CLAIMS

1. A promoter inducible by 3-hydroxypropionic acid (3-HP) or a derivative thereof, the promoter comprising a binding site to a LysR protein which is reactive to 3-HP or a derivative thereof, wherein the derivative is selected from 3-hydroxyisobutyrate(3HIB) or 3-hydroxybutyrate(3-HB), and the binding site is consisting of i) a base sequence selected from SEQ ID NOs: 5 to 43 or ii) an inverted repeat sequence consisting of a base sequence selected from SEQ ID NOs: 5 to 43 and another inverted repeat sequence paired with therewith by twice repeat.

2. The promoter of claim 1, wherein the promoter is derived from a microorganism having 3-HP degradability.

3. The promoter of claim 2, wherein the microorganism is one selected from the group consisting of *Achromobacter denitrificans, Acidovorax avenae subsp., Acidovorax sp., Acinetobacter baumannii, Aeromonas hydrophilia, Agrobacterium sp.*, *Alcaligenes faecalis, Alcanivorax hongdengensis, Alicycliphilus denitrificans, Alteromonas marina, Amycolatopsis sp.*, *Anaeromyxobacter dehalogenans*, *Azospirillum brasilense*, *Azotobacter vinelandii*, *Beijerinckia indica*, *Bordetella avium*, *Bradyrhizobium japonicum*, *Burkholderia ambifaria*, *Catenulispora acidiphilia*, *Caulobacter sp.*, *Castellaniella defragrans*, *Chromobacterium violaceum*, *Collimonas arenae*, *Comamonas testosteroni*, *Corynebacterium vitaeruminis*, *Cupriavidus necator*, *Curvibacter gracilus*, *Delftia acidovorans*, *Ferrimonas balearica*, *Glaciecola nitratireducens*, *Gordonia bronchialis*, *Hahella chijuensis*, *Halomonas elongata*, *Hirschia litorea*, *Idiomarina sp*., *Janthinobacterium lividum*, *Kitasatospora setae*, *Kutzneria albida*, *Methylobacterium sp.*, *Methylocystis* sp., *Novosphingobium sp*., *Oceanimonas smirnovii*, *Paracoccus sp.*, *Parvibaculum lavamentivorans*, *Phenylobacterium kunshanensis*, *Photobacterium gaetbuleda*, *Polynucleobacter necessarius asymbioticus*, *Pseudoalteromonas carrageenovora*, *Pseudogulbenkiania sp*., *Pseudomonas denitrificans* ATCC13867, *P. knackmussii*, *P. protegens*, *P. fluorescens*, *Pseudoxanthomonas spadix*, *Psychrobacter phenylpyruvicus*, *Ralstonia oxalatica*, *Rhodomicrobium vannielli*, *Segniliparus rotundus*, *Shewanella oneidensis*, *Simiduia agarovorans*, *Sinorhizobium meliloti*, *Sphingobium chlorophenolicum*, *Sphingomonas wittichii*, *Sphingopyxis alaskensis*, *Stenotrophomonas maltophilia*, *Streptomyces nodosus*, *Tatlockia micdadei*, *Thalassospira xiamenensis*, *Variovorax paradoxus*, *Verminephrobacter eiseniae*, *Vibrio furnissii*, *Xanthobacter autotrophicus*, *Xanthomonas campestri*, and *Xanthomonas oryzae*.

4. The promoter of claim 1, wherein the LysR protein comprises an N-terminal domain having a helix-turn-helix structure and binding to DNA, a C-terminal domain binding

to 3-HP or a derivative thereof, and a C-terminal domain contributing to stabilization of a LysR protein dimer.

5. The promoter of claim 4, wherein the N-terminal domain having a helix-turn-helix structure and binding to DNA comprises an amino acid sequence represented by SEQ ID NO: 1 or 2.

6. The promoter of claim 4, wherein the C-terminal domain binding to 3-HP or a derivative thereof comprises an amino acid sequence represented by SEQ ID NO: 3.

7. The promoter of claim 4, wherein the C-terminal domain contributing to stabilization of a LysR protein dimer comprises an amino acid sequence represented by SEQ ID NO: 4.

8. The promoter of claim 1, wherein the binding site to a LysR protein comprises two LysR protein dimers that are bonded to each other.

9. The promoter of claim 1, wherein the binding site to a LysR protein comprises a base sequence selected from SEQ ID NOs: 44 or 45.

10. A recombinant expression vector comprising the promoter of any one of claims 1 to 8, and 9.

11. The recombinant expression vector of claim 10, wherein the recombinant expression vector further comprises a gene encoding a foreign protein linked to the promoter inducible by 3-hydroxypropionic acid (3-HP) or a derivative thereof, wherein the derivative is selected from 3-hydroxyisobutyrate(3HIB) or 3-hydroxybutyrate(3-HB).

12. The recombinant expression vector of claim 11, the foreign protein is glycerol dehydratase (DhaB), DhaB reactivase (GdrAB), or α-ketoglutaric semialdehyde dehydrogenase (KGSADH).

13. A recombinant microorganism transformed with the recombinant expression vector of claim 10.

14. The recombinant microorganism of claim 13, wherein the recombinant microorganism has producibility of 3-HP.

15. The recombinant microorganism of claim 14, wherein the recombinant microorganism is *Pseudomonas denitrificans*.

16. The recombinant microorganism of claim 14, wherein the recombinant microorganism is a stain of *Pseudomonas denitrificans* Δ3hpdhΔ3hibdhIV△3hibdhI from which 3*hpdh*, 3*hibdh*, and *mmsadh* genes relating to degradation of 3-HP are deleted in a strain of *P. denitrificans*.

17. A method of producing 3-hydroxypropionic acid (3-HP), the method comprising:

culturing the recombinant microorganism with 3-HP producibility transformed with the recombinant expression vector of claim 10.

18. A recombinant gene expression cassette reactive to 3-hydroxypropionic acid (3-HP) or a derivative thereof, the recombinant gene expression cassette comprising a lysR gene encoding a LysR protein that is reactive to 3-HP or a derivative thereof, a promoter comprising a binding site to a LysR protein, and a gene encoding a target expression protein, wherein the derivative is selected from 3-hydroxyisobutyrate(3HIB) or 3-hydroxybutyrate(3-HB).

19. The recombinant gene expression cassette of claim 18, wherein the LysR protein or the promoter is derived from a microorganism having degradability of 3-HP.

20. The recombinant gene expression cassette of claim 19, wherein the microorganism having degradability of 3-HP is one selected from the group consisting of *Achromobacter denitrificans, Acidovorax avenae subsp., Acidovorax sp., Acinetobacter baumannii, Aeromonas hydrophilia, Agrobacterium sp.*, *Alcaligenes faecalis, Alcanivorax hongdengensis, Alicycliphilus denitrificans, Alteromonas marina, Amycolatopsis sp.*, *Anaeromyxobacter dehalogenans*, *Azospirillum brasilense*, *Azotobacter vinelandii*, *Beijerinckia indica*, *Bordetella avium*, *Bradyrhizobium japonicum*, *Burkholderia ambifaria*, *Catenulispora acidiphilia*, *Caulobacter sp.*, *Castellaniella defragrans*, *Chromobacterium violaceum*, *Collimonas arenae*, *Comamonas testosteroni*, *Corynebacterium vitaeruminis*, *Cupriavidus necator*, *Curvibacter gracilus*, *Delftia acidovorans*, *Ferrimonas balearica*, *Glaciecola nitratireducens*, *Gordonia bronchialis*, *Hahella chijuensis*, *Halomonas elongata*, *Hirschia litorea*, *Idiomarina sp*., *Janthinobacterium lividum*, *Kitasatospora setae*, *Kutzneria albida*, *Methylobacterium sp.*, *Methylocystis* sp., *Novosphingobium sp*., *Oceanimonas smirnovii*, *Paracoccus sp.*, *Parvibaculum lavamentivorans*, *Phenylobacterium kunshanensis*, *Photobacterium gaetbuleda*, *Polynucleobacter necessarius asymbioticus*, *Pseudoalteromonas carrageenovora*, *Pseudogulbenkiania sp*., *Pseudomonas denitrificans* ATCC13867, *P. knackmussii*, *P. protegens*, *P. fluorescens*, *Pseudoxanthomonas spadix*, *Psychrobacter phenylpyruvicus*, *Ralstonia oxalatica*, *Rhodomicrobium vannielli*, *Segniliparus*

rotundus, *Shewanella oneidensis*, *Simiduia agarovorans*, *Sinorhizobium meliloti*, *Sphingobium chlorophenolicum*, *Sphingomonas wittichii*, *Sphingopyxis alaskensis*, *Stenotrophomonas maltophilia*, *Streptomyces nodosus*, *Tatlockia micdadei*, *Thalassospira xiamenensis*, *Variovorax paradoxus*, *Verminephrobacter eiseniae*, *Vibrio furnissii*, *Xanthobacter autotrophicus*, *Xanthomonas campestri*, and *Xanthomonas oryzae*.

21. The recombinant gene expression cassette of claim 18, wherein the LysR protein comprises an N-terminal domain having a helix-turn-helix structure and binding to DNA, a C-terminal domain binding to 3-HP or a derivative thereof, and a C-terminal domain contributing to stabilization of a LysR protein dimer.

22. The recombinant gene expression cassette of claim 21, wherein the N-terminal domain having a helix-turn-helix structure and binding to DNA comprises an amino acid sequence represented by SEQ ID NO: 1 or 2.

23. The recombinant gene expression cassette of claim 21, wherein the C-terminal domain binding to 3-HP or a derivative thereof comprises an amino acid sequence represented by SEQ ID NO: 3.

24. The recombinant gene expression cassette of claim 21, wherein the C-terminal domain contributing to stabilization of a LysR protein dimer comprises an amino acid sequence represented by SEQ ID NO: 4.

25. The recombinant gene expression cassette of claim 18, wherein the binding site to a LysR protein comprises a base sequence selected from SEQ ID NOs: 5 to 43.

26. The recombinant gene expression cassette of claim 25, wherein the binding site to a LysR protein comprises an inverted repeat sequence and an inverted repeat sequence paired with therewith are repeated twice, wherein the inverted repeat sequence comprises a base sequence selected from SEQ ID NOs: 5 to 43.

27. The recombinant gene expression cassette of claim 26, wherein the binding site to a LysR protein comprises a base sequence selected from SEQ ID NOs: 44 or 45.

28. A recombinant expression vector comprising the recombinant gene expression cassette of any one of claims 18 to 27.

29. A recombinant microorganism transformed with the recombinant expression vector of claim 28.

30. A recombinant microorganism comprising the recombinant gene expression cassette of any one of claims 18 to 27 inserted to a chromosome of a host cell.

31. A method of producing a target expression protein, the method comprising:

culturing the recombinant microorganism with 3-HP producibility transformed with the recombinant expression vector of claim 28.

32. The method of claim 31, wherein the culturing of the recombinant microorganism further comprises adding for 3-hydroxypropionic acid (3-HP) to the culture.