

CLAIMS

1. A genetically engineered microorganism comprising knock-in of DNA at an acetolactate decarboxylase gene locus.
2. The microorganism of claim 1, wherein the DNA replaces the coding region of the acetolactate decarboxylase gene.
3. The microorganism of claim 1, wherein the DNA does not replace the acetolactate decarboxylase promoter.
4. The microorganism of claim 1, wherein the microorganism does not produce 2,3-butanediol.
5. The microorganism of claim 1, wherein the DNA encodes one or more enzymes.
6. The microorganism of claim 1, wherein the one or more enzymes are nonnative to the microorganism.
7. The microorganism of claim 1, wherein the one or more enzymes are native to the microorganism.
8. The microorganism of claim 1, wherein the one or more enzymes are under the control of an acetolactate decarboxylase promoter.
9. The microorganism of claim 1, wherein the DNA comprises a promoter.
10. The microorganism of claim 5, wherein the one or more enzymes are under the control of both an acetolactate decarboxylase promoter and at least one other promoter.
11. The microorganism of claim 1, wherein the one or more enzymes comprise a thiolase, a CoA transferase, and a decarboxylase selected from acetoacetate decarboxylase or alpha-ketoisovalerate decarboxylase.
12. The microorganism of claim 11, wherein the microorganism produces one or more of acetone and isopropanol.
13. The microorganism of claim 11, wherein the microorganism further comprises a disruptive mutation in a primary-secondary alcohol dehydrogenase gene.

14. The microorganism of claim 5, wherein the one or more enzymes enable production of 1-butanol, butyrate, butene, butadiene, methyl ethyl ketone, ethylene, acetone, isopropanol, lipids, 3-hydroxypropionate, terpenes, isoprene, fatty acids, 2-butanol, 1,2-propanediol, 1-propanol, 1-hexanol, 1-octanol, chorismate-derived products, 3-hydroxybutyrate, 5 1,3-butanediol, 2-hydroxyisobutyrate or 2-hydroxyisobutyric acid, isobutylene, adipic acid, 1,3-hexanediol, 3-methyl-2-butanol, 2-buten-1-ol, isovalerate, isoamyl alcohol, or monoethylene glycol.
15. The microorganism of claim 1, wherein the microorganism is a C1-fixing microorganism.
- 10 16. The microorganism of claim 1, wherein the microorganism is a Wood-Ljungdahl microorganism.
17. The microorganism of claim 1, wherein the microorganism is a bacterium.
18. The microorganism of claim 1, wherein the microorganism is a member of a genus selected from *Acetobacterium*, *Alkalibaculum*, *Blautia*, *Butyribacterium*, *Clostridium*, 15 *Eubacterium*, *Moorella*, *Oxobacter*, *Sporomusa*, and *Thermoanaerobacter*.
19. A method of producing a product comprising culturing the microorganism of claim 1 in the presence of a gaseous substrate.
20. The method of claim 19, wherein the gaseous substrate comprises a C1-carbon source comprising CO, CO₂, and/or H₂.
- 20 21. The method of claim 19, wherein the gaseous substrate comprises syngas or industrial waste gas.
22. The method of claim 19, wherein the product is 1-butanol, butyrate, butene, butadiene, methyl ethyl ketone, ethylene, acetone, isopropanol, lipids, 3-hydroxypropionate, terpenes, isoprene, fatty acids, 2-butanol, 1,2-propanediol, 1-propanol, 1-hexanol, 1-octanol, 25 chorismate-derived products, 3-hydroxybutyrate, 1,3-butanediol, 2-hydroxyisobutyrate or 2-hydroxyisobutyric acid, isobutylene, adipic acid, 1,3-hexanediol, 3-methyl-2-butanol, 2-buten-1-ol, isovalerate, isoamyl alcohol, or monoethylene glycol.