What is claimed is:

1. An engineered polypeptide having transaminase activity comprising a polypeptide sequence having at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to SEQ ID NO: 2, 6, 332, 518, 656 and/or ~~656~~808, or a functional fragment thereof, wherein:
   a) said engineered polypeptide has increased thermoactivity in wet organic solvents compared to the engineered polypeptide of SEQ ID NO:6; and
   b) the polypeptide sequence of said engineered polypeptide comprises residues 155W and 284A,~~at least one substitution or substitution set and~~ wherein the amino acid positions of said polypeptide sequence are numbered with reference to SEQ ID NO: ~~808, 2, 6, 332, 518 and/or 656~~.

2. The engineered polypeptide of Claim 1, wherein ~~said polypeptide sequence has at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to SEQ ID NO:2, and wherein the polypeptide sequence of said~~ the engineered polypeptide further comprises at least one substitution ~~or substitution set~~ at one or more positions in said polypeptide sequence selected from the group consisting of 9, 20, 23,39, 55, 134, 150, 160, 178, 199, 244, ~~284~~ and ~~284/155~~273, wherein the amino acid positions of said polypeptide sequence are numbered with reference to SEQ ID NO:2.

3. The engineered polypeptide according to claim 2, wherein the at least one substitution at one or more positions in said polypeptide sequence results in a sequence comprising any one or more of 9H, 20T, 23Q, 39G, 55V, 89Q, 134S, 150W, 160Y, 178S, 199L, 244G and 273L, wherein the amino acid positions of said polypeptide sequence are numbered with reference to SEQ ID NO: 2.

4. The engineered polypeptide according to claim 2 or claim 3, wherein the at least one substitution at one or more positions comprises a substitution set selected from the group consisting of:
   a) 20/23/134/244;
   b) 9/20/23/89/134/160/244;
   c) 9/20/23/89/134/160/199/244; and
   d) 9/20/23/39/55/89/134/150/160/178/199/244/273.

5. The engineered polypeptide according to claim 4, wherein the substitution set results in a sequence comprising:
   a) 20T/23Q/134S/244G;

b) 9H/20T/23Q/89Q/134S/160Y/244G;

c) 9H/20T/23Q/89Q/134S/160Y/199L/244G; or

d) 9H/20T/23Q/39G/55V/89Q/134S/150W/160Y/178S/199L/244G/273L.

3. ~~The engineered polypeptide of Claim 1, wherein said polypeptide sequence has at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to SEQ ID NO:6, and wherein the polypeptide sequence of said engineered polypeptide comprises at least one substitution or substitution set at one or more positions in said polypeptide sequence selected from 5/35, 9, 9/20/23/24/134/244, 9/20/23/101/244, 9/20/24/101/244/249, 9/23/24, 9/23/24/29/244, 9/23/24/101/262, 9/23/24/244/262, 9/23/29, 9/24/244, 9/24/244/262, 9/24/249, 9/45/89/93, 9/79/101/244, 9/82/89, 9/89/246, 9/89/271, 9/93/142/246, 9/101/244, 9/110/302, 9/244/249, 9/244/262/264, 9/246, 9/262, 15, 15/16/18/20/89/93/160, 15/24/26/89/93/160, 15/35/273, 15/218/273, 15/249/273, 16, 17/25, 17/25/41, 17/25/160, 17/160, 18, 18/26/246/273, 18/146, 18/146/168, 18/146/262, 18/168, 18/168/244, 18/168/262/324, 18/244, 18/244/246, 18/244/246/284, 18/244/248, 18/244/262/273, 18/244/273, 18/262, 18/273, 20, 20/23/24/55/134/244/262, 20/23/134/244, 20/24/89/197, 20/33/160, 20/324, 22, 22/102, 22/160, 23, 23/25/55/321, 23/25/102/142, 23/102, 23/321, 24, 25, 25/33, 25/104, 25/160, 25/321, 26, 26/273, 29, 29/89, 32, 33, 35, 35/215/218/249, 35/218/249/273, 35/221, 40, 40/168/208/244, 40/244/248, 41, 41/102, 42, 45, 46, 50, 55, 56, 71/102, 74, 79, 82, 82/244, 89, 89/93/156/324, 89/93/321/324, 90, 93, 93/324, 95, 98, 101, 101/160/244/249, 102, 104, 106, 111, 114, 117, 119, 134, 134/244, 134/262, 139, 140/266, 142, 142/321, 145, 146, 146/244, 146/273, 156, 160, 160/215/216/218, 160/273, 168, 168/244/273, 179, 186, 186/200, 197, 203, 207, 208, 208/246, 215, 215/216/249, 216, 216/273, 218, 218/249, 218/313, 234, 236, 244, 244/248, 244/248/284, 244/273, 246, 246/248/273, 248, 249, 249/273, 256, 262, 264, 265, 266, 271, 273, 284, 301, 316, 320, 321, 324, and 329, wherein the amino acid positions of said polypeptide sequence are numbered with reference to SEQ ID NO:6.~~

4. ~~The engineered polypeptide of Claim 1, wherein said polypeptide sequence has at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to SEQ ID NO:332, and wherein the engineered polypeptide comprises at least one substitution or substitution set at one or more positions in said polypeptide sequence selected from 9/89/93/101/160, 9/89/160, 33, 35, 44, 49, 74, 89, 89/93/160/249, 107, 108, 117, 140, 141, 142, 144, 156, 168, 203, 207, 234, 270, 273, 274, 292, 296, 297, 300, 302, 305, 317, 319, 321, 323, 327, and 329, wherein the amino acid positions of said polypeptide sequence are numbered with reference to SEQ ID NO:332.~~

5. The engineered polypeptide of Claim 1, wherein said polypeptide sequence has at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to SEQ ID NO:518, and wherein the engineered polypeptide comprises at least one substitution or substitution set at one or more positions in said polypeptide sequence selected from 35/273, 46/273, 111/159/273, 159, 159/273, 174, 199, 273, and 287, wherein the amino acid positions of said polypeptide sequence are numbered with reference to SEQ ID NO:518.

6. The engineered polypeptide of Claim 1, wherein said polypeptide sequence has at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to SEQ ID NO:332, wherein said engineered polypeptide has increased thermoactivity in wet organic solvents compared to the engineered polypeptide of SEQ ID NO:332, and wherein the engineered polypeptide comprises at least one substitution or substitution set at one or more positions in said polypeptide sequence selected from 23/29/55, 34, 44, 74, 92, 108, 117, 140, 141, 144, 156, 160, 168, 215, 256, 269, 270, 274, 292, 296, 302, 319, 323, and 329, wherein the amino acid positions of said polypeptide sequence are numbered with reference to SEQ ID NO:332.

7. The engineered polypeptide of Claim 1, wherein said polypeptide sequence has at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to SEQ ID NO:518, wherein said engineered polypeptide has increased thermoactivity in wet organic solvents compared to the engineered polypeptide of SEQ ID NO:518, and wherein the engineered polypeptide comprises at least one substitution or substitution set at one or more positions in said polypeptide sequence selected from 34/74/92, 35/273/323, 39, 46/273, 48, 55, 74/92, 126, 133, 138, 150, 160/215/329, 178, 199, 207, 273, and 292, wherein the amino acid positions of said polypeptide sequence are numbered with reference to SEQ ID NO:518.

8. The engineered polypeptide of Claim 1, wherein said polypeptide sequence has at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to SEQ ID NO:656, wherein said engineered polypeptide has increased thermoactivity in wet organic solvents compared to the engineered polypeptide of SEQ ID NO:656, and wherein the engineered polypeptide comprises at least one substitution or substitution set at one or more positions in said polypeptide sequence selected from 18, 35/39/55/138/150, 35/39/55/150, 35/39/126/150/273, 35/39/133, 35/39/133/150/273, 35/39/150, 35/39/150/273, 35/133/178, 35/138/150/273, 35/150/273, 35/178/273, 35/273, 39, 39/55/150/178/273, 39/55/150/273, 39/126/150, 39/133/150, 39/133/178/273, 39/133/273, 39/150/178, 39/150/178/207, 39/150/178/207/273, 39/150/273, 39/178, 39/178/273, 39/207,

~~39/207/273, 39/273, 44, 55, 55/150, 88, 126, 126/133/178, 126/138/178, 126/178/207, 132, 138/150/178, 141, 150, 150/178/273/323, 150/178/323, 150/207/273, 150/273, 168, 178/273, 239, 261, 263, 269, 273, 297, and 312, wherein the amino acid positions of said polypeptide sequence are numbered with reference to SEQ ID NO:656.~~

~~9. The engineered polypeptide of any of Claims 6-8, wherein said engineered polypeptide has increased thermoactivity in a wet organic solvent relative to the engineered polypeptide of SEQ ID NO:6.~~

~~10. The engineered polypeptide of Claim 1, wherein said engineered polypeptide comprises a polypeptide sequence that is at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99% or more identical to the sequence of at least one engineered polypeptide variant set forth in Table 1, 2, 3, 4, 5, 6, 7, and/or 8.~~

~~11. The engineered polypeptide of Claim 1, wherein said engineered polypeptide comprises a polypeptide sequence that is at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99% or more identical to SEQ ID NO:2, 6, 332, 518, and/or 656.~~

~~12. The engineered polypeptide of Claim 1, wherein said engineered polypeptide comprises a variant engineered polypeptide set forth in SEQ ID NO:6, 332, 518, and/or 656.~~

~~13. The engineered polypeptide of Claim 1, wherein said engineered polypeptide comprises a polypeptide sequence that is at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99% or more identical to the sequence of at least one engineered polypeptide variant set forth in the even numbered sequences of SEQ ID NOS: 4-846.~~

~~14. The engineered polypeptide of Claim 1, wherein said engineered polypeptide comprises a polypeptide sequence forth in at least one of the even numbered sequences of SEQ ID NOS: 4-846.~~

~~15~~6. A polynucleotide sequence encoding at least one engineered polypeptide of any one of ~~Claims~~ claims 1 to 5 ~~-14~~.

~~16. A polynucleotide sequence encoding at least one engineered polypeptide, said polynucleotide sequence comprising at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to SEQ ID NOS: 1, 5, 331, 517, and/or 655,~~

~~wherein the polynucleotide sequence of said engineered polypeptide comprises at least one substitution at one or more positions.~~

~~17. A polynucleotide sequence encoding at least one engineered polypeptide comprising at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to SEQ ID NOS: 1, 5, 331, 517, and/or 655, or a functional fragment thereof.~~

~~18~~7. The polynucleotide sequence ~~of any~~ of ~~Claims~~ claim ~~15-17~~6, wherein said polynucleotide sequence is operably linked to a control sequence.

~~19~~8. The polynucleotide sequence ~~of any~~ of ~~Claims~~ claim 6 or claim 7~~15-17~~, wherein said polynucleotide sequence is codon optimized.

~~20. The polynucleotide sequence of any of Claims 15-17, wherein said polynucleotide sequence comprises a polynucleotide sequence forth in the odd numbered sequences of SEQ ID NOS: 3-845.~~

~~21~~9. An expression vector comprising at least one polynucleotide sequence of any one of ~~Claims~~ claims 6 to 8~~15-20~~.

~~22~~10. A host cell comprising at least one expression vector of ~~Claim~~ claim ~~21~~10.

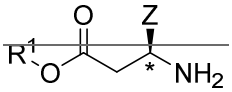
~~23~~11. A host cell comprising at least one polynucleotide sequence of any one of ~~Claims~~ claims ~~15-20~~6 to 10.

~~24~~12. A method of producing an engineered polypeptide in a host cell, comprising culturing the host cell of ~~Claim~~ claim ~~22-~~10 and/or ~~23~~claim 11, under suitable conditions, such that at least one engineered polypeptide is produced.

~~25~~13. The method of ~~Claim~~ claim ~~24~~12, further comprising recovering at least one engineered polypeptide from the culture and/or host cell.

~~26~~14. The method of ~~Claim~~ claim ~~24-~~12 and/or ~~25~~claim 13, further comprising the step of purifying said at least one engineered polypeptide.

~~27. A process for preparing a compound of structural Formula (I):~~



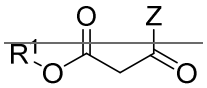
(I)

having the indicated stereochemical configuration at the stereogenic center marked with an *; in an enantiomeric excess of at least 70% over the opposite enantiomer,

wherein

Z is a linear C_{1-6} alkyl or a branched C_{1-6} alkyl, optionally substituted with one or more hydroxy, cyano, or nitro groups ; and

R^1 is C_{1-6} alkyl, aryl C_{1-2} alkyl, heteroaryl C_{1-2} alkyl, or a 5- to 6-membered heterocyclic ring system optionally containing an additional heteroatom selected from O, S, and N, the heterocyclic ring being unsubstituted or substituted with one to three substituents independently selected from oxo, hydroxy, halogen, C_{1-4} alkoxy, and C_{1-4} alkyl; the process comprising the step of contacting a compound of structural Formula (**II**):

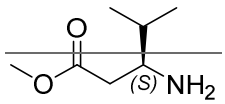


(II)

with an engineered polypeptide of any one of Claims 1 to 14 in the presence of an amino group donor under suitable reaction conditions.

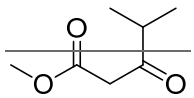
28. The process of Claim 27, wherein the compound of structural Formula (**II**) excludes compound (**2**) and the compound of structural Formula (**I**) excludes compound (**1**).

29. A process of preparing compound (**1**),



(1)

the process comprising a step of contacting a substrate of compound (**2**)



(2)

with an engineered polypeptide of any one of Claims 1 to 14, in the presence of an amino group donor under suitable reaction conditions.

30. The process of any one of Claims 27 to 29, wherein the compound of Formula (**I**) or the compound (**1**) is produced in at least 90% enantiomeric excess.

31. The process of any one of Claims 27 to 29, wherein the compound of Formula (**I**) or the compound (**1**) is produced in at least 99% enantiomeric excess.

32. The process of any one of Claims 27 to 29, wherein the amino group donor is selected from isopropylamine, alanine, 3-aminobutyric acid, or methylbenzylamine.

33. The process of any one of Claims 27 to 29, wherein the amino group donor is isopropylamine, optionally at a concentration of about 0.1 to about 3.0 M, 0.2 to about 2.5 M, about 0.5 to about 2 M, or about 1 to about 2 M.

34. The process of any one of Claims 27 to 29, wherein the suitable reaction conditions comprise a temperature of about 45°C to about 60°C.

35. The process of any one of Claims 27 to 29, wherein the suitable reaction conditions comprise a wet organic solvent.

36. The process of Claim 35, wherein the wet organic solvent is selected from wet isopropyl acetate, wet toluene, wet methyl tertiary-butyl ether, wet acetonitrile, or wet isopropyl alcohol.

37. The process of Claim 36, wherein the wet organic solvent is isopropyl acetate.

38. The process of any one of Claims 27 to 29, wherein the suitable reaction conditions comprise the substrate compound at a loading of about 5 g/L to about 200 g/L, about 10 g/L to about 150 g/L, or about 50 g/L to about 100 g/L.

39. The process of any one of Claims 27 to 29, wherein the suitable reaction conditions comprise the engineered polypeptide at a concentration of from about 0.5 g/L to about 5 g/L, about 0.5 g/L to about 3 g/L, about 0.5 g/L to about 2 g/L, or from about 0.5 g/L to about 1 g/L.

40. The process of Claim 29, wherein the suitable reaction conditions comprise: (a) substrate loading of about 10 to 220 g/L of substrate compound (**2**); (b) engineered polypeptide concentration of

~~about 0.5 g/L to 25 g/L; (c) isopropylamine concentration of about 0.1 to 3 M; (d) a wet organic solvent; and (e) temperature of about 30°C to 60°C.~~

41. ~~The process of Claim 29, wherein the suitable reaction conditions comprise: (a) about 20 g/L of substrate compound (**2**); (b) about 20 g/L engineered polypeptide; (c) wet isopropyl acetate; (d) about 0.55 M isopropylamine; and (e) about 50°C.~~

42. ~~The process of any one of Claims 27 to 29, further comprising the step of isolating the compound of Formula (**I**) or the compound (**1**) from the reaction.~~