replacing native genes in the upstream and/or downstream pathways with heterologous genes coding for homologous enzymes,

codon-optimization of one or more heterologous enzymes in the upstream and/or downstream pathways,

amino acid mutations in one or more genes of the upstream and/or downstream pathways, or

modifying the order of the upstream and/or downstream pathway genes in a heterologous operon.

10. The method of any one of claims 1-7, wherein the step of controlling the accumulation of indole in the cell or in a culture of the cells comprises modifying or regulating an indole pathway.

11. The method of any one of claims 1-7, wherein the step of controlling the accumulation of indole in the cell or in a culture of the cells comprises removing the accumulated indole from the cell culture through chemical methods, optionally using absorbents or scavengers.

12. The method of any one of claims 1-11, wherein the one or more terpenoids is a monoterpenoid, a sesquiterpenoid, a diterpenoid, a triterpenoid or a tetraterpenoid.

13. The method of claim 12, wherein the one or more terpenoids is a taxadiene or any taxol precursor.

14. The method of any one of claims 1-13, wherein the indole accumulates in the cell culture at less than 100 mg/L.

15. The method of any one of claims 1-14, further comprising measuring the amount or concentration of indole in the cell or in a culture of the cells.

16. The method of claim 15, wherein the method comprises measuring the amount or concentration of indole two or more times.

17. The method of claim 15 or claim 16, wherein the measured amount or concentration of indole is used to guide a process of producing one or more terpenoids and/or to guide strain construction.

Claims

1. A method for increasing terpenoid production in a cell that produces one or more terpenoids, comprising controlling the accumulation of indole in the cell or in a culture of the cells, thereby increasing terpenoid production in the cell.

2. The method of claim 1, wherein the cell overexpresses one or more components of the non-mevalonate (MEP) pathway.

3. The method of claim 2, wherein the cell recombinantly expresses a geranylgeranyl diphosphate synthase (GGPPS) enzyme.

4. The method of any one of claims 1-3, wherein the cell is a bacterial cell, a yeast cell, an algal cell, or a plant cell.

5. The method of claim 4, wherein the cell is an *E. coli* cell or a *Bacillus* cell.

6. The method of any one of claims 2-5, wherein the one or more components of the non-mevalonate (MEP) pathway is selected from *dxs*, *ispC*, *ispD*, *ispE*, *ispF*, *ispG*, *ispH*, *idi*, *ispA* and *ispB*.

7. The method of claim 6, wherein the cell comprises a heterologous dxs-idi-ispDF operon.

8. The method of any one of claims 1-7, wherein the step of controlling the accumulation of indole in the cell or in a culture of the cells comprises balancing an upstream non-mevalonate isoprenoid pathway with a downstream product synthesis pathway.

9. The method of claim 8, wherein the upstream non-mevalonate isoprenoid pathway is balanced with respect to the downstream product synthesis pathways by one or more of:

increasing gene copy number for one or more upstream or downstream pathway enzymes,

increasing or decreasing the expression level of the upstream and/or downstream pathway genes, as individual genes or as operons, using promoters with different strengths,

increasing or decreasing the expression level of the upstream and/or downstream pathway genes, as individual genes or as operons, using modifications to ribosomal binding sites,

CLAIMS

1. A method for increasing terpenoid production in a cell that produces one or more terpenoids, comprising

providing an *Escherichia coli* (*E. coli*) that produces isopentyl pyrophosphate (IPP) and dimethylallyl pyrophospate (DMAPP) through an upstream methylerythritol pathway (MEP) and converts the IPP and DMAPP to a terpenoid through a recombinantly expressed downstream terpenoid synthesis pathway; and

controlling the accumulation of indole in the *E. coli* or in a culture of the *E. coli*, thereby increasing terpenoid production in the *E. coli*, wherein the indole accumulates in the *E. coli* culture at less than 100 mg/L.

2. The method of claim 1, wherein the cell overexpresses one or more components of the MEP pathway.

3. The method of claim 2, wherein the cell recombinantly expresses a geranylgeranyl diphosphate synthase (GGPPS) enzyme.

4. The method of any one of claims 2-3, wherein the one or more components of the MEP pathway is selected from the group consisting of *dxs*, *ispC*, *ispD*, *ispE*, *ispF*, *ispG*, *ispH*, *idi*, *ispA* and *ispB*.

5. The method of claim 4, wherein the *E. coli* comprises a heterologous dxs-idi-ispDF operon.

6. The method of any one of claims 1-5, wherein the step of controlling the accumulation of indole in the *E. coli* or in a culture of the *E. coli* comprises balancing the upstream MEP pathway with the downstream terpenoid synthesis pathway.

7. The method of claim 6, wherein the upstream MEP pathway is balanced with respect to the downstream terpenoid synthesis pathways by one or more of:

increasing gene copy number for one or more upstream or downstream pathway enzymes,

increasing or decreasing the expression level of the upstream and/or downstream pathway genes, as individual genes or as operons, using promoters with different strengths,

increasing or decreasing the expression level of the upstream and/or downstream pathway genes, as individual genes or as operons, using modifications to ribosomal binding sites,

replacing native genes in the upstream and/or downstream pathways with heterologous genes coding for homologous enzymes,

codon-optimization of one or more heterologous enzymes in the upstream and/or downstream pathways,

amino acid mutations in one or more genes of the upstream and/or downstream pathways, or

modifying the order of the upstream and/or downstream pathway genes in a heterologous operon.

8. The method of any one of claims 1-5, wherein the step of controlling the accumulation of indole in the *E. coli* or in a culture of the *E. coli* comprises modifying or regulating an indole pathway.

9. The method of any one of claims 1-5, wherein the step of controlling the accumulation of indole in the *E. coli* or in a culture of the *E. coli* comprises removing the accumulated indole from the cell culture through chemical methods, optionally using absorbents or scavengers.

10. The method of any one of claims 1-9, wherein the one or more terpenoids is a monoterpenoid, a sesquiterpenoid, a diterpenoid, a triterpenoid or a tetraterpenoid.

11. The method of claim 10, wherein the one or more terpenoids is a taxadiene or any taxol precursor.

12. The method of any one of claims 1-11, further comprising measuring the amount or concentration of indole in the *E. coli* or in a culture of the *E. coli*.

13. The method of claim 12, wherein the method comprises measuring the amount or concentration of indole two or more times.

14. The method of claim 12 or claim 13, wherein the measured amount or concentration of indole is used to guide a process of producing one or more terpenoids and/or to guide strain construction.