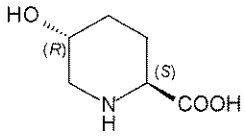
hydroxylase polypeptides with improved properties. Exemplary polynucleotide sequences are provided in the Sequence Listing incorporated by reference herein and include SEQ ID NO: 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, and 227.

[0015a] In one aspect, there is provided a polynucleotide encoding the engineered polypeptide of ~~SEQ ID NO: 2~~any one of the polypeptides described herein, comprising a nucleic acid sequence optimized for expression in *E. coli*, optionally comprising a sequence having at least 80% or more identity to a nucleic acid sequence selected from SEQ ID NO: 1, and 3~~, and 5~~.

[0016] In a further embodiment, the present disclosure also provides codon optimized polynucleotides encoding a polypeptide that comprises an amino acid sequence of the wild-type proline hydroxylase (SEQ



(1*R*)

10. The engineered polypeptide of claim 1 having proline hydroxylase activity in which the amino acid sequence comprises a sequence selected from the group consisting of SEQ ID NO: 24, 8, 10, 12, 14, 16, 18, 20, 22, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, and 228.

11. A polynucleotide encoding the engineered polypeptide of any one of claims 1 to 10, the polynucleotide optionally comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO: 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, and 227.

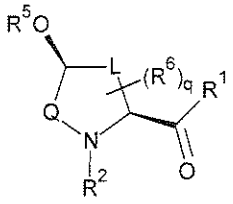
12. A polynucleotide encoding the engineered polypeptide of ~~SEQ ID NO: 2~~any one of claims 1 to 10, comprising a nucleic acid sequence optimized for expression in *E. coli*, optionally comprising a sequence having at least 80% or more identity to a nucleic acid sequence selected from SEQ ID NO: 1 and~~, 3, and 5~~.

13. An expression vector comprising the polynucleotide of claim 11 or 12, optionally further comprising a control sequence.

14. A host cell comprising the polynucleotide of claim 11 or 12, optionally wherein the host cell is *E. coli*.

15. A method of preparing the engineered polypeptide of any one of claims 1 to 10, comprising culturing the host cell of claim 14 under conditions suitable for expression of the polypeptide, optionally the method further comprising a step of isolating the engineered polypeptide.

16. A process for preparing a product compound of formula **(Ia)**,



(Ia)