O-glucoside, said second sugar moiety is glucose, and steviol-1,2 bioside is produced upon transfer of said second glucose moiety;

(e) said steviol glycoside is steviol-13-O-glucoside, said second sugar moiety is xylose, and steviol-1,2-xylobioside is produced upon transfer of said second sugar moiety;

(f) said steviol glycoside is steviol-13-O-glucoside, said second sugar moiety is rhamnose, and steviol-1,2-rhamnobioside is produced upon transfer of said second sugar moiety; or

(g) said steviol glycoside is rebaudioside A, said second sugar moiety is glucose, and rebaudioside D is produced upon transfer of said second glucose moiety.

22. A method of synthesizing a steviol, steviol glycoside or steviol glycoside composition, wherein a reduced level of Stevia-derived contaminants relative to a plant-derived stevia extract is present, comprising:

(a) growing the recombinant host of any one of claims 1-13 in a culture medium, under conditions in which one or more of said genes are expressed,

wherein growing can include inducing expression of one or more of said genes, such that a compound comprising the steviol or steviol glycoside of interest is synthesized by said host; and

(b) recovering one or more of said compound.

23. The method according to claim 22, comprising:

(a) growing the host of any one of claims 1-13 in a culture medium, under conditions in which said genes are expressed, wherein growing can include inducing expression of one or more of said genes; and

(b) (i) recovering the steviol or the steviol glycoside produced by said host, wherein the steviol glycoside comprises steviol-13-O-glucoside, steviol-19-O-glucoside, rubusoside, rebaudioside A, rebaudioside B, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F, or dulcoside A; or

(b) (ii) recovering the steviol glycoside composition produced by said host, wherein said composition is enriched for rebaudioside A, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F or dulcoside A relative to the steviol glycoside composition of a wild-type Stevia plant and has a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract.

24. The method of claim 22 or claim 23, wherein the recombinant host is grown in a fermentor at a defined temperature for a desired period of time.

25. The method of any one of claims 22 to 24, wherein the steviol or steviol glycoside comprises steviol-13-O-glucoside, steviol-19-O-glucoside, rubusoside, rebaudioside A, rebaudioside B, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F, and dulcoside A.

26. A recombinant host comprising:

(a) a gene encoding a UGT91D2 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:5; and one or more of:

(b) a gene encoding a UGT85C polypeptide, comprising a UGT85C polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:3; and/or

(c) a gene encoding a UGT76G1 polypeptide, comprising a UGT76G1 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:7; and/or

(d) a gene encoding a UGT74G1 polypeptide, comprising a UGT74G1 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:1;

wherein at least one of said genes is a recombinant gene; and,

wherein the recombinant host produces a steviol or steviol glycoside.

27. The recombinant host of claim 26, wherein the UGT85C polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:3 comprises one or more amino acid substitutions at residues 9, 10, 13, 15, 21, 27, 60, 65, 71, 87, 91,

220, 243, 270, 289, 298, 334, 336, 350, 368, 389, 394, 397, 418, 420, 440, 441, 444, and 471 of SEQ ID NO:3.

28. The recombinant host of claim 26 or claim 27, wherein the UGT76G1 polypeptide having at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO:7 comprises one or more amino acid substitutions at residues 29, 74, 87, 91, 116, 123, 125, 126, 130, 145, 192, 193, 194, 196, 198, 199, 200, 203, 204, 205, 206, 207, 208, 266, 273, 274, 284, 285, 291, 330, 331, and 346 of SEQ ID NO:7.

29. The recombinant host of any one of claims 26 to 28, wherein said UGT91D2 polypeptide has at least 95% or 99% sequence identity to the amino acid sequence set forth in SEQ ID NO:5.

30. The recombinant host of any one of claims 26 to 29, wherein said UGT91D2 polypeptide comprises:

(a) at least one amino acid substitution at residues 1-19, 27-38, 44-87, 96-120, 125-141, 159-184, 199-202, 215-380, or 387-473 of SEQ ID NO:5;

(b) an amino acid substitution at one or more residues selected from the group consisting of residues 30, 93, 99, 122, 140, 142, 144, 148, 152, 153, 156, 195, 196, 199, 206, 207, 211, 213, 221, 286, 343, 364, 384, 427, and 438 of SEQ ID NO:5;

(c) an arginine at residue 206, a cysteine at residue 207, and an arginine at residue 343 of SEQ ID NO:5;

(d) a phenylalanine at residue 30, a glutamine at residue 93, a valine at residue 99, a phenylalanine at residue 122, a tyrosine at residue 140, a cysteine at residue 142, a threonine at residue 148, an alanine at residue 153, a serine at residue 156, a methionine at residue 195, a glutamic acid at residue 196, a glutamic acid at residue 199, a methionine at residue 211, a phenylalanine at residue 221, an alanine at residue 286, an asparagine at residue 427, or an alanine at residue 438 of SEQ ID NO:5;

(e) the amino acid sequence of SEQ ID NO:95;

(f) the amino acid sequence of SEQ ID NO:5; or

(g) a UGT91D2e or a UGT91D2m polypeptide.

31. The recombinant host of any one of claims 26 to 30, said host further comprising one or more of the following:

(a) a gene encoding a geranylgeranyl diphosphate synthase;

(b) a gene encoding a bifunctional copalyl diphosphate synthase and kaurene synthase, or a gene encoding a copalyl diphosphate synthase and a gene encoding a kaurene synthase;

(c) a gene encoding a kaurene oxidase;

(d) a gene encoding a steviol synthetase;

(e) a gene encoding a truncated HMG-CoA;

(f) a gene encoding a CPR;

(g) a gene encoding a rhamnose synthetase;

(h) a gene encoding a UDP-glucose dehydrogenase; and

(i) a gene encoding a UDP-glucuronic acid decarboxylase.

32. The recombinant host of claim 31, wherein at least one of the genes of (a), (b), (c), (d), (e), (f), (g), (h) or (i) is a recombinant gene.

33. The recombinant host of claim 32, wherein each of the genes of (a), (b), (c) and (d) is a recombinant gene.

34. The recombinant host of any one of claims 26 to 33, wherein the host is a microorganism, comprising a Saccharomycete such as *Saccharomyces cerevisiae*, *Escherichia coli*, or a plant or plant cell, comprising a *Stevia* such as a *Stevia rebaudiana*, *Physcomitrella patens*, or tobacco plant.

35. The recombinant host according to any one of claims 26 to 34, the host further comprising:

(a) a gene encoding a bifunctional copalyl diphosphate synthase and kaurene synthase, or a gene encoding a copalyl diphosphate synthase and a gene encoding a kaurene synthase;

(b) a gene encoding a kaurene oxidase;

(c) a gene encoding a steviol synthetase; or

(d) a gene encoding a geranylgeranyl diphosphate synthase,

wherein at least one of said genes is a recombinant gene;

wherein the host produces at least one steviol glycoside such as rebaudioside A, rebaudioside D or rebaudioside E when cultured under conditions in which said genes are expressed,

wherein the host further comprises a gene encoding a rhamnose synthetase and produces at least one steviol glycoside such as rebaudioside C or dulcoside A when cultured under conditions in which said genes are expressed; or

wherein the host further comprises a gene encoding a UDP-glucose dehydrogenase and a gene encoding a UDP-glucuronic acid decarboxylase and produces at least one steviol glycoside such as rebaudioside F when cultured under conditions in which said genes are expressed.

36. The recombinant host according to any one of claims 26 to 35, further comprising exogenous nucleic acids including:

(a) a recombinant gene encoding a geranylgeranyl diphosphate synthase (GGPPS) polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:121-128;

(b) a recombinant gene encoding an copalyl diphosphate synthase (CDPS) polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:129-131;

(c) a recombinant gene encoding a kaurene synthase (KS) polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:132-135;

(d) a recombinant gene encoding a kaurene oxidase (KO) polypeptide, comprising KO polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:138-141;

(e) a recombinant gene encoding a steviol synthase polypeptide (KAH), comprising a steviol synthase polypeptide having at least 90% sequence identity to any one of the amino acid sequences set forth in SEQ ID NOs:142-146;

(f) a recombinant gene encoding a cytochrome P450 reductase (CPR) polypeptide, comprising a CPR polypeptide having at least 90% sequence identity to any one of the amino acid sequence set forth in SEQ ID NOs: 147-149;

wherein the recombinant host produces a steviol or a steviol glycoside.

37. The recombinant host of any one of claims 26 to 35, wherein the steviol or the steviol glycoside comprises steviol-13-O-glucoside, steviol-19-O-glucoside, rubusoside, rebaudioside A, rebaudioside B, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F, and dulcoside A.

38. The recombinant host of any one of claims 26 to 37 for the production of a steviol or a steviol glycoside, wherein one or more of the genes encoding a polypeptide comprises exogenous nucleic acids.

39. A steviol glycoside composition produced by the recombinant host of any one of claims 26-38, said composition comprising:

(a) greater than 4% rebaudioside D by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract;

(b) greater than 4% rebaudioside E by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract;

(c) greater than 15% rebaudioside C by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract;

(d) greater than 15% dulcoside A by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract;

(e) greater than 4% rebaudioside F by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract; or

(f) greater than 3% rebaudioside B by weight total steviol glycosides and a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract.

40. A method of synthesizing a steviol, steviol glycoside or steviol glycoside composition, wherein a reduced level of Stevia-derived contaminants relative to a plant-derived stevia extract is present, comprising:

(a) growing the recombinant host of any one of claims 26-38 in a culture medium, under conditions in which one or more of said genes are expressed,

wherein growing can include inducing expression of one or more of said genes, such that a compound comprising the steviol or steviol glycoside of interest is synthesized by said host; and

(b) recovering one or more of said compound.

41. The method according to claim 40, comprising:

(a) growing the host of any one of claims 26-38 in a culture medium, under conditions in which said genes are expressed, wherein growing can include inducing expression of one or more of said genes; and

(b) (i) recovering the steviol or the steviol glycoside produced by said host, wherein the steviol glycoside comprises steviol-13-O-glucoside, steviol-19-O-glucoside, rubusoside, rebaudioside A, rebaudioside B, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F, or dulcoside A; or

(b) (ii) recovering the steviol glycoside composition produced by said host, wherein said composition is enriched for rebaudioside A, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F or dulcoside A relative to the steviol glycoside composition of a wild-type Stevia plant and has a reduced level of stevia plant-derived contaminants relative to a plant-derived stevia extract.

42. The method of claim 40 or claim 41, wherein the recombinant host is grown in a fermentor at a defined temperature for a desired period of time.

43. The method of any one of claims 40 to 42, wherein the steviol or steviol glycoside comprises steviol-13-O-glucoside, steviol-19-O-glucoside, rubusoside, rebaudioside A, rebaudioside B, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F, and dulcoside A.