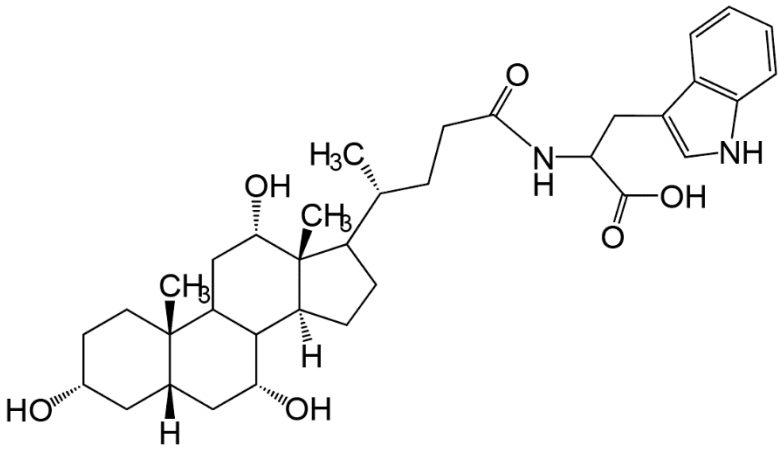
CLAIMS

1. Non-therapeutic use of a tryptophan-conjugated cholic acid (TrpCA) or a strain producing the same or a food composition comprising the tryptophan-conjugated cholic acid or the strain producing the same in promoting GLP-1 and/or insulin secretion, and/or in maintaining healthy blood glucose level, maintaining healthy blood lipid and/or regulating body fat; wherein the tryptophan-conjugated cholic acid has the following structure:



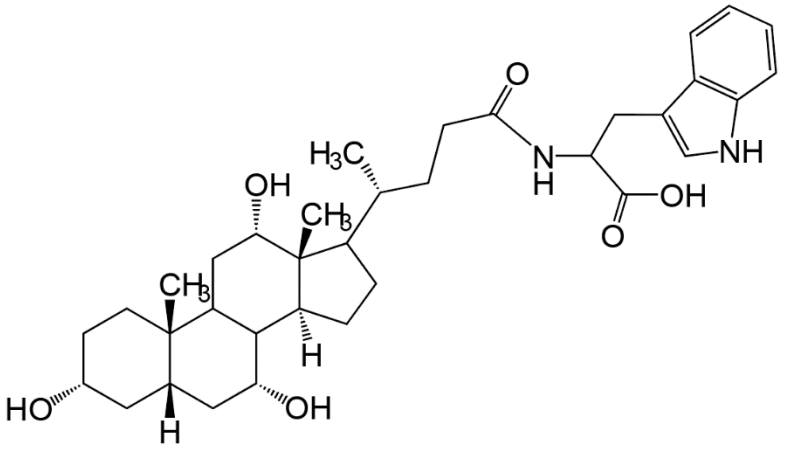
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2. The non-therapeutic use of claim 1, wherein the strain belongs to one or more of the following genera: *Streptococcus*, *Pediococcus*, *Lactobacillus*, *Limosilactobacillus*, *Lactilactobacillus*, *Ligilactobacillus*, *Lactiplantibacillus*, *Bifidobacterium*, and *Lactococcus.*

3. The non-therapeutic use of claim 1, wherein the strain belongs to one or more of the following species: *Streptococcus salivarius*, *Pediococcus acidilactici*, *Lactobacillus gasseri*, *Limosilactobacillus reuteri*, *Lactilactobacillus sakei, Lactobacillus acidophilus*, *Ligilactobacillus salivarius*, *Lactiplantibacillus plantarum*, *Bifidobacterium animalis* and *Lactococcus lactis*.

4. A non-therapeutic method for promoting GLP-1 and/or insulin secretion

and/or maintaining healthy blood glucose level, maintaining healthy blood lipid and/or regulating body fat in a subject, comprising administering a tryptophan-conjugated cholic acid or a strain producing the same or a food composition comprising the tryptophan-conjugated cholic acid or the strain producing the same, to the subject, wherein the tryptophan-conjugated cholic acid has the following structure:

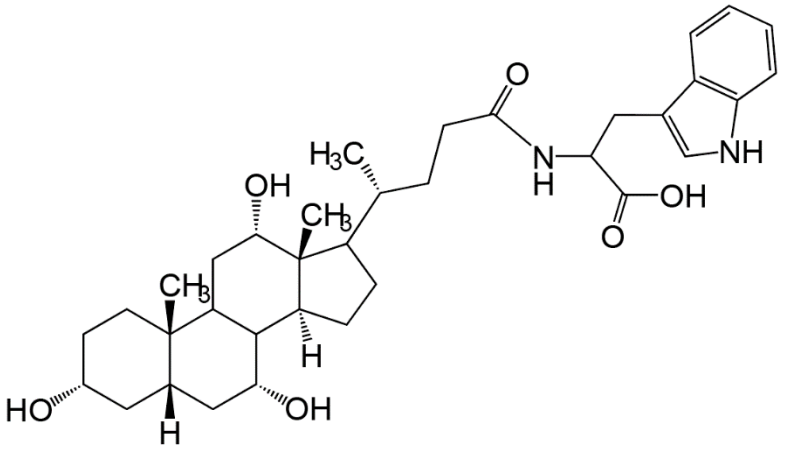


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5. The non-therapeutic method of claim 4, wherein the strain belongs to one or more of the following species: *Streptococcus salivarius*, *Pediococcus acidilactici*, *Lactobacillus gasseri*, *Limosilactobacillus reuteri*, *Lactilactobacillus sakei, Lactobacillus acidophilus*, *Ligilactobacillus salivarius*, *Lactiplantibacillus plantarum*, *Bifidobacterium animalis* and *Lactococcus lactis*.

6. Use of a tryptophan-conjugated cholic acid or a strain producing the same or a composition comprising the tryptophan-conjugated cholic acid or the strain producing the same for the manufacture of a pharmaceutical composition for preventing and/or treating a metabolic disease, wherein the metabolic disease is a GLP-1 related metabolic disease selected from diabetes or diabetes related diseases; wherein the tryptophan-conjugated cholic acid has the following

structure:



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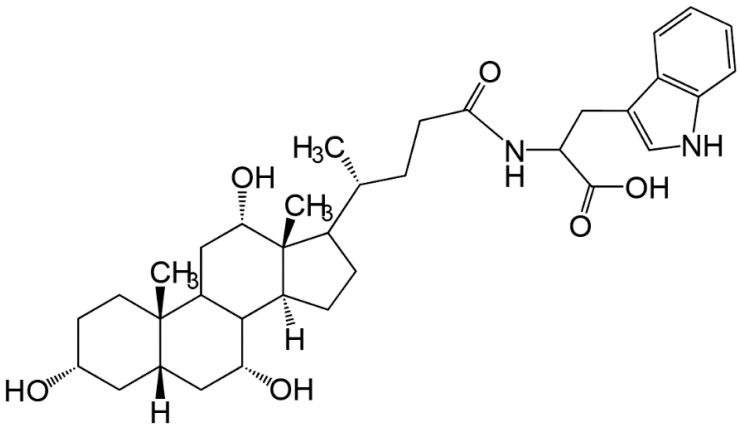
7. The use of claim 6, wherein the diabetes is selected from type 1 diabetes, type 2 diabetes, gestational diabetes, obesity diabetes, autoimmune diabetes and prediabetes; and wherein the disease associated with diabetes is selected from obesity, obesity-related disorders, metabolic syndrome, diabetic neuropathy, kidney diseases such as diabetic nephropathy, diabetic retinopathy, diabetic cardiomyopathy, cataract, macroangiopathy, osteopenia, hyperosmolar diabetic coma, diabetic gangrene, xerostomia, hypoacusis, diabetic cachexia, delayed wound healing, diabetic dyslipidemia, peripheral blood circulation disorders, non-alcoholic steatohepatitis, pre-diabetes, hyperlipemia, fatty liver disease, impaired fasting glucose, hyperglycemia, impaired glucose tolerance, insulin resistance, hyperinsulinemia, elevated blood fatty acids or glycerol levels, impaired wound healing, glucose intolerance, increased fasting glucose and dyslipidemia, insufficient numbers of pancreatic β-cells, enteroendocrine cell insufficiency, glycosuria, metabolic acidosis, cataract, diabetic coronary heart disease, diabetic cerebrovascular diseases, diabetic peripheral vascular disease, atherosclerosis and stroke; or

wherein the obesity is selected from symptomatic obesity, simple obesity, childhood obesity, morbid obesity and abdominal obesity; and

wherein the obesity related disease is selected from impaired glucose tolerance, abnormal lipid metabolism, hyperlipidemia, hypertension, heart failure, hyperuricemia, gout, fatty liver, coronary heart disease, cerebral infarction, sleep apnea syndrome, obesity hypoventilation syndrome and visceral obesity syndrome.

8. The use of claim 6 or 7, wherein the pharmaceutical composition further comprises one or more of biguanides, sulfonylureas, glinides, alpha-glucosidase inhibitors, thiazolidinediones and GLP-1 drugs.

9. A method for producing a tryptophan-conjugated cholic acid, comprising culturing a probiotic in a medium in the presence of bile acid and tryptophan, wherein the probiotic is one or more of the following genera: *Streptococcus*, *Pediococcus*, *Lactobacillus*, *Limosilactobacillus*, *Lactilactobacillus*, *Ligilactobacillus*, *Lactiplantibacillus*, *Bifidobacterium*, and *Lactococcus*; wherein the tryptophan-conjugated cholic acid has the following structure:

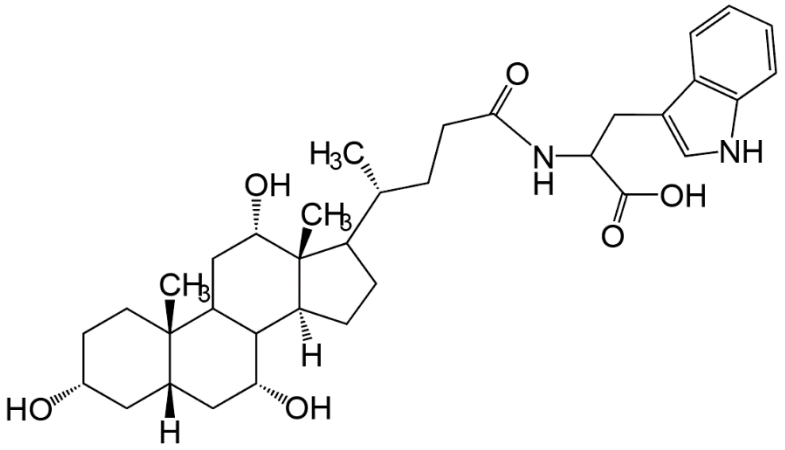


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10. The method of claim 9, wherein the probiotic belongs to one or more of the following species: *Streptococcus salivarius*, *Pediococcus acidilactici*,

Lactobacillus gasseri, *Limosilactobacillus reuteri*, *Lactilactobacillus sakei, Lactobacillus acidophilus*, *Ligilactobacillus salivarius*, *Lactiplantibacillus plantarum*, *Bifidobacterium animalis* and *Lactococcus lactis*.

11. Use of a probiotic for the production of a tryptophan-conjugated cholic acid, wherein the probiotic is one or more of the following genera: *Streptococcus*, *Pediococcus*, *Lactobacillus*, *Limosilactobacillus*, *Lactilactobacillus*, *Ligilactobacillus*, *Lactiplantibacillus*, *Bifidobacterium*, and *Lactococcus* wherein the tryptophan-conjugated cholic acid has the following structure:



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12. The use of claim 11, wherein the probiotic is one or more of the following species: *Streptococcus salivarius*, *Pediococcus acidilactici*, *Lactobacillus gasseri*, *Limosilactobacillus reuteri*, *Lactilactobacillus sakei, Lactobacillus acidophilus*, *Ligilactobacillus salivarius*, *Lactiplantibacillus plantarum*, *Bifidobacterium animalis* and *Lactococcus lactis*.

13. The use of claim 12, wherein *Streptococcus salivarius* is *Streptococcus salivarius* subsp. *thermophilus*; and *Bifidobacterium animalis* is *Bifidobacterium animalis* subsp. *lactis*.

14. A method for screening a probiotic that promote GLP-1 and/or insulin

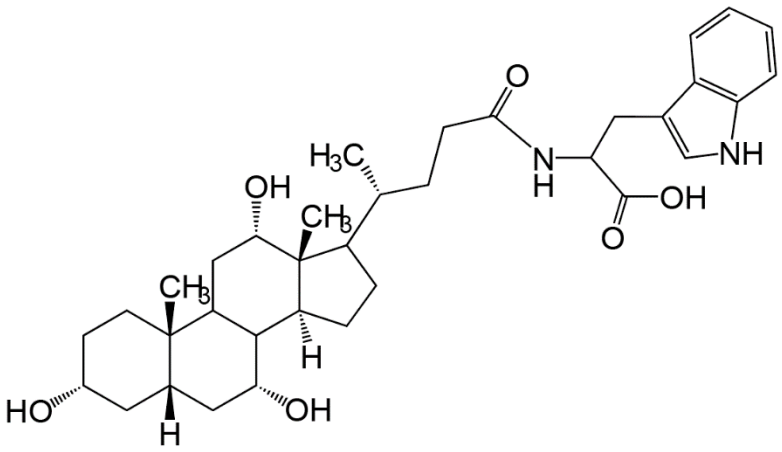
secretion or production, comprising:

(1) culturing a probiotic in the presence of bile acids and tryptophan to obtain culture supernatant;

(2) measuring the content of a tryptophan-conjugated cholic acid in the culture supernatant; and

(3) selecting the probiotic which produce the tryptophan-conjugated cholic acid;

wherein the tryptophan-conjugated cholic acid has the following structure:



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15. The method of claim 14, wherein the probiotic belongs to one or more of the following genera: *Streptococcus*, *Pediococcus*, *Lactobacillus*, *Limosilactobacillus*, *Lactilactobacillus*, *Ligilactobacillus*, *Lactiplantibacillus*, *Bifidobacterium*, and *Lactococcus*.

or, wherein the probiotic belongs to a species selected from one or more of *Streptococcus salivarius*, *Pediococcus acidilactici*, *Lactobacillus gasseri*, *Limosilactobacillus reuteri*, *Lactilactobacillus sakei, Lactobacillus acidophilus*, *Ligilactobacillus salivarius*, *Lactiplantibacillus plantarum*, *Bifidobacterium animalis* and *Lactococcus lactis*;

or, wherein *Streptococcus salivarius* is *Streptococcus salivarius* subsp. *thermophilus*; and *Bifidobacterium animalis* is *Bifidobacterium animalis* subsp. *lactis*.