

CLAIMS

~~What is claimed is:~~

1. ~~— A fusion polypeptide comprising a plurality of polypeptide segments of one or more human immunodeficiency virus 1 (HIV 1) proteins encoded by two or more HIV genes selected from *gag*, *pol* and *nef*.~~

2. ~~— The fusion polypeptide of claim 1, wherein the plurality of polypeptide segments comprises or consists of polypeptide segments encoded by HIV 1 genes *pol* and *nef*, and does not comprise polypeptide segments encoded by HIV 1 genes *env*, *tat*, *rev*, *vpr*, *vif* and *vpu*.~~

3. ~~— The fusion polypeptide of any one of claims 1 to 2, wherein the plurality of polypeptide segments comprises or consists of polypeptide segments encoded by HIV 1 genes *gag*, *pol* and *nef*, and does not comprise polypeptide segments encoded by HIV 1 genes *env*, *tat*, *rev*, *vpr*, *vif* and *vpu*.~~

4. ~~— The fusion polypeptide of any one of claims 1 to 3, wherein the polypeptide segments are derived from conserved regions in a population of viral proteome sequences.~~

5. ~~— The fusion polypeptide of claim 4, wherein the conserved regions are greater than 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% conserved amongst HIV 1 species in interpatient populations.~~

6. ~~— The fusion polypeptide of any one of claims 4 to 5, wherein the conserved regions are conserved amongst one or more of HIV 1 clades A, K, *e.g.*, one or more of clades A, B, C, D and G, or recombinant forms of one or more of HIV 1 clades A, K, and combinations thereof.~~

7. ~~— The fusion polypeptide of any one of claims 1 to 6, comprising at least 4 and up to 6 polypeptide segments, *e.g.*, 4, 5 or 6 polypeptide segments.~~

8. ~~— The fusion polypeptide of any one of claims 1 to 7, wherein each polypeptide segment is at least 10 amino acids in length, and up to about 225 amino acids in~~

~~length, e.g. from at least 10 amino acids in length up to 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200, 205, 210, 215, 220 or 225 amino acids in length.~~

~~9. — The fusion polypeptide of any one of claims 1 to 8, wherein the full length of the fusion polypeptide comprises at least about 330 amino acids and up to about 550 amino acids, e.g., at least about 330 amino acids and up to about 335, 340, 345, 350, 355, 360, 365, 370, 375, 380, 385, 390, 400, 405, 410, 415, 420, 425, 430, 435, 440, 445, 450, 455, 460, 465, 470, 475, 480, 485, 490, 495, 500, 505, 510, 515, 520, 525, 530, 535, 540, 545 or 550 amino acids.~~

~~10. — The fusion polypeptide of any one of claims 1 to 9, wherein the full length of the fusion polypeptide is no longer than 550 amino acids, e.g. no longer than 545, 540, 535, 530, 525, 520, 515, 510, 505, 500, 495, 490, 485, 480, 475, 470, 465, 460, 455, 450, 445, 440, 435, 430, 425, 420, 415, 410, 405, 400, 390, 385, 380, 375, 370, 365, 360, 355, 350, 345, 340, 335 or 330 amino acids.~~

~~11. — The fusion polypeptide of any one of claims 1 to 10, wherein the full length of the fusion polypeptide comprises at least 350 amino acids and up to 385 amino acids, e.g., at least 350 amino acids and up to 365 amino acids.~~

~~12. — The fusion polypeptide of any one of claims 1 to 11, wherein each polypeptide segment comprises or consists of one or more predicted T cell epitopes.~~

~~13. — The fusion polypeptide of any one of claims 1 to 12, comprising one or more polypeptide segments that bind to or are presented by one or more human HLA class I alleles (e.g. 1, 2, 3, 4, 5 or 6 alleles), e.g. within a single subject or amongst multiple patients.~~

~~14. — The fusion polypeptide of any one of claims 1 to 13, comprising one or more polypeptide segments that bind to or are presented by at least by a human A*0201 HLA class I molecule.~~

15. — The fusion polypeptide of any one of claims 1 to 14, comprising one or more polypeptide segments that are intracellularly processed and presented by one or more human HLA class II alleles (*e.g.* 1, 2, 3, 4, 5 or 6 alleles), *e.g.* within a single subject.

16. — The fusion polypeptide of any one of claims 1 to 15, wherein one or more of the polypeptide segments is abutted or fused to an adjacent segment.

17. — The fusion polypeptide of any one of claims 1 to 15, wherein one or more of the polypeptide segments is joined to an adjacent segment by one or more peptide linkers.

18. — The fusion polypeptide of claim 17, wherein the one or more peptide linkers is selected from one or more of a polyalanine, a polyglycine, Gln-Glu-Glu (QEE) (SEQ ID NO: 51), Lysine (L), Isoleucine (I), Leu-Ile (LI), Lys-Ile-Leu (KIL) (SEQ ID NO: 52), Leu-Ile-Lys (LIK) (SEQ ID NO: 53), Pro-Pro-Val (PPV) (SEQ ID NO: 54), Ser-Glu-Gly (SEG) (SEQ ID NO: 55), a cleavable linker, a flexible linker, a rigid linker, and combinations thereof.

19. — The fusion polypeptide of claim 18, wherein the flexible linker is selected from Gln-Glu-Glu (QEE) (SEQ ID NO: 51), Lysine (L), Isoleucine (I), Leu-Ile (LI), Lys-Ile-Leu (KIL) (SEQ ID NO: 52), Leu-Ile-Lys (LIK) (SEQ ID NO: 53), Pro-Pro-Val (PPV) (SEQ ID NO: 54) and Ser-Glu-Gly (SEG) (SEQ ID NO: 55).

20. — The fusion polypeptide of claim 18, wherein the flexible linker comprises a polyalanine linker or a polyglycine linker.

21. — The fusion polypeptide of any one of claims 18 to 20, wherein the polyalanine linker comprises or consists of 2 or 3 contiguous alanine residues, *e.g.* AA, AAA (SEQ ID NO: 48), AAY (SEQ ID NO: 49) or AAX, wherein X is any amino acid (*e.g.* A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, Y) (SEQ ID NO: 50).

22. — The fusion polypeptide of claim 18, wherein the flexible linker comprises or consists of GG, GGS (SEQ ID NO: 57), GSG (SEQ ID NO: 58) or GGS (SEQ ID NO: 59).

23. — The fusion polypeptide of claim 18, wherein the cleavable linker is selected from a 2A cleavable peptide (*e.g.* foot-and-mouth disease virus (F2A), equine

rhinitis A virus (E2A), porcine teschovirus 1 (P2A) and Thosa asigna virus (T2A)), a furin recognition/cleavage sequence (*e.g.* RAKR (SEQ ID NO: 60), REKR (SEQ ID NO: 61) and RRKR (SEQ ID NO: 62)), and combinations, derivatives or variants thereof.

24. — The fusion polypeptide of claim 23, wherein the cleavable linker comprises or consists of a furin recognition/cleavage site selected from RAKR (SEQ ID NO: 60), REKR (SEQ ID NO: 61) and RRKR (SEQ ID NO: 62).

25. — The fusion polypeptide of any one of claims 23 to 24, wherein the cleavable linker comprises or consists of the amino acid sequence that is at least 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or at least 99% identical to ATNFSLLKQAGDVEENPGP (SEQ ID NO: 63), APVKQTLNFDLLKLAGDVESNPGP (SEQ ID NO: 64), RAKRAPVKQTLNFDLLKLAGDVESNPGP (SEQ ID NO: 65), QCTNYALLKLAGDVESNPGP (SEQ ID NO: 66), or EGRGSLLTCGDVEENPGP (SEQ ID NO: 67), or comprises or consists of the amino acid sequence of ATNFSLLKQAGDVEENPGP (SEQ ID NO: 63), APVKQTLNFDLLKLAGDVESNPGP (SEQ ID NO: 64), RAKRAPVKQTLNFDLLKLAGDVESNPGP (SEQ ID NO: 65), QCTNYALLKLAGDVESNPGP (SEQ ID NO: 66), or EGRGSLLTCGDVEENPGP (SEQ ID NO: 67).

26. — The fusion polypeptide of any one of claims 1 to 25, comprising two, three, four, five, six, or more, of the polypeptide segments comprising or consisting of amino acid residues corresponding to Gag 1-53; Gag 147-369; Pol 56-117; Pol 129-320; Pol 367-431; Pol 542-606; Pol 586-606; Pol 683-708; Pol 747-827; Pol 840-909; Pol 840-920; Pol 932-1003; Nef 64-76; Nef 64-99 or Nef 117-148, wherein the Gag, Pol and Nef amino acid position numbers correspond to SEQ ID NOs: 1, 2 and 3, respectively.

27. — The fusion polypeptide of any one of claims 1 to 26, wherein the fusion polypeptide does not comprise any polypeptide segments corresponding to Gag 54-146; Gag 370-500; Pol 1-55; Pol 118-128; Pol 321-366; Pol 432-541; Pol 607-682; Pol 709-746; Pol 828-839; Pol 921-931; Nef 1-63; Nef 100-116 and Nef 149-206, or fragments or subsequences thereof, wherein the Gag, Pol and Nef amino acid position numbers correspond to SEQ ID NOs: 1, 2 and 3, respectively.

28. — The fusion polypeptide of any one of claims 1 to 27 wherein the fusion polypeptide does not comprise any polypeptide segments having an amino acid

~~sequence of SEQ ID NOs: 35-47, or fragments or subsequences thereof, or an amino acid sequence at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 35-47, or fragments or subsequences thereof.~~

~~29. — The fusion polypeptide of any one of claims 1 to 28, comprising two, three, four, five, six, or more, polypeptide segments selected from SEQ ID NOs: 4-33.~~

~~30. — The fusion polypeptide of any one of claims 1 to 29, comprising or consisting of the following polypeptide segments, wherein the Gag, Pol and Nef amino acid position numbers correspond to SEQ ID NOs: 1, 2 and 3, respectively:~~

~~a) — amino acid residues corresponding to: Gag 1-53; Gag 147-369; Pol 683-708 and Nef 117-148;~~

~~b) — amino acid residues corresponding to: Pol 56-117; Pol 129-320; Pol 367-431 and Nef 64-99;~~

~~c) — amino acid residues corresponding to: Pol 542-606; Pol 747-827; Pol 840-920; Pol 932-1003 and Nef 64-99;~~

~~d) — amino acid residues corresponding to: Gag 1-53; Gag 147-369; Pol 683-708; Pol 747-827; Pol 840-920 and Nef 117-148;~~

~~e) — amino acid residues corresponding to: Pol 56-117; Pol 129-320; Pol 367-431; Pol 542-606; Pol 932-1003 and Nef 64-99;~~

~~f) — amino acid residues corresponding to: Gag 147-369; Pol 586-606; Pol 683-708 and Pol 840-920;~~

~~g) — amino acid residues corresponding to: Pol 129-320, Pol 747-827, Pol 932-1003 and Nef 64-76; or~~

~~h) — amino acid residues corresponding to: Gag:147-369, Pol 747-827, Pol 840-909 and Nef 64-76.~~

~~31. — The fusion polypeptide of any one of claims 1 to 30, comprising or consisting of the following polypeptide segments:~~

~~a) SEQ ID NOs: 4, 6, 18 and 32, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 4, 6, 18 and 32, respectively;~~

- b) ~~SEQ ID NOs: 5, 7, 19 and 33, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 5, 7, 19 and 33, respectively;~~
- c) ~~SEQ ID NOs: 8, 10, 12 and 30 or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 8, 10, 12 and 30, respectively;~~
- d) ~~SEQ ID NOs: 9, 11, 13 and 31, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 9, 11, 13 and 31, respectively;~~
- e) ~~SEQ ID NOs: 14, 20, 24, 26 and 30, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 14, 20, 24, 26 and 30, respectively;~~
- f) ~~SEQ ID NOs: 15, 21, 25, 27 and 31, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 15, 21, 25, 27 and 31, respectively;~~
- g) ~~SEQ ID NOs: 4, 6, 18, 20, 24 and 32, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 4, 6, 18, 20, 24 and 32, respectively;~~
- h) ~~SEQ ID NOs: 5, 7, 19, 21, 25 and 33, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 5, 7, 19, 21, 25 and 33, respectively;~~
- i) ~~SEQ ID NOs: 8, 10, 12, 14, 26 and 30, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 8, 10, 12, 14, 26 and 30, respectively;~~
- j) ~~SEQ ID NOs: 9, 11, 13, 15, 27 and 31, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 9, 11, 13, 15, 27 and 31, respectively;~~

- k) ~~SEQ ID NOs: 6, 16, 18 and 24, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 6, 16, 18 and 24, respectively;~~
- l) ~~SEQ ID NOs: 7, 17, 19 and 25, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 7, 17, 19 and 25, respectively;~~
- m) ~~SEQ ID NOs: 10, 20, 26 and 28, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 10, 20, 26 and 28, respectively;~~
- n) ~~SEQ ID NOs: 11, 21, 27 and 29, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 11, 21, 27 and 29, respectively;~~
- o) ~~SEQ ID NOs: 6, 20, 22 and 28, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 6, 20, 22 and 28, respectively;~~
- p) ~~SEQ ID NOs: 7, 21, 23 and 29, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 7, 21, 23 and 29, respectively;~~
- q) ~~SEQ ID NOs: 6, 16, 18 and 24, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 6, 16, 18 and 24, respectively;~~
- r) ~~SEQ ID NOs: 7, 17, 19 and 25, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 7, 17, 19 and 25, respectively;~~
- s) ~~SEQ ID NOs: 10, 20, 26 and 28, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 10, 20, 26 and 28, respectively; or~~
- t) ~~SEQ ID NOs: 11, 21, 27 and 29, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 11, 21, 27 and 29, respectively.~~

32. — ~~The fusion polypeptide of any one of claims 1 to 31, comprising or consisting of the following polypeptide segments in sequential order, from N terminus to C terminus, optionally joined or connected by one or more linkers:~~

a) — ~~SEQ ID NOs: 6, 4, 18 and 32, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 6, 4, 18 and 32, respectively;~~

b) — ~~SEQ ID NOs: 7, 5, 33 and 19, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 7, 5, 33 and 19, respectively;~~

c) — ~~SEQ ID NOs: 12, 30, 8 and 10, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 12, 30, 8 and 10, respectively;~~

d) — ~~SEQ ID NOs: 9, 31, 13 and 11, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 9, 31, 13 and 11, respectively;~~

e) — ~~SEQ ID NOs: 14, 26, 20, 30 and 24, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 14, 26, 20, 30 and 24, respectively;~~

f) — ~~SEQ ID NOs: 15, 31, 21, 27 and 25, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 15, 31, 21, 27 and 25, respectively;~~

g) — ~~SEQ ID NOs: 32, 18, 4 and 6, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 32, 18, 4 and 6, respectively;~~

h) — ~~SEQ ID NOs: 7, 33, 5 and 19, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 7, 33, 5 and 19, respectively;~~

i) — ~~SEQ ID NOs: 8, 30, 12 and 10, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 8, 30, 12 and 10, respectively;~~

j) — ~~SEQ ID NOs: 13, 31, 9 and 11, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 13, 31, 9 and 11, respectively;~~

k) — ~~SEQ ID NOs: 26, 30, 14, 20 and 24, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 26, 30, 14, 20 and 24, respectively;~~

l) — ~~SEQ ID NOs: 31, 27, 15, 25 and 21, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 31, 27, 15, 25 and 21, respectively;~~

m) — ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 24, 6, 4, 20, 18 and 32, respectively;~~

n) — ~~SEQ ID NOs: 6, 20, 4, 24, 32 and 18, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 6, 20, 4, 24, 32 and 18, respectively;~~

o) — ~~SEQ ID NOs: 7, 21, 5, 25, 33 and 19, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 7, 21, 5, 25, 33 and 19, respectively;~~

p) — ~~SEQ ID NOs: 8, 30, 14, 12, 26 and 10, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 8, 30, 14, 12, 26 and 10, respectively;~~

q) — ~~SEQ ID NOs: 8, 12, 30, 26, 14 and 10, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 8, 12, 30, 26, 14 and 10, respectively;~~

r) — ~~SEQ ID NOs: 9, 13, 31, 27, 15 and 11, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 9, 13, 31, 27, 15 and 11, respectively;~~

s) — ~~SEQ ID NOs: 20, 32, 24, 4, 6 and 18, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 20, 32, 24, 4, 6 and 18, respectively;~~

t) — ~~SEQ ID NOs: 7, 25, 19, 5, 33 and 21, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 7, 25, 19, 5, 33 and 21, respectively;~~

u) — ~~SEQ ID NOs: 26, 30, 12, 14, 8 and 10, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 26, 30, 12, 14, 8 and 10, respectively;~~

v) — ~~SEQ ID NOs: 15, 31, 9, 27, 13 and 11, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 15, 31, 9, 27, 13 and 11, respectively;~~

w) — ~~SEQ ID NOs: 24, 6, 16 and 18, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 24, 6, 16 and 18, respectively;~~

x) — ~~SEQ ID NOs: 7, 19, 17 and 25, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 7, 19, 17 and 25, respectively;~~

y) — ~~SEQ ID NOs: 24, 16, 6 and 18, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 24, 16, 6 and 18, respectively;~~

z) — ~~SEQ ID NOs: 7, 25, 17 and 19, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 7, 25, 17 and 19, respectively;~~

aa) — ~~SEQ ID NOs: 26, 20, 10 and 28, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 26, 20, 10 and 28, respectively;~~

bb) — ~~SEQ ID NOs: 21, 27, 11 and 29, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 21, 27, 11 and 29, respectively;~~

cc) — ~~SEQ ID NOs: 26, 10, 20 and 28, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 26, 10, 20 and 28, respectively;~~

dd) ~~SEQ ID NOs: 11, 27, 21 and 29, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 11, 27, 21 and 29, respectively;~~

ee) ~~SEQ ID NOs: 22, 6, 20 and 28, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 22, 6, 20 and 28, respectively;~~

ff) ~~SEQ ID NOs: 23, 7, 21 and 29, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 23, 7, 21 and 29, respectively;~~

gg) ~~SEQ ID NOs: 22, 20, 6 and 28, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 22, 20, 6 and 28, respectively; or~~

hh) ~~SEQ ID NOs: 7, 21, 23 and 29, or sequence segments that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NOs: 7, 21, 23 and 29, respectively.~~

33. ~~The fusion polypeptide of any one of claims 1 to 32, comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 70-101, 105-112, 200-209, 222-223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70-101, 105-112, 200-209, 222-223 and 227.~~

34. ~~The fusion polypeptide of any one of claims 1 to 33, comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 82-83, 85-87, 98-101, 209 and 222-223, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82-83, 85-87, 98-101, 209 and 222-223.~~

35. ~~A compound fusion polypeptide comprising at least a first fusion polypeptide and a second fusion polypeptide, the first and second fusion polypeptides being independently selected from the fusion polypeptide of any one of claims 1 to 34.~~

36. ~~The compound fusion polypeptide of claim 35, comprising or consisting of the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- ~~SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
- ~~SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~
- ~~SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~
- ~~SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~
- ~~SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~
- ~~SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~
- ~~SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- ~~SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~

- ~~SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~
- ~~SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~
- ~~SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~
- ~~SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively;~~
- ~~SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively;~~
- ~~SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~
- ~~SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively~~
- ~~SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~
- ~~SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~

- ~~SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
 - ~~SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
 - ~~SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
 - ~~SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
 - ~~SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~
 - ~~SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~
 - ~~SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~
 - ~~SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively;~~
- ~~or~~
- ~~SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively.~~

37. ~~The compound fusion polypeptide of any one of claims 35 to 36, comprising or consisting of the following first fusion polypeptide and second fusion polypeptide in sequential order, from N terminus to C terminus, optionally joined or connected by one or more linkers:~~

- ~~• SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
- ~~• SEQ ID NOs: 71 and 70, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 71 and 70, respectively;~~
- ~~• SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~
- ~~• SEQ ID NOs: 73 and 72, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 73 and 72, respectively;~~
- ~~• SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~
- ~~• SEQ ID NOs: 75 and 74, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 75 and 74, respectively;~~
- ~~• SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~
- ~~• SEQ ID NOs: 77 and 76, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 77 and 76, respectively;~~
- ~~• SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~

- ~~SEQ ID NOs: 79 and 78, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 79 and 78, respectively;~~
- ~~SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~
- ~~SEQ ID NOs: 81 and 80, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 81 and 80, respectively;~~
- ~~SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- ~~SEQ ID NOs: 83 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 82, respectively;~~
- ~~SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 84, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 84, respectively;~~
- ~~SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 86, respectively;~~
- ~~SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~SEQ ID NOs: 89 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 89 and 88, respectively;~~

- ~~SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 82, respectively;~~
- ~~SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~SEQ ID NOs: 86 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 82, respectively;~~
- ~~SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~
- ~~SEQ ID NOs: 88 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 82, respectively;~~
- ~~SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 83, respectively;~~
- ~~SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 85, respectively;~~
- ~~SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively;~~

- ~~SEQ ID NOs: 87 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 88, respectively;~~
- ~~SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 84, respectively;~~
- ~~SEQ ID NOs: 88 and 84, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 84, respectively;~~
- ~~SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~
- ~~SEQ ID NOs: 89 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 89 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively;~~
- ~~SEQ ID NOs: 101 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 85, respectively;~~
- ~~SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~
- ~~SEQ ID NOs: 91 and 90, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 91 and 90, respectively;~~
- ~~SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~

- ~~SEQ ID NOs: 93 and 92, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 93 and 92, respectively;~~
- ~~SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- ~~SEQ ID NOs: 95 and 94, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 94, respectively;~~
- ~~SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- ~~SEQ ID NOs: 97 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 97 and 96, respectively;~~
- ~~SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
- ~~SEQ ID NOs: 96 and 94, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 94, respectively;~~
- ~~SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
- ~~SEQ ID NOs: 97 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 97 and 95, respectively;~~
- ~~SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~
- ~~SEQ ID NOs: 221 and 220, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%,~~

~~96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 221 and 220, respectively;~~

- ~~• SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~
- ~~• SEQ ID NOs: 100 and 98, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 98, respectively;~~
- ~~• SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~
- ~~• SEQ ID NOs: 101 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 99, respectively;~~
- ~~• SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively;~~
- ~~• SEQ ID NOs: 99 and 98, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 98, respectively;~~
- ~~• SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively; or~~
- ~~• SEQ ID NOs: 101 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 100, respectively.~~

38. — The compound fusion polypeptide of any one of claims 35 to 37, wherein the first fusion polypeptide and the second fusion polypeptide are joined or connected by a cleavable linker.

39. — The compound fusion polypeptide of any one of claims 35 to 38, wherein the first fusion polypeptide and the second fusion polypeptide are joined or connected by a cleavable linker selected from a 2A cleavable peptide (*e.g.* foot and mouth disease virus (F2A), equine rhinitis A virus (E2A), porcine teschovirus 1 (P2A) and Thosa asigna virus (T2A)), a furin recognition/cleavage sequence (*e.g.* RAKR (SEQ ID NO: 60), REKR (SEQ ID NO: 61) and RRKR (SEQ ID NO: 62)), and combinations, derivatives or variants thereof.

40. — The compound fusion polypeptide of any one of claims 35 to 39, wherein the first fusion polypeptide and the second fusion polypeptide are joined or connected by a furin recognition/cleavage site selected from RAKR (SEQ ID NO: 60), REKR (SEQ ID NO: 61) and RRKR (SEQ ID NO: 62).

41. — The compound fusion polypeptide of any one of claims 35 to 40, wherein the first fusion polypeptide and the second fusion polypeptide are joined or connected by a 2A cleavable peptide comprising or consisting of the amino acid sequence of ATNFSLLKQAGDVEENPGP (SEQ ID NO: 63), APVKQTLNFDLLKLAGDVESNPGP (SEQ ID NO: 64), RAKRAPVKQTLNFDLLKLAGDVESNPGP (SEQ ID NO: 65), QCTNYALLKLAGDVESNPGP (SEQ ID NO: 66), or EGRGSLTTCGDVEENPGP (SEQ ID NO: 67, or having an amino acid sequence that is at least 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or at least 99% identical to ATNFSLLKQAGDVEENPGP (SEQ ID NO: 63), APVKQTLNFDLLKLAGDVESNPGP (SEQ ID NO: 64), RAKRAPVKQTLNFDLLKLAGDVESNPGP (SEQ ID NO: 65), QCTNYALLKLAGDVESNPGP (SEQ ID NO: 66), or EGRGSLTTCGDVEENPGP (SEQ ID NO: 67).

42. — The compound fusion polypeptide of any one of claims 35 to 41, comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 105-112, 200-209, 222-223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%,

~~84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 105-112, 200-209, 222-223 and 227.~~

~~43. — The compound fusion polypeptide of any one of claims 35 to 42, comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 209, 222, 223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 209, 222, 223 and 227.~~

~~44. — A compound fusion polypeptide comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 105-112, 200-209, 222-223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 105-112, 200-209, 222-223 and 227.~~

~~45. — The compound fusion polypeptide of claim 44, comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 209, 222, 223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 209, 222, 223 and 227.~~

~~46. — The fusion polypeptide of any one of claims 1 to 45 or the compound fusion polypeptide of any one of claims 35 to 44, further comprising an N-terminal signal peptide or leader sequence.~~

~~47. — The fusion polypeptide and the compound fusion polypeptide of claim 46, wherein the signal peptide or leader sequence is from a source protein selected from a serum protein, a cytokine, a chemokine, a chaperone protein, an invariant protein, and a protein that directs proteins to the lysosomal compartment.~~

~~48. — The fusion polypeptide and the compound fusion polypeptide of any one of claims 46 to 47, wherein the signal peptide or leader sequence is from a source protein selected from colony stimulating factor 2 (CSF2, GM-CSF), tissue type plasminogen activator (PLAT, t-PA), C-C motif chemokine ligand 7 (CCL7, MCP-3), C-X-C motif chemokine ligand 10 (CXCL10, IP-10), catenin beta 1 (CTNNB1), CD74 (p33; DHLAG; HLADG; Ia-GAMMA, invariant chain), serum albumin (ALB), polyubiquitin~~

~~B/C (UBB/UBC), calreticulin (CALR), vesicular stomatitis virus G protein (VSV-G), lysosomal associated membrane protein 1 (LAMP-1) and lysosomal associated membrane protein 2 (LAMP-2).~~

~~49. — The fusion polypeptide and the compound fusion polypeptide of any one of claims 46 to 48, wherein the signal peptide or leader sequence is selected from an amino acid sequence of any one of SEQ ID NOs: 115-126, or a nucleic acid sequence that is at least 95%, 96%, 97%, 98%, or 99% identical to any one of SEQ ID NOs: 115-126.~~

~~50. — The fusion polypeptide and the compound fusion polypeptide of any one of claims 46 to 49, wherein the fusion polypeptide and the compound fusion polypeptide are recombinantly produced or chemically synthesized.~~

~~51. — The fusion polypeptide and the compound fusion polypeptide of any one of claims 46 to 50, wherein the fusion polypeptide and the compound fusion polypeptide are capable of inducing, promoting or stimulating an immune response in a human.~~

~~52. — The fusion polypeptide and the compound fusion polypeptide of any one of claims 46 to 51, wherein the fusion polypeptide and the compound fusion polypeptide are capable of inducing, promoting or stimulating an immune response against HIV-1 in a human.~~

~~53. — The fusion polypeptide and the compound fusion polypeptide of any one of claims 46 to 52, wherein fusion polypeptide and the compound fusion polypeptide are capable of inducing, promoting or stimulating proliferation and/or activation of one or more cell types selected from monocyte derived dendritic cells (DCs), CD8+ T cells and CD4+ T cells.~~

~~54. — A polynucleotide comprising a nucleic acid sequence encoding one or more fusion polypeptides or compound fusion polypeptides of any one of claims 1 to 53.~~

~~55. — The polynucleotide of claim 54, wherein the polynucleotide comprises cDNA, mRNA, self-amplifying RNA (SAM, saRNA), self-replicating RNA, or self-amplifying replicon RNA (RepRNA).~~

56. — ~~The polynucleotide of claim 55, wherein the polynucleotide comprises self replicating or self amplifying alphavirus replicons.~~

57. — ~~The polynucleotide of any one of claims 54 to 56, comprising a nucleic acid sequence of any one of SEQ ID NOs: 130 167, 210 219 and 225 226, or that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130 167, 210 219 and 225 226.~~

58. — ~~The polynucleotide of any one of claims 54 to 57, comprising a nucleic acid sequence of any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, 158, 225 and 226, or that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, 158, 225 and 226.~~

59. — ~~A lipoplex, *e.g.*, a lipid nanoparticle (LNP), comprising the polynucleotide of any one of claims 54 to 58.~~

60. — ~~An expression cassette, comprising a polynucleotide of any one of claims 54 to 57 operably linked to one or more regulatory sequences.~~

61. — ~~The expression cassette of claim 60, wherein the polynucleotide is operably linked to and under the control of a constitutive promoter.~~

62. — ~~The expression cassette of any of claims 60 to 61, wherein the promoter is selected from a CMV promoter, a CAG promoter and an EF1a promoter.~~

63. — ~~A vector comprising one or more polynucleotides of any one of claims 54 to 57, or an expression cassette of any one of claims 60 to 62.~~

64. — ~~The vector of claim 63, comprising or consisting of one or more polynucleotides encoding one or more fusion polypeptides comprising the following polypeptide segments comprising in sequential order, from N terminus to C terminus, optionally joined or connected by one or more linkers:~~

- ~~SEQ ID NOs: 6, 4, 16 and 26, and SEQ ID NOs: 7, 5, 27 and 17;~~
- ~~SEQ ID NOs: 12, 24, 8 and 10, and SEQ ID NOs: 9, 25, 13 and 11;~~

- ~~SEQ ID NOs: 14, 22, 18, 24 and 20, and SEQ ID NOs: 15, 25, 19, 23 and 21;~~
- ~~SEQ ID NOs: 26, 16, 4 and 6, and SEQ ID NOs: 7, 27, 5 and 17;~~
- ~~SEQ ID NOs: 8, 24, 12 and 10, and SEQ ID NOs: 13, 25, 9 and 11;~~
- ~~SEQ ID NOs: 22, 24, 14, 18 and 20, and SEQ ID NOs: 25, 23, 15, 21 and 19;~~
- ~~SEQ ID NOs: 20, 6, 4, 18, 16 and 26, and SEQ ID NOs: 7, 19, 5, 21, 27 and 17;~~
- ~~SEQ ID NOs: 8, 24, 14, 12, 22 and 10, and SEQ ID NOs: 9, 13, 25, 23, 15 and 11;~~
- ~~SEQ ID NOs: 18, 26, 20, 4, 6 and 16, and SEQ ID NOs: 7, 21, 17, 5, 27 and 19;~~
- ~~SEQ ID NOs: 22, 24, 12, 14, 8 and 10, and SEQ ID NOs: 15, 25, 9, 23, 13 and 11;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 8, 30, 14, 12, 26 and 10;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 7, 21, 5, 25, 33 and 19;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 8, 30, 14, 12, 26 and 10;~~
- ~~SEQ ID NOs: 8, 30, 14, 12, 26 and 10, and SEQ ID NOs: 9, 13, 31, 27, 15 and 11;~~
- ~~SEQ ID NOs: 6, 20, 4, 24, 32 and 18, and SEQ ID NOs: 8, 12, 30, 26, 14 and 10;~~
- ~~SEQ ID NOs: 7, 21, 5, 25, 33 and 19 and SEQ ID NOs: 9, 13, 31, 27, 15 and 11;~~
- ~~SEQ ID NOs: 20, 32, 24, 4, 6 and 18, and SEQ ID NOs: 26, 30, 12, 14, 8 and 10;~~
- ~~SEQ ID NOs: 7, 25, 19, 5, 33 and 21, and SEQ ID NOs: 15, 31, 9, 27, 13 and 11;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 26, 20, 10 and 28;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 26, 10, 20 and 28;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 7, 25, 17 and 19;~~
- ~~SEQ ID NOs: 7, 19, 17 and 25, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 24, 16, 6 and 18, and SEQ ID NOs: 27, 11, 21 and 29;~~
- ~~SEQ ID NOs: 7, 25, 17 and 19, and SEQ ID NOs: 11, 27, 21 and 29;~~
- ~~SEQ ID NOs: 7, 25, 17 and 19, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 22, 6, 20 and 28, and SEQ ID NOs: 23, 7, 21 and 29;~~
- ~~SEQ ID NOs: 22, 20, 6 and 28, and SEQ ID NOs: 7, 21, 23 and 29;~~
- ~~SEQ ID NOs: 26, 10, 20 and 28, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 22, 6, 16, 20, 18, 28, 26 and 10; or~~
- ~~SEQ ID NOs: 7, 21, 19, 17, 27, 25, 29 and 11.~~

65. ~~The vector of any one of claims 63 to 64, comprising one or more polynucleotides encoding one or more fusion polypeptides comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 70-101, 105-112, 200-209, 222-223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%,~~

~~88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70-101, 105-112, 200-209, 222-223 and 227.~~

~~66. The vector of any one of claims 63 to 65, comprising one or more polynucleotides encoding one or more fusion polypeptides or compound fusion polypeptides comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 82-83, 85-87, 98-101, 209 and 222-223, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82-83, 85-87, 98-101, 209 and 222-223.~~

~~67. The vector of any one of claims 63 to 66, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- ~~• SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
- ~~• SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~
- ~~• SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~
- ~~• SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~
- ~~• SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~
- ~~• SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~

- ~~SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- ~~SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~
- ~~SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~
- ~~SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~
- ~~SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 88, respectively;~~
- ~~SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively;~~

- ~~SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~
- ~~SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively;~~
- ~~SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~
- ~~SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~
- ~~SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- ~~SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- ~~SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
- ~~SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
- ~~SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~
- ~~SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~

- ~~SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~
- ~~SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively;~~
or
- ~~SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively.~~

68. — ~~The vector of any one of claims 63 to 67, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide in sequential order, from N terminus to C terminus, optionally joined or connected by one or more linkers:~~

- ~~SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
- ~~SEQ ID NOs: 71 and 70, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 71 and 70, respectively;~~
- ~~SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~
- ~~SEQ ID NOs: 73 and 72, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 73 and 72, respectively;~~
- ~~SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~

- ~~SEQ ID NOs: 75 and 74, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 75 and 74, respectively;~~
- ~~SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~
- ~~SEQ ID NOs: 77 and 76, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 77 and 76, respectively;~~
- ~~SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~
- ~~SEQ ID NOs: 79 and 78, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 79 and 78, respectively;~~
- ~~SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~
- ~~SEQ ID NOs: 81 and 80, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 81 and 80, respectively;~~
- ~~SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- ~~SEQ ID NOs: 83 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 82, respectively;~~
- ~~SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 84, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 84, respectively;~~

- ~~SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 86, respectively;~~
- ~~SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~SEQ ID NOs: 89 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 89 and 88, respectively;~~
- ~~SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 82, respectively;~~
- ~~SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~SEQ ID NOs: 86 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 82, respectively;~~
- ~~SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~
- ~~SEQ ID NOs: 88 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 82, respectively;~~
- ~~SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~

- ~~SEQ ID NOs: 87 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 83, respectively;~~
- ~~SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 85, respectively;~~
- ~~SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 88, respectively;~~
- ~~SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 84, respectively;~~
- ~~SEQ ID NOs: 88 and 84, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 84, respectively;~~
- ~~SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~
- ~~SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively;~~
- ~~SEQ ID NOs: 89 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 89 and 85, respectively;~~

- ~~SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~
- ~~SEQ ID NOs: 91 and 90, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 91 and 90, respectively;~~
- ~~SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~
- ~~SEQ ID NOs: 93 and 92, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 93 and 92, respectively;~~
- ~~SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- ~~SEQ ID NOs: 95 and 94, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 94, respectively;~~
- ~~SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- ~~SEQ ID NOs: 97 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 97 and 96, respectively;~~
- ~~SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
- ~~SEQ ID NOs: 96 and 94, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 94, respectively;~~
- ~~SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~

- ~~SEQ ID NOs: 97 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 97 and 95, respectively;~~
- ~~SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~
- ~~SEQ ID NOs: 221 and 220, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 221 and 220, respectively;~~
- ~~SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~
- ~~SEQ ID NOs: 100 and 98, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 98, respectively;~~
- ~~SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~
- ~~SEQ ID NOs: 101 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 99, respectively;~~
- ~~SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively;~~
- ~~SEQ ID NOs: 99 and 98, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 98, respectively;~~

- ~~SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively; or~~
- ~~SEQ ID NOs: 101 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 100, respectively.~~

69. ~~The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively.~~

70. ~~The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively.~~

71. ~~The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively.~~

72. ~~The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%,~~

~~88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively.~~

~~73. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively.~~

~~74. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively.~~

~~75. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively.~~

~~76. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively.~~

~~77. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%,~~

~~88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively.~~

~~78. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively.~~

~~79. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively.~~

~~80. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively.~~

~~81. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively.~~

~~82. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%,~~

~~88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively.~~

~~83. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively.~~

~~84. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively.~~

~~85. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively.~~

~~86. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively.~~

~~87. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%,~~

~~88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively.~~

~~88. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively.~~

~~89. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively.~~

~~90. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively.~~

~~91. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.~~

~~92. — The vector of any one of claims 63 to 68, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%,~~

~~88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively.~~

~~93. — The vector of any one of claims 63 to 68, comprising a polynucleotide encoding a compound fusion polypeptide comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 105 112, 200 209, 222 223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 105 112, 200 209, 222 223 and 227.~~

~~94. — The vector of any one of claims 63 to 93, wherein the first and second fusion polypeptides do not comprise any polypeptide segments corresponding to Gag 54 146; Gag 370 500; Pol 1 55; Pol 118 128; Pol 321 366; Pol 432 541; Pol 607 682; Pol 709 746; Pol 828 839; Pol 921 931; Nef 1 63; Nef 100 116 and Nef 149 206, or fragments or subsequences thereof, wherein the Gag, Pol and Nef amino acid position numbers correspond to SEQ ID NOs: 1, 2 and 3, respectively.~~

~~95. — The vector of any one of claims 67 to 94, wherein the first and second fusion polypeptides do not comprise any polypeptide segments having an amino acid sequence of SEQ ID NOs: 35 47, or fragments or subsequences thereof, or an amino acid sequence at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 35 47, or fragments or subsequences thereof.~~

~~96. — The vector of any one of claims 67 to 95, comprising a polynucleotide comprising or consisting of a nucleic acid sequence of any one of SEQ ID NOs: 130 167, 210 219 and 225 226, or a nucleic acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130 167, 210 219 and 225 226.~~

~~97. — The vector of any one of claims 67 to 95, comprising a polynucleotide comprising or consisting of a nucleic acid sequence of any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, 158, 225 and 226, or a nucleic acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, 158, 225 and 226.~~

98. ~~The vector of any one of claims 63 to 97, comprising the following first polynucleotide and second polynucleotide:~~

- ~~SEQ ID NOs: 130 and 132, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130 and 132, respectively;~~
- ~~SEQ ID NOs: 130 and 134, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130 and 134, respectively;~~
- ~~SEQ ID NOs: 131 and 133, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 133, respectively;~~
- ~~SEQ ID NOs: 131 and 135, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 135, respectively;~~
- ~~SEQ ID NOs: 132 and 136, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 132 and 136, respectively;~~
- ~~SEQ ID NOs: 133 and 135, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 135, respectively;~~
- ~~SEQ ID NOs: 133 and 137, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 137, respectively;~~
- ~~SEQ ID NOs: 134 and 136, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 134 and 136, respectively;~~
- ~~SEQ ID NOs: 135 and 137, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 135 and 137, respectively;~~
- ~~SEQ ID NOs: 138 and 141, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 138 and 141, respectively;~~

- ~~SEQ ID NOs: 138 and 144, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 138 and 144, respectively;~~
- ~~SEQ ID NOs: 139 and 142, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 142, respectively;~~
- ~~SEQ ID NOs: 139 and 145, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 145, respectively;~~
- ~~SEQ ID NOs: 140 and 146, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively;~~
- ~~SEQ ID NOs: 142 and 148, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 142 and 148, respectively;~~
- ~~SEQ ID NOs: 143 and 149, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively;~~
- ~~SEQ ID NOs: 145 and 148, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 145 and 148, respectively;~~
- ~~SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively;~~
- ~~SEQ ID NOs: 150 and 155, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 155, respectively;~~
- ~~SEQ ID NOs: 151 and 153, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 151 and 153, respectively;~~
- ~~SEQ ID NOs: 151 and 156, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 151 and 156, respectively;~~

- ~~SEQ ID NOs: 152 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 152 and 158, respectively;~~
- ~~SEQ ID NOs: 153 and 159, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 153 and 159, respectively;~~
- ~~SEQ ID NOs: 154 and 157, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157, respectively;~~
- ~~SEQ ID NOs: 155 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 155 and 158, respectively;~~
- ~~SEQ ID NOs: 156 and 159, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 156 and 159, respectively;~~
- ~~SEQ ID NOs: 160 and 161, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 160 and 161, respectively;~~
- ~~SEQ ID NOs: 162 and 163, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 162 and 163, respectively;~~
- ~~SEQ ID NOs: 164 and 165, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 164 and 165, respectively;~~
- ~~SEQ ID NOs: 166 and 167, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 166 and 167, respectively;~~
- ~~SEQ ID NOs: 210 and 211, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 210 and 211, respectively;~~
- ~~SEQ ID NOs: 212 and 213, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 212 and 213, respectively;~~

- ~~SEQ ID NOs: 214 and 215, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 214 and 215, respectively;~~
- ~~SEQ ID NOs: 216 and 217, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 216 and 217, respectively;~~
- ~~SEQ ID NOs: 218 and 219, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 218 and 219, respectively;~~
- ~~SEQ ID NOs: 218 and 226, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 218 and 226, respectively; or~~
- ~~SEQ ID NOs: 225 and 226, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 225 and 226, respectively.~~

99. ~~The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- a) ~~a first polynucleotide comprising SEQ ID NO: 130 or SEQ ID NO: 131, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 130 or SEQ ID NO: 131, respectively, and~~
- b) ~~a second polynucleotide comprising SEQ ID NO: 134 or SEQ ID NO: 135, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 134 or SEQ ID NO: 135.~~

100. ~~The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- a) ~~a first polynucleotide comprising SEQ ID NO: 132 or SEQ ID NO: 133, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 132 or SEQ ID NO: 133, respectively, and~~

~~b) a second polynucleotide comprising SEQ ID NO: 136 or SEQ ID NO: 137, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 136 or SEQ ID NO: 137.~~

~~101. The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 139, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 139, respectively, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 145, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 145.~~

~~102. The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 142, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 142, respectively, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 148, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 148.~~

~~103. The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 140, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 140, respectively, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 146, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%,~~

~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 146.~~

~~104. — The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 143, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 143, respectively, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 149, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 149.~~

~~105. — The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 150, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 150, respectively, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 152, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 152.~~

~~106. — The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 151, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 151, respectively, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 153, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 153.~~

~~107.—The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 154, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 154, respectively, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 157, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 157.~~

~~108.—The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 155, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 155, respectively, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 158, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 158.~~

~~109.—The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 156, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 156, respectively, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 159, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 159.~~

~~110.—The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- a) ~~a first polynucleotide comprising SEQ ID NO: 160, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 160, respectively, and~~
- b) ~~a second polynucleotide comprising SEQ ID NO: 161, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 161.~~

~~111. — The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- a) ~~a first polynucleotide comprising SEQ ID NO: 162, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 162, respectively, and~~
- b) ~~a second polynucleotide comprising SEQ ID NO: 163, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 163.~~

~~112. — The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- a) ~~a first polynucleotide comprising SEQ ID NO: 164, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 164, respectively, and~~
- b) ~~a second polynucleotide comprising SEQ ID NO: 165, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 165.~~

~~113. — The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- a) ~~a first polynucleotide comprising SEQ ID NO: 166, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%,~~

~~91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 166, respectively, and~~

- ~~b) a second polynucleotide comprising SEQ ID NO: 167, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 167.~~

~~114. The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 210, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 210, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 211, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 211.~~

~~115. The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 212, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 212, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 213, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 213.~~

~~116. The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 214, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 214, and~~

~~b) a second polynucleotide comprising SEQ ID NO: 215, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 215.~~

~~117. The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

~~a) a first polynucleotide comprising SEQ ID NO: 216, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 216, and~~

~~b) a second polynucleotide comprising SEQ ID NO: 217, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 217.~~

~~118. The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

~~a) a first polynucleotide comprising SEQ ID NO: 218, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 218, and~~

~~b) a second polynucleotide comprising SEQ ID NO: 219, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 219.~~

~~119. The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

~~a) a first polynucleotide comprising SEQ ID NO: 218, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 218, and~~

~~b) a second polynucleotide comprising SEQ ID NO: 226, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%,~~

~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 226.~~

~~120. The vector of any one of claims 63 to 98, comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first polynucleotide comprising SEQ ID NO: 225, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 225, and~~
- ~~b) a second polynucleotide comprising SEQ ID NO: 226, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 226.~~

~~121. The vector of any one of claims 63 to 98, comprising SEQ ID NO: 225, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 225.~~

~~122. The vector of any one of claims 63 to 98, comprising SEQ ID NO: 226, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 226.~~

~~123. The vector of any one of claims 67 to 122, wherein the first polynucleotide encoding the first fusion polypeptide and the second polynucleotide encoding the second fusion polypeptide are in a single open reading frame.~~

~~124. The vector of any one of claims 67 to 122, wherein the first polynucleotide encoding the first fusion polypeptide is in a first open reading frame and the second polynucleotide encoding the second fusion polypeptide is in a second open reading frame.~~

~~125. The vector of any one of claims 67 to 122, wherein the first polynucleotide encoding the first fusion polypeptide and the second polynucleotide encoding the second fusion polypeptide are in a single expression cassette.~~

~~126.—The vector of any one of claims 67 to 122, wherein the first polynucleotide encoding the first fusion polypeptide is in a first expression cassette and the second polynucleotide encoding the second fusion polypeptide is in a second expression cassette.~~

~~127.—The vector of any one of claims 63 to 126, wherein the vector is a plasmid vector, a bacterial vector or a viral vector.~~

~~128.—The vector of any one of claims 63 to 127, wherein the vector is a viral vector.~~

~~129.—The vector of any one of claims 63 to 128, wherein the viral vector is a DNA virus or an RNA virus.~~

~~130.—The vector of any one of claims 63 to 129, wherein the viral vector is replication defective, replication deficient, replication attenuated or replication competent.~~

~~131.—The vector of any one of claims 63 to 130, wherein the viral vector is from a virus selected from adenovirus, adeno-associated virus, arenavirus, alphavirus, poxvirus, cytomegalovirus, rhabdovirus, vesicular stomatitis virus, flavivirus, maraba virus and vaccinia virus.~~

~~132.—The vector of any one of claims 63 to 131, wherein the viral vector is from a virus from a taxonomical family selected from Adenoviridae, Arenaviridae, Herpesviridae (*e.g.* Cytomegalovirus), Poxviridae (*e.g.* Vaccinia virus, *e.g.* modified vaccinia Ankara (MVA)), Flaviviridae (*e.g.* Yellow fever virus), Rhabdoviridae (*e.g.* Vesiculovirus, *e.g.* Maraba vesiculovirus), Togaviridae (*e.g.* Alphavirus, *e.g.* Venezuelan equine encephalitis virus).~~

~~133.—The vector of any one of claims 63 to 132, wherein the viral vector is an arenavirus vector selected from Lymphocytic choriomeningitis mammarenavirus (LCMV), Cali mammarenavirus (*a.k.a.*, Pichinde mammarenavirus or Pichinde arenavirus), Guanarito virus (GTOV), Junin virus (JUNV), Lassa virus (LASV), Lujo virus (LUJV), Machupo virus (MACV), Sabia virus (SABV), and Whitewater Arroyo virus (WWAV).~~

~~134.—The vector of claim 133, wherein the viral vector is an arenavirus vector selected from Lymphocytic choriomeningitis-mammarenavirus (LCMV) or Cali mammarenavirus (*a.k.a.* Pichinde mammarenavirus or Pichinde arenavirus).~~

~~135.—The vector of any one of claims 133 to 134, wherein the arenavirus vector comprises a bi-segmented genome.~~

~~136.—The vector of any one of claims 133 to 134, wherein the arenavirus vector comprises a tri-segmented genome.~~

~~137.—The vector of any one of claims 63 to 132, wherein the viral vector is a human adenovirus or a simian adenovirus (*e.g.*, a chimpanzee adenovirus, a gorilla adenovirus or a rhesus adenovirus).~~

~~138.—The vector of claim 137, wherein the viral vector is an adenovirus vector selected from adenovirus serotype 5 (Ad5), adenovirus serotype 26 (Ad26), adenovirus serotype 34 (Ad34), adenovirus serotype 35 (Ad35), adenovirus serotype 48 (Ad48), chimpanzee adenovirus (*e.g.* ChAd3 (AdC3), ChAd5 (AdC5), ChAd6 (AdC6), ChAd7 (AdC7), ChAd8 (AdC8), ChAd9 (AdC9), ChAd10 (AdC10), ChAd11 (AdC11), ChAd17 (AdC17), ChAd16 (AdC16), ChAd19 (AdC19), ChAd20 (AdC20), ChAd22 (AdC22), ChAd24 (AdC24), ChAdY25, ChAd26 (AdC26), ChAd28 (AdC28), ChAd30 (AdC30), ChAd31 (AdC31), ChAd37 (AdC37), ChAd38 (AdC38), ChAd43 (AdC43), ChAd44 (AdC44), ChAd55 (AdC55), ChAd63 (AdC63), ChAdV63, ChAd68 (AdC68), ChAd73 (AdC73), ChAd82 (AdC82), ChAd83 (AdC83), ChAd143 (AdC143), ChAd144 (AdC144), ChAd145 (AdC145), ChAd147 (AdC147)), gorilla adenovirus (*e.g.* GC44, GC45, GC46) and rhesus adenovirus (*e.g.*, RhAd51, RhAd52, RhAd53, RhAd54, RhAd55, RhAd56, RhAd57, RhAd58, RhAd59, RhAd60, RhAd61, RhAd62, RhAd63, RhAd64, RhAd65, RhAd66).~~

~~139.—A host cell comprising one or more polynucleotides of any one of claims 54 to 57, or one or more vectors of any one of claims 63 to 138.~~

~~140.—The host cell of claim 139, wherein the one or more polynucleotides are not integrated into the host cell genome, *e.g.*, are episomal.~~

~~141.—The host cell of claim 139, wherein the one or more polynucleotides are integrated into the host cell genome.~~

~~142.—The host cell of any one of claims 139 to 141, wherein the host cell is a mammalian cell, e.g., a human cell.~~

~~143.—The host cell of any one of claims 139 to 142, wherein the host cell is *in vitro*.~~

~~144.—The host cell of any one of claims 139 to 142, wherein the host cell is *in vivo*.~~

~~145.—An immunogenic composition comprising one or more of the fusion polypeptides or compound fusion polypeptides of any one of claims 1 to 53, or one or more polynucleotides of any one of claims 54 to 57, one or more lipoplexes (e.g., LNPs) of claim 59, or one or more vectors of any one of claims 63 to 130, and a pharmaceutically acceptable carrier.~~

~~146.—The immunogenic composition of claim 145, comprising two or more of the fusion polypeptides of any one of claims 1 to 53, or two or more polynucleotides of any one of claims 54 to 57, two or more lipoplexes (e.g., LNPs) of claim 59, or two or more vectors of any one of claims 63 to 130.~~

~~147.—The immunogenic composition of any one of claims 145 to 146, wherein the one or more polynucleotides are DNA, cDNA, mRNA, or self replicating RNA.~~

~~148.—The immunogenic composition of any one of claims 145 to 147, comprising a first fusion polypeptide and a second fusion polypeptide, or one or more vectors comprising one or more polynucleotides encoding the first and second fusion polypeptides, the first and second polypeptides comprising the following polypeptide segments, in sequential order, from N-terminus to C-terminus, optionally joined or connected by one or more linkers:~~

- ~~• SEQ ID NOs: 6, 4, 16 and 26, and SEQ ID NOs: 7, 5, 27 and 17;~~
- ~~• SEQ ID NOs: 12, 24, 8 and 10, and SEQ ID NOs: 9, 25, 13 and 11;~~
- ~~• SEQ ID NOs: 14, 22, 18, 24 and 20, and SEQ ID NOs: 15, 25, 19, 23 and 21;~~
- ~~• SEQ ID NOs: 26, 16, 4 and 6, and SEQ ID NOs: 7, 27, 5 and 17;~~
- ~~• SEQ ID NOs: 8, 24, 12 and 10, and SEQ ID NOs: 13, 25, 9 and 11;~~
- ~~• SEQ ID NOs: 22, 24, 14, 18 and 20, and SEQ ID NOs: 25, 23, 15, 21 and 19;~~
- ~~• SEQ ID NOs: 20, 6, 4, 18, 16 and 26, and SEQ ID NOs: 7, 19, 5, 21, 27 and 17;~~

- ~~SEQ ID NOs: 8, 24, 14, 12, 22 and 10, and SEQ ID NOs: 9, 13, 25, 23, 15 and 11;~~
- ~~SEQ ID NOs: 18, 26, 20, 4, 6 and 16, and SEQ ID NOs: 7, 21, 17, 5, 27 and 19;~~
- ~~SEQ ID NOs: 22, 24, 12, 14, 8 and 10, and SEQ ID NOs: 15, 25, 9, 23, 13 and 11;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 8, 30, 14, 12, 26 and 10;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 7, 21, 5, 25, 33 and 19;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 8, 30, 14, 12, 26 and 10;~~
- ~~SEQ ID NOs: 8, 30, 14, 12, 26 and 10, and SEQ ID NOs: 9, 13, 31, 27, 15 and 11;~~
- ~~SEQ ID NOs: 6, 20, 4, 24, 32 and 18, and SEQ ID NOs: 8, 12, 30, 26, 14 and 10;~~
- ~~SEQ ID NOs: 7, 21, 5, 25, 33 and 19 and SEQ ID NOs: 9, 13, 31, 27, 15 and 11;~~
- ~~SEQ ID NOs: 20, 32, 24, 4, 6 and 18, and SEQ ID NOs: 26, 30, 12, 14, 8 and 10;~~
- ~~SEQ ID NOs: 7, 25, 19, 5, 33 and 21, and SEQ ID NOs: 15, 31, 9, 27, 13 and 11;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 26, 20, 10 and 28;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 26, 10, 20 and 28;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 7, 25, 17 and 19;~~
- ~~SEQ ID NOs: 7, 19, 17 and 25, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 24, 16, 6 and 18, and SEQ ID NOs: 27, 11, 21 and 29;~~
- ~~SEQ ID NOs: 7, 25, 17 and 19, and SEQ ID NOs: 11, 27, 21 and 29;~~
- ~~SEQ ID NOs: 7, 25, 17 and 19, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 22, 6, 20 and 28, and SEQ ID NOs: 23, 7, 21 and 29;~~
- ~~SEQ ID NOs: 22, 20, 6 and 28, and SEQ ID NOs: 7, 21, 23 and 29;~~
- ~~SEQ ID NOs: 26, 10, 20 and 28, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 22, 6, 16, 20, 18, 28, 26 and 10; or~~
- ~~SEQ ID NOs: 7, 21, 19, 17, 27, 25, 29 and 11.~~

~~149. The immunogenic composition of any one of claims 145 to 148, comprising one or more fusion polypeptides, or one or more vectors comprising one or more polynucleotides encoding one or more fusion polypeptides, comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 70 101, 105 112, 200 209, 222 223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 101, 105 112, 200 209, 222 223 and 227.~~

~~150. The immunogenic composition of any one of claims 145 to 149, comprising one or more fusion polypeptides, or one or more vectors comprising one or~~

~~more polynucleotides encoding one or more fusion polypeptides, comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 82-83, 85-87, 98-101, 209, 222-223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82-83, 85-87, 98-101, 209, 222-223 and 227.~~

~~151. The immunogenic composition of any one of claims 145 to 150, comprising the following first fusion polypeptide and second fusion polypeptide, one or more polynucleotides, or one or more vectors or one or more lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- ~~• SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
- ~~• SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~
- ~~• SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~
- ~~• SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~
- ~~• SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~
- ~~• SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~
- ~~• SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~

- ~~SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~
- ~~SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~
- ~~SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~
- ~~SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~
- ~~SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively;~~
- ~~SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively;~~
- ~~SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~

- ~~SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively;~~
- ~~SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~
- ~~SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~
- ~~SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- ~~SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- ~~SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
- ~~SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
- ~~SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~
- ~~SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~
- ~~SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%,~~

~~96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~

- ~~• SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively;~~
- ~~or~~
- ~~• SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively.~~

~~152. The immunogenic composition of any one of claims 145 to 151, comprising the following first fusion polypeptide and second fusion polypeptide, one or more polynucleotides, or one or more vectors or one or more lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, in sequential order, from N terminus to C terminus, optionally joined or connected by one or more linkers:~~

- ~~• SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
- ~~• SEQ ID NOs: 71 and 70, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 71 and 70, respectively;~~
- ~~• SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~
- ~~• SEQ ID NOs: 73 and 72, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 73 and 72, respectively;~~
- ~~• SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~

- ~~SEQ ID NOs: 75 and 74, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 75 and 74, respectively;~~
- ~~SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~
- ~~SEQ ID NOs: 77 and 76, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 77 and 76, respectively;~~
- ~~SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~
- ~~SEQ ID NOs: 79 and 78, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 79 and 78, respectively;~~
- ~~SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~
- ~~SEQ ID NOs: 81 and 80, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 81 and 80, respectively;~~
- ~~SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- ~~SEQ ID NOs: 83 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 82, respectively;~~
- ~~SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 84, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 84, respectively;~~

- ~~SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 86, respectively;~~
- ~~SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~SEQ ID NOs: 89 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 89 and 88, respectively;~~
- ~~SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 82, respectively;~~
- ~~SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~SEQ ID NOs: 86 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 82, respectively;~~
- ~~SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~
- ~~SEQ ID NOs: 88 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 82, respectively;~~
- ~~SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~

- ~~SEQ ID NOs: 87 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 83, respectively;~~
- ~~SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 85, respectively;~~
- ~~SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 88, respectively;~~
- ~~SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 84, respectively;~~
- ~~SEQ ID NOs: 88 and 84, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 84, respectively;~~
- ~~SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~
- ~~SEQ ID NOs: 89 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 89 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively;~~
- ~~SEQ ID NOs: 101 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%,~~

~~96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 85, respectively;~~

- ~~• SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~
- ~~• SEQ ID NOs: 91 and 90, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 91 and 90, respectively;~~
- ~~• SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~
- ~~• SEQ ID NOs: 93 and 92, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 93 and 92, respectively;~~
- ~~• SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- ~~• SEQ ID NOs: 95 and 94, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 94, respectively;~~
- ~~• SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- ~~• SEQ ID NOs: 97 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 97 and 96, respectively;~~
- ~~• SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
- ~~• SEQ ID NOs: 96 and 94, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 94, respectively;~~

- ~~SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
- ~~SEQ ID NOs: 97 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 97 and 95, respectively;~~
- ~~SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~
- ~~SEQ ID NOs: 221 and 220, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 221 and 220, respectively;~~
- ~~SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~
- ~~SEQ ID NOs: 100 and 98, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 98, respectively;~~
- ~~SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~
- ~~SEQ ID NOs: 101 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 99, respectively;~~
- ~~SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively;~~

- ~~SEQ ID NOs: 99 and 98, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 98, respectively;~~
- ~~SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively; or~~
- ~~SEQ ID NOs: 101 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 100, respectively.~~

~~153.—The immunogenic composition of any one of claims 145 to 152, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a)——a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively, and~~

~~b)——a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively.~~

~~154.—The immunogenic composition of any one of claims 145 to 152, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) ~~— a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively, and~~

b) ~~— a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively.~~

155. ~~— The immunogenic composition of any one of claims 145 to 152, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) ~~— a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively, and~~

b) ~~— a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively.~~

156. ~~— The immunogenic composition of any one of claims 145 to 152, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) ~~— a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively, and~~

b) ~~— a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively.~~

157. ~~— The immunogenic composition of any one of claims 145 to 152, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) ~~— a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively, and~~

b) ~~— a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively.~~

158. ~~— The immunogenic composition of any one of claims 145 to 152, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) ~~— a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively, and~~

b) ~~— a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively.~~

159. ~~— The immunogenic composition of any one of claims 145 to 152, comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers, SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively.~~

160. ~~— The immunogenic composition of any one of claims 145 to 152, comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers, SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively.~~

161. ~~— The immunogenic composition of any one of claims 145 to 152, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) ~~— a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second~~

fusion polypeptide comprising SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively, and

b)——a second polynucleotide or second viral vector or second lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively.

162.——The immunogenic composition of any one of claims 145 to 152, comprising first and second viral vectors or first and second lipoplexes (*e.g.*, LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:

a)——a first polynucleotide or first viral vector or first lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively, and

b)——a second polynucleotide or second viral vector or second lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively.

163.——The immunogenic composition of any one of claims 145 to 152, comprising first and second viral vectors or first and second lipoplexes (*e.g.*, LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:

a)——a first polynucleotide or first viral vector or first lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 220 and 221, or fusion polypeptides that are at

least ~~80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99%~~ identical to any one of SEQ ID NOs: 220 and 221, respectively, and

b) ~~— a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively.~~

~~164. The immunogenic composition of any one of claims 145 to 152, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) ~~— a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively, and~~

b) ~~— a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.~~

~~165. The immunogenic composition of any one of claims 145 to 152, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) ~~— a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%,~~

~~95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively, and~~

~~b) — a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively.~~

~~166. — The immunogenic composition of any one of claims 145 to 152, comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively.~~

~~167. — The immunogenic composition of any one of claims 145 to 152, comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively.~~

~~168. — The immunogenic composition of any one of claims 145 to 152, comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively.~~

~~169. — The immunogenic composition of any one of claims 145 to 152, comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides~~

~~encoding a first fusion polypeptide and a second fusion polypeptide, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 87 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 88, respectively.~~

~~170.—The immunogenic composition of any one of claims 145 to 152, comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively.~~

~~171.—The immunogenic composition of any one of claims 145 to 152, comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively.~~

~~172.—The immunogenic composition of any one of claims 145 to 152, comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively.~~

~~173.—The immunogenic composition of any one of claims 145 to 152, comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%,~~

~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively.~~

~~174. — The immunogenic composition of any one of claims 145 to 152, comprising a first viral vector or a lipoplex (e.g., LNP) comprising a first polynucleotide encoding a first polypeptide comprising SEQ ID NO: 200, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 200, and a second viral vector or a lipoplex (e.g., LNP) comprising a second polynucleotide encoding a second polypeptide comprising SEQ ID NO: 201, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 201.~~

~~175. — The immunogenic composition of any one of claims 145 to 152, comprising a first viral vector or a lipoplex (e.g., LNP) comprising a first polynucleotide encoding a first polypeptide comprising SEQ ID NO: 202, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 202, and a second viral vector or a lipoplex (e.g., LNP) comprising a second polynucleotide encoding a second polypeptide comprising SEQ ID NO: 203, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 203.~~

~~176. — The immunogenic composition of any one of claims 145 to 152, comprising a first viral vector or a lipoplex (e.g., LNP) comprising a first polynucleotide encoding a first polypeptide comprising SEQ ID NO: 204, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 204, and a second viral vector or a lipoplex (e.g., LNP) comprising a second polynucleotide encoding a second polypeptide comprising SEQ ID NO: 205, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 205.~~

~~177. — The immunogenic composition of any one of claims 145 to 152, comprising a first viral vector or a lipoplex (e.g., LNP) comprising a first polynucleotide~~

encoding a first polypeptide comprising SEQ ID NO: 105, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 105, and a second viral vector or a lipoplex (e.g., LNP) comprising a second polynucleotide encoding a second polypeptide comprising SEQ ID NO: 107, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 107.

178.— The immunogenic composition of any one of claims 145 to 152, comprising a first viral vector or a lipoplex (e.g., LNP) comprising a first polynucleotide encoding a first polypeptide comprising SEQ ID NO: 206, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 206, and a second viral vector or a lipoplex (e.g., LNP) comprising a second polynucleotide encoding a second polypeptide comprising SEQ ID NO: 207, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 207.

179.— The immunogenic composition of any one of claims 145 to 152, comprising a first viral vector or a lipoplex (e.g., LNP) comprising a first polynucleotide encoding a first polypeptide comprising SEQ ID NO: 208, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 208, and a second viral vector or a lipoplex (e.g., LNP) comprising a second polynucleotide encoding a second polypeptide comprising SEQ ID NO: 209 or SEQ ID NO: 227, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 209 or SEQ ID NO: 227.

180.— The immunogenic composition of any one of claims 145 to 152, comprising a first viral vector or a lipoplex (e.g., LNP) comprising a first polynucleotide encoding a first polypeptide comprising SEQ ID NO: 222, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222, and a second viral vector or a lipoplex (e.g., LNP) comprising a second polynucleotide encoding a second polypeptide comprising SEQ ID NO: 209 or SEQ ID NO: 227, or a polypeptide that is at least 80%,

~~81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 209 or SEQ ID NO: 227.~~

~~181. The immunogenic composition of any one of claims 145 to 152, comprising a first viral vector or a lipoplex (e.g., LNP) comprising a first polynucleotide encoding a first polypeptide comprising SEQ ID NO: 222, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222, and a second viral vector or a lipoplex (e.g., LNP) comprising a second polynucleotide encoding a second polypeptide comprising SEQ ID NO: 223, or a polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 223.~~

~~182. The immunogenic composition of any one of claims 145 to 181, wherein the first and second viral vectors are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.~~

~~183. The immunogenic composition of any one of claims 145 to 181, wherein the first and second viral vectors are Cali mammarenavirus (a.k.a. Pichinde mammarenavirus or Pichinde arenavirus) viral vectors.~~

~~184. The immunogenic composition of any one of claims 145 to 181, wherein the first and second viral vectors are adenoviral vectors, e.g., chimpanzee adenoviral vectors (ChAds).~~

~~185. The immunogenic composition of any one of claims 145 to 184, comprising a polynucleotide comprising or consisting of a nucleic acid sequence of any one of SEQ ID NOs: 130-167, 210-219 and 225-226, or a nucleic acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130-167, 210-219 and 225-226.~~

~~186. The immunogenic composition of any one of claims 145 to 184, comprising a polynucleotide comprising or consisting of a nucleic acid sequence of any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, 158, 225 and 226, or a nucleic acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%,~~

~~88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, 158, 225 and 226.~~

~~187. The immunogenic composition of any one of claims 145 to 186, comprising the following first polynucleotide and second polynucleotide, or one or more vectors comprising the following first polynucleotide and second polynucleotide:~~

- ~~• SEQ ID NOs: 130 and 132, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130 and 132, respectively;~~
- ~~• SEQ ID NOs: 130 and 134, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130 and 134, respectively;~~
- ~~• SEQ ID NOs: 131 and 133, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 133, respectively;~~
- ~~• SEQ ID NOs: 131 and 135, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 135, respectively;~~
- ~~• SEQ ID NOs: 132 and 136, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 132 and 136, respectively;~~
- ~~• SEQ ID NOs: 133 and 135, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 135, respectively;~~
- ~~• SEQ ID NOs: 133 and 137, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 137, respectively;~~
- ~~• SEQ ID NOs: 134 and 136, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 134 and 136, respectively;~~
- ~~• SEQ ID NOs: 135 and 137, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 135 and 137, respectively;~~

- ~~SEQ ID NOs: 138 and 141, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 138 and 141, respectively;~~
- ~~SEQ ID NOs: 138 and 144, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 138 and 144, respectively;~~
- ~~SEQ ID NOs: 139 and 142, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 142, respectively;~~
- ~~SEQ ID NOs: 139 and 145, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 145, respectively;~~
- ~~SEQ ID NOs: 140 and 146, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively;~~
- ~~SEQ ID NOs: 142 and 148, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 142 and 148, respectively;~~
- ~~SEQ ID NOs: 143 and 149, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively;~~
- ~~SEQ ID NOs: 145 and 148, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 145 and 148, respectively;~~
- ~~SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively;~~
- ~~SEQ ID NOs: 150 and 155, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 155, respectively;~~
- ~~SEQ ID NOs: 151 and 153, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 151 and 153, respectively;~~

- ~~SEQ ID NOs: 151 and 156, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 151 and 156, respectively;~~
- ~~SEQ ID NOs: 152 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 152 and 158, respectively;~~
- ~~SEQ ID NOs: 153 and 159, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 153 and 159, respectively;~~
- ~~SEQ ID NOs: 154 and 157, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157, respectively;~~
- ~~SEQ ID NOs: 155 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 155 and 158, respectively;~~
- ~~SEQ ID NOs: 156 and 159, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 156 and 159, respectively;~~
- ~~SEQ ID NOs: 160 and 161, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 160 and 161, respectively;~~
- ~~SEQ ID NOs: 162 and 163, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 162 and 163, respectively;~~
- ~~SEQ ID NOs: 164 and 165, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 164 and 165, respectively;~~
- ~~SEQ ID NOs: 166 and 167, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 166 and 167, respectively;~~
- ~~SEQ ID NOs: 210 and 211, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 210 and 211, respectively;~~

- ~~SEQ ID NOs: 212 and 213, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 212 and 213, respectively;~~
- ~~SEQ ID NOs: 214 and 215, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 214 and 215, respectively;~~
- ~~SEQ ID NOs: 216 and 217, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 216 and 217, respectively;~~
- ~~SEQ ID NOs: 218 and 219, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 218 and 219, respectively;~~
- ~~SEQ ID NOs: 218 and 226, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 218 and 226, respectively; or~~
- ~~SEQ ID NOs: 225 and 226, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 225 and 226, respectively.~~

~~188. The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising the following first polynucleotide and second polynucleotide:~~

~~a) — a first vector or first lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 131 and 135, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 135, respectively, and~~

~~b) — a second vector or second lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 133 and 137, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 137, respectively.~~

~~189.—The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising the following first polynucleotide and second polynucleotide:~~

~~a)——a first vector or first lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 139 and 145, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 145, respectively, and~~

~~b)——a second vector or second lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 142 and 148, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 142 and 148, respectively.~~

~~190.—The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising the following first polynucleotide and second polynucleotide:~~

~~a)——a first vector or first lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 140 and 146, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively, and~~

~~b)——a second vector or second lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 143 and 149, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively.~~

~~191.—The immunogenic composition of claim 190, wherein the first and second viral vectors are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.~~

~~192.—The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising the following first polynucleotide and second polynucleotide:~~

a)——a first vector or first lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively, and

b)——a second vector or second lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, respectively.

193.——The immunogenic composition of claim 192, wherein the first and second viral vectors are Cali mammarenavirus (*a.k.a.* Pichinde mammarenavirus or Pichinde arenavirus) viral vectors.

194.——The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (*e.g.*, LNPs) comprising the following first polynucleotide and second polynucleotide:

a)——a first vector or first lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 151 and 153, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 151 and 153, respectively, and

b)——a second vector or second lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 156 and 159, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 156 and 159, respectively.

195.——The immunogenic composition of any one of claims 192 and 194, wherein the first and second viral vectors are adenoviral vectors.

196.——The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (*e.g.*, LNPs) comprising one or more polynucleotides:

a)——the first viral vector or first lipoplex (*e.g.*, LNP) comprising a polynucleotide of SEQ ID NO: 160, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 160, and

b)——the second viral vector or second lipoplex (*e.g.*, LNP) comprising a polynucleotide of SEQ ID NO: 161, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 161.

197.——The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (*e.g.*, LNPs) comprising one or more polynucleotides:

a)——the first viral vector or first lipoplex (*e.g.*, LNP) comprising a polynucleotide of SEQ ID NO: 162, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 162, and

b)——the second viral vector or second lipoplex (*e.g.*, LNP) comprising a polynucleotide of SEQ ID NO: 163, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 163.

198.——The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (*e.g.*, LNPs) comprising one or more polynucleotides:

a)——the first viral vector or first lipoplex (*e.g.*, LNP) comprising a polynucleotide of SEQ ID NO: 164, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 164, and

b)——the second viral vector or second lipoplex (*e.g.*, LNP) comprising a polynucleotide of SEQ ID NO: 165, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 165.

~~199.—The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides:~~

~~a)——the first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 166, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 166, and~~

~~b)——the second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 167, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 167.~~

~~200.—The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides:~~

~~a)——the first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 210, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 210, and~~

~~b)——the second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 211, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 211.~~

~~201.—The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides:~~

~~a)——the first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 212, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 212, and~~

~~b)——the second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 213, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 213.~~

~~202.—The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides:~~

~~a)——the first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 214, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 214, and~~

~~b)——the second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 215, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 215.~~

~~203.—The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides:~~

~~a)——the first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 216, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 216, and~~

~~b)——the second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 217, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 217.~~

~~204.—The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides:~~

~~a)——the first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 218, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 218, and~~

~~b)——the second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 219, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 219.~~

~~205.—The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides:~~

~~a)——the first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 218, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 218, and~~

~~b)——the second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 226, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 226.~~

~~206.—The immunogenic composition of any one of claims 145 to 187, comprising first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides:~~

~~a)——the first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 225, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 225, and~~

~~b)——the second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide of SEQ ID NO: 226, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 226.~~

~~207.—The immunogenic composition of any one of claims 145 to 206, comprising a compound fusion polypeptide, a vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide, the compound fusion polypeptide comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 105-112, 200-209, 222-223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 105-112, 200-209, 222-223 and 227.~~

~~208.—The immunogenic composition of any one of claims 145 to 207, comprising a compound fusion polypeptide, a vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide, the compound fusion polypeptide~~

comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 209, 222, 223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 209, 222, 223 and 227.

209. — The immunogenic composition of any one of claims 145 to 208, wherein the one or more fusion polypeptides do not comprise any polypeptide segments corresponding to Gag 54-146; Gag 370-500; Pol 1-55; Pol 118-128; Pol 321-366; Pol 432-541; Pol 607-682; Pol 709-746; Pol 828-839; Pol 921-931; Nef 1-63; Nef 100-116 and Nef 149-206, or fragments or subsequences thereof, wherein the Gag, Pol and Nef amino acid position numbers correspond to SEQ ID NOs: 1, 2 and 3, respectively.

210. — The immunogenic composition of any one of claims 145 to 209, wherein the one or more fusion polypeptides do not comprise any polypeptide segments having an amino acid sequence of SEQ ID NOs: 35-47, or fragments or subsequences thereof, or an amino acid sequence at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 35-47, or fragments or subsequences thereof.

211. — The immunogenic composition of any one of claims 145 to 210, comprising a single vector comprising one or more polynucleotides encoding first and second fusion polypeptides.

212. — The immunogenic composition of any one of claims 145 to 211, further comprising one or more of an adjuvant, a detergent, a micelle forming agent, and an oil.

213. — The immunogenic composition of any one of claims 145 to 212, formulated for administration via a route selected from intravenous, intramuscular, intradermal, subcutaneous, intranodal and mucosal (e.g. buccal, intranasal, intrarectal, intravaginal).

214. — The immunogenic composition of any one of claims 145 to 213, formulated as a liquid, a suspension or an emulsion.

215. — The immunogenic composition of any one of claims 145 to 213, wherein the composition is lyophilized.

216.— ~~A kit comprising one or more unitary doses of one or more of the fusion polypeptides of any one of claims 1 to 53, or one or more polynucleotides of any one of claims 54 to 57, or one or more vectors of any one of claims 63 to 130, or one or more immunogenic compositions of any one of claims 145 to 215.~~

217.— ~~The kit of claim 216, wherein the one or more unitary doses are in a single container.~~

218.— ~~The kit of claim 216, wherein the one or more unitary doses are in two or more separate containers.~~

219.— ~~The kit of any one of claims 216 to 218, comprising one or more containers selected from vials, ampules and pre-loaded syringes.~~

220.— ~~The kit of any one of claims 216 to 219, comprising one or more containers comprising the one or more fusion polypeptides, one or more polynucleotides or one or more vectors in an aqueous solution.~~

221.— ~~The kit of any one of claims 216 to 220, wherein the one or more unitary doses are the same.~~

222.— ~~The kit of any one of claims 216 to 220, wherein the one or more unitary doses are the different.~~

223.— ~~The kit of any one of claims 216 to 222, comprising one or more unitary doses of one or more viral vectors of any one of claims 63 to 130, wherein the unitary doses are in the range of about 10^3 to about 10^{12} viral focus forming units (FFU) or plaque forming units (PFU) or infectious units (IU) or viral particles (vp), e.g. from about 10^4 to about 10^7 viral FFU or PFU or IU or vp, e.g. from about 10^3 to about 10^4 , 10^5 , 10^6 , 10^7 , 10^8 , 10^9 , 10^{10} , 10^{11} , 10^{12} , 10^{13} , 10^{14} or 10^{15} viral FFU or PFU or IU or vp.~~

224.— ~~The kit of any one of claims 216 to 223, comprising two or more of the fusion polypeptides of any one of claims 1 to 53, or two or more polynucleotides of any one of claims 54 to 57, or two or more vectors of any one of claims 63 to 130.~~

225.— ~~The kit of any one of claims 216 to 224, comprising a first fusion polypeptide and a second fusion polypeptide, or one or more vectors comprising one or more polynucleotides encoding the first and second fusion polypeptides, the first and second~~

polypeptides comprising the following polypeptide segments, in sequential order, from N-terminus to C terminus, optionally joined or connected by one or more linkers:

- ~~SEQ ID NOs: 6, 4, 16 and 26, and SEQ ID NOs: 7, 5, 27 and 17;~~
- ~~SEQ ID NOs: 12, 24, 8 and 10, and SEQ ID NOs: 9, 25, 13 and 11;~~
- ~~SEQ ID NOs: 14, 22, 18, 24 and 20, and SEQ ID NOs: 15, 25, 19, 23 and 21;~~
- ~~SEQ ID NOs: 26, 16, 4 and 6, and SEQ ID NOs: 7, 27, 5 and 17;~~
- ~~SEQ ID NOs: 8, 24, 12 and 10, and SEQ ID NOs: 13, 25, 9 and 11;~~
- ~~SEQ ID NOs: 22, 24, 14, 18 and 20, and SEQ ID NOs: 25, 23, 15, 21 and 19;~~
- ~~SEQ ID NOs: 20, 6, 4, 18, 16 and 26, and SEQ ID NOs: 7, 19, 5, 21, 27 and 17;~~
- ~~SEQ ID NOs: 8, 24, 14, 12, 22 and 10, and SEQ ID NOs: 9, 13, 25, 23, 15 and 11;~~
- ~~SEQ ID NOs: 18, 26, 20, 4, 6 and 16, and SEQ ID NOs: 7, 21, 17, 5, 27 and 19;~~
- ~~SEQ ID NOs: 22, 24, 12, 14, 8 and 10, and SEQ ID NOs: 15, 25, 9, 23, 13 and 11;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 8, 30, 14, 12, 26 and 10;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 7, 21, 5, 25, 33 and 19;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 8, 30, 14, 12, 26 and 10;~~
- ~~SEQ ID NOs: 8, 30, 14, 12, 26 and 10, and SEQ ID NOs: 9, 13, 31, 27, 15 and 11;~~
- ~~SEQ ID NOs: 6, 20, 4, 24, 32 and 18, and SEQ ID NOs: 8, 12, 30, 26, 14 and 10;~~
- ~~SEQ ID NOs: 7, 21, 5, 25, 33 and 19 and SEQ ID NOs: 9, 13, 31, 27, 15 and 11;~~
- ~~SEQ ID NOs: 20, 32, 24, 4, 6 and 18, and SEQ ID NOs: 26, 30, 12, 14, 8 and 10;~~
- ~~SEQ ID NOs: 7, 25, 19, 5, 33 and 21, and SEQ ID NOs: 15, 31, 9, 27, 13 and 11;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 26, 20, 10 and 28;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 26, 10, 20 and 28;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 7, 25, 17 and 19;~~
- ~~SEQ ID NOs: 7, 19, 17 and 25, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 24, 16, 6 and 18, and SEQ ID NOs: 27, 11, 21 and 29;~~
- ~~SEQ ID NOs: 7, 25, 17 and 19, and SEQ ID NOs: 11, 27, 21 and 29;~~
- ~~SEQ ID NOs: 7, 25, 17 and 19, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 22, 6, 20 and 28, and SEQ ID NOs: 23, 7, 21 and 29;~~
- ~~SEQ ID NOs: 22, 20, 6 and 28, and SEQ ID NOs: 7, 21, 23 and 29;~~
- ~~SEQ ID NOs: 26, 10, 20 and 28, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 22, 6, 16, 20, 18, 28, 26 and 10; or~~
- ~~SEQ ID NOs: 7, 21, 19, 17, 27, 25, 29 and 11.~~

~~226. The kit of any one of claims 216 to 225, comprising one or more fusion polypeptides, one or more vectors, or one or more lipoplexes (LNPs), comprising one or more polynucleotides encoding one or more fusion polypeptides, comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 70-101, 105-112, 200-209, 222-223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70-101, 105-112, 200-209, 222-223 and 227.~~

~~227. The kit of any one of claims 216 to 226, comprising one or more fusion polypeptides, one or more vectors, or one or more lipoplexes (LNPs), comprising one or more polynucleotides encoding one or more fusion polypeptides, comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 82-83, 85-87, 98-101, 209, 222-223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82-83, 85-87, 98-101, 209, 222-223 and 227.~~

~~228. The kit of any one of claims 216 to 227, comprising the following first fusion polypeptide and second fusion polypeptide, or one or more vectors comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- ~~• SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
- ~~• SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~
- ~~• SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~
- ~~• SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~

- ~~SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~
- ~~SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~
- ~~SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- ~~SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~
- ~~SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~
- ~~SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~
- ~~SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~

- ~~SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively;~~
- ~~SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively;~~
- ~~SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~
- ~~SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively;~~
- ~~SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~
- ~~SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~
- ~~SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- ~~SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- ~~SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
- ~~SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
- ~~SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%,~~

~~96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~

- ~~• SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~
 - ~~• SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~
 - ~~• SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively;~~
- ~~or~~
- ~~• SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively.~~

~~229. The kit of any one of claims 216 to 228, comprising the following first fusion polypeptide and second fusion polypeptide, one or more vectors, or one or more lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, in sequential order, from N-terminus to C terminus, optionally joined or connected by one or more linkers:~~

- ~~• SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
- ~~• SEQ ID NOs: 71 and 70, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 71 and 70, respectively;~~
- ~~• SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~

- ~~SEQ ID NOs: 73 and 72, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 73 and 72, respectively;~~
- ~~SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~
- ~~SEQ ID NOs: 75 and 74, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 75 and 74, respectively;~~
- ~~SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~
- ~~SEQ ID NOs: 77 and 76, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 77 and 76, respectively;~~
- ~~SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~
- ~~SEQ ID NOs: 79 and 78, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 79 and 78, respectively;~~
- ~~SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~
- ~~SEQ ID NOs: 81 and 80, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 81 and 80, respectively;~~
- ~~SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- ~~SEQ ID NOs: 83 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 82, respectively;~~

- ~~SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 84, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 84, respectively;~~
- ~~SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 86, respectively;~~
- ~~SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~SEQ ID NOs: 89 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 89 and 88, respectively;~~
- ~~SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 82, respectively;~~
- ~~SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~SEQ ID NOs: 86 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 82, respectively;~~
- ~~SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~

- ~~SEQ ID NOs: 88 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 82, respectively;~~
- ~~SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 83, respectively;~~
- ~~SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 85, respectively;~~
- ~~SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 88, respectively;~~
- ~~SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 84, respectively;~~
- ~~SEQ ID NOs: 88 and 84, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 84, respectively;~~
- ~~SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~
- ~~SEQ ID NOs: 89 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 89 and 85, respectively;~~

- ~~SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively;~~
- ~~SEQ ID NOs: 101 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 85, respectively;~~
- ~~SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~
- ~~SEQ ID NOs: 91 and 90, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 91 and 90, respectively;~~
- ~~SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~
- ~~SEQ ID NOs: 93 and 92, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 93 and 92, respectively;~~
- ~~SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- ~~SEQ ID NOs: 95 and 94, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 94, respectively;~~
- ~~SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- ~~SEQ ID NOs: 97 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 97 and 96, respectively;~~

- ~~SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
- ~~SEQ ID NOs: 96 and 94, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 94, respectively;~~
- ~~SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
- ~~SEQ ID NOs: 97 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 97 and 95, respectively;~~
- ~~SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~
- ~~SEQ ID NOs: 221 and 220, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 221 and 220, respectively;~~
- ~~SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~
- ~~SEQ ID NOs: 100 and 98, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 98, respectively;~~
- ~~SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~

- ~~SEQ ID NOs: 101 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 99, respectively;~~
- ~~SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively;~~
- ~~SEQ ID NOs: 99 and 98, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 98, respectively;~~
- ~~SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively; or~~
- ~~SEQ ID NOs: 101 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 100, respectively.~~

~~230.—The kit of any one of claims 216 to 229, comprising first, second, third and fourth viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%,~~

~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~

- ~~e) a third viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively; and~~
- ~~d) a fourth viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively.~~

~~231. The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively, and~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively.~~

~~232. The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding~~

the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively, and~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively.~~

233. ~~The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively, and~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively.~~

234. ~~The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 200, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 200, and~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 201, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 201.~~

235. ~~The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 202, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 202, and~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 203, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 203.~~

236. ~~The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 204, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 204, and~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 205, or fusion~~

polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 205.

~~237. The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 105 or 206, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 105 or 206, respectively, and~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 107 or 207, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 107 or 207, respectively.~~

~~238. The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 208, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 208, and~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 209 or SEQ ID NO: 227, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 209 or SEQ ID NO: 227.~~

~~239. The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 222, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222, and~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 209 or SEQ ID NO: 227, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 209 or SEQ ID NO: 227.~~

~~240. The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 222, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222, and~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a fusion polypeptide comprising SEQ ID NO: 223, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 223.~~

~~241. The kit of any one of claims 216 to 229, comprising first, second, third and fourth viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion~~

polypeptide comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;

b) a second viral vector or lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;

c) a third viral vector or lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively; and

d) a fourth viral vector or lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively.

242. The kit of any one of claims 216 to 229, comprising first, second, third and fourth viral vectors or lipoplexes (*e.g.*, LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:

a) a first viral vector or lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;

- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~
- ~~c) a third viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively; and~~
- ~~d) a fourth viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.~~

243. — The kit of any one of claims 216 to 229, comprising first, second, third and fourth viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%,~~

~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~

- ~~e) a third viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively; and~~
- ~~d) a fourth viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively.~~

~~244. The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively, and~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively.~~

~~245. The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding~~

the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively, and~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively.~~

246. ~~The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively, and~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively.~~

247. ~~The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding~~

~~the following first compound fusion polypeptide and second compound fusion polypeptide, respectively:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a first compound fusion polypeptide comprising an amino acid sequence of SEQ ID NO: 222, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222, and~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a second compound fusion polypeptide comprising an amino acid sequence of SEQ ID NO: 209 or SEQ ID NO: 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 209 or SEQ ID NO: 227, respectively.~~

~~248. The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first compound fusion polypeptide and second compound fusion polypeptide, respectively:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a first compound fusion polypeptide comprising an amino acid sequence of SEQ ID NO: 222, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222, and~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising a polynucleotide encoding a second compound fusion polypeptide comprising an amino acid sequence of SEQ ID NO: 223, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 223, respectively.~~

~~249. The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding~~

the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively, and~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively.~~

250. ~~The kit of any one of claims 216 to 229, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively, and~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.~~

251. ~~The kit of any one of claims 216 to 229, comprising first, second, third and fourth viral vectors or lipoplexes (e.g., LNPs) comprising one or more~~

polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively, or one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
- c) ~~a third viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively; and~~
- d) ~~a fourth viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.~~

252. ~~The kit of any one of claims 216 to 229, comprising first, second, third and fourth viral vectors or lipoplexes (e.g., LNPs) comprising one or more~~

polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:

- a) ~~a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- c) ~~a third viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively; and~~
- d) ~~a fourth viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively.~~

253. ~~The kit of any one of claims 230 to 252, wherein the viral vectors are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.~~

254. ~~The kit of any one of claims 230 to 252, wherein the viral vectors are Cali mammarenavirus (a.k.a. Pichinde mammarenavirus or Pichinde arenavirus) viral vector.~~

~~255. The kit of any one of claims 230 to 252, wherein the viral vectors are adenoviral vectors, e.g., chimpanzee adenoviral vectors (ChAds).~~

~~256. The kit of any one of claims 216 to 255, comprising a polynucleotide comprising or consisting of a nucleic acid sequence of any one of SEQ ID NOs: 130-167, 210-219 and 225-226, or a nucleic acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130-167, 210-219 and 225-226.~~

~~257. The kit of any one of claims 216 to 256, comprising a polynucleotide comprising or consisting of a nucleic acid sequence of any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, 158, 225 and 226, or a nucleic acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, 158, 225 and 226.~~

~~258. The kit of any one of claims 216 to 257, comprising the following first polynucleotide and second polynucleotide, one or more vectors, or one or more lipoplexes (e.g., LNPs) comprising the following first polynucleotide and second polynucleotide:~~

- ~~• SEQ ID NOs: 130 and 132, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130 and 132, respectively;~~
- ~~• SEQ ID NOs: 130 and 134, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130 and 134, respectively;~~
- ~~• SEQ ID NOs: 131 and 133, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 133, respectively;~~
- ~~• SEQ ID NOs: 131 and 135, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 135, respectively;~~
- ~~• SEQ ID NOs: 132 and 136, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 132 and 136, respectively;~~

- ~~SEQ ID NOs: 133 and 135, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 135, respectively;~~
- ~~SEQ ID NOs: 133 and 137, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 137, respectively;~~
- ~~SEQ ID NOs: 134 and 136, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 134 and 136, respectively;~~
- ~~SEQ ID NOs: 135 and 137, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 135 and 137, respectively;~~
- ~~SEQ ID NOs: 138 and 141, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 138 and 141, respectively;~~
- ~~SEQ ID NOs: 138 and 144, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 138 and 144, respectively;~~
- ~~SEQ ID NOs: 139 and 142, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 142, respectively;~~
- ~~SEQ ID NOs: 139 and 145, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 145, respectively;~~
- ~~SEQ ID NOs: 140 and 146, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively;~~
- ~~SEQ ID NOs: 142 and 148, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 142 and 148, respectively;~~
- ~~SEQ ID NOs: 143 and 149, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively;~~

- ~~SEQ ID NOs: 145 and 148, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 145 and 148, respectively;~~
- ~~SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively;~~
- ~~SEQ ID NOs: 150 and 155, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 155, respectively;~~
- ~~SEQ ID NOs: 151 and 153, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 151 and 153, respectively;~~
- ~~SEQ ID NOs: 151 and 156, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 151 and 156, respectively;~~
- ~~SEQ ID NOs: 152 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 152 and 158, respectively;~~
- ~~SEQ ID NOs: 153 and 159, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 153 and 159, respectively;~~
- ~~SEQ ID NOs: 154 and 157, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157, respectively;~~
- ~~SEQ ID NOs: 155 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 155 and 158, respectively;~~
- ~~SEQ ID NOs: 156 and 159, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 156 and 159, respectively;~~
- ~~SEQ ID NOs: 160 and 161, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 160 and 161, respectively;~~

- ~~SEQ ID NOs: 162 and 163, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 162 and 163, respectively;~~
- ~~SEQ ID NOs: 164 and 165, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 164 and 165, respectively;~~
- ~~SEQ ID NOs: 166 and 167, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 166 and 167, respectively;~~
- ~~SEQ ID NOs: 210 and 211, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 210 and 211, respectively;~~
- ~~SEQ ID NOs: 212 and 213, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 212 and 213, respectively;~~
- ~~SEQ ID NOs: 214 and 215, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 214 and 215, respectively;~~
- ~~SEQ ID NOs: 216 and 217, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 216 and 217, respectively;~~
- ~~SEQ ID NOs: 218 and 219, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 218 and 219, respectively;~~
- ~~SEQ ID NOs: 218 and 226, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 218 and 226, respectively; or~~
- ~~SEQ ID NOs: 225 and 226, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 225 and 226, respectively.~~

259. — The kit of any one of claims 216 to 258, comprising first and second viral vectors or lipoplexes (*e.g.*, LNPs) comprising the following first polynucleotide and second polynucleotide:

a) ~~— a first vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 131 and 135, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 135, respectively, and~~

b) ~~— a second vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 133 and 137, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 137, respectively.~~

260. ~~— The kit of any one of claims 216 to 258, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising the following first polynucleotide and second polynucleotide:~~

a) ~~— a first vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 139 and 145, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 145, respectively, and~~

b) ~~— a second vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 143 and 149, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 145, respectively.~~

261. ~~— The kit of any one of claims 216 to 260, comprising first, second, third and fourth viral vectors or lipoplexes (e.g., LNPs), each vector or lipoplex (e.g., LNP) comprising first and second polynucleotides:~~

a) ~~— a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 131 and 135, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 135, respectively;~~

b) ~~— a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 133 and 137, or that are at least 80%,~~

~~81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 137, respectively;~~

~~e) a third viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 139 and 145, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 145, respectively; and~~

~~d) a fourth viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 142 and 148, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 142 and 148, respectively.~~

~~262. — The kit of any one of claims 216 to 258, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising the following first polynucleotide and second polynucleotide:~~

~~a) — a first vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 140 and 146, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively, and~~

~~b) — a second vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 143 and 149, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively.~~

~~263. — The kit of claim 262, wherein the first and second viral vectors are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.~~

~~264. — The kit of any one of claims 216 to 258, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising the following first polynucleotide and second polynucleotide:~~

a) — a first vector or lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively, and

b) — a second vector or lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, respectively.

265. — The kit of claim 264, wherein the first and second viral vectors are Cali mammarenavirus (*a.k.a.* Pichinde mammarenavirus or Pichinde arenavirus) viral vectors.

266. — The kit of any one of claims 216 to 258 and 262 to 265, comprising first, second, third and fourth viral vectors or lipoplexes (*e.g.*, LNPs), each vector or lipoplex (*e.g.*, LNP) comprising first and second polynucleotides:

a) — a first viral vector or lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 140 and 146, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively;

b) — a second viral vector or lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 143 and 149, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively;

c) — a third viral vector or lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively; and

d) — a fourth viral vector or lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and

~~158, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, respectively.~~

~~267. — The kit of any one of claims 216 to 258, comprising first, second, third and fourth viral vectors or lipoplexes (e.g., LNPs), each vector or lipoplex (e.g., LNP) comprising first and second polynucleotides:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively;~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 155 and 158, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 155 and 158, respectively;~~
- ~~c) a third viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 151 and 153, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 151 and 153, respectively; and~~
- ~~d) a fourth viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 156 and 159, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 156 and 159, respectively.~~

~~268. — The kit of claim 267, wherein one or more of the first, second, third and fourth vectors are adenoviral vectors.~~

~~269. — The kit of any one of claims 216 to 258, comprising first and second viral vectors or lipoplexes (e.g., LNPs) comprising the following first polynucleotide and second polynucleotide:~~

a) — a first vector or lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 160 and 161, or polynucleotides that are at least ~~80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99%~~ identical to any one of SEQ ID NOs: 160 and 161, respectively, and

b) — a second vector or lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 162 and 163, or polynucleotides that are at least ~~80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99%~~ identical to any one of SEQ ID NOs: 162 and 163, respectively.

270. — The kit of any one of claims 216 to 258, comprising first and second viral vectors comprising the following first polynucleotide and second polynucleotide:

a) — a first vector or lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 164 and 165, or polynucleotides that are at least ~~80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99%~~ identical to any one of SEQ ID NOs: 164 and 165, respectively, and

b) — a second vector or lipoplex (*e.g.*, LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 166 and 167, or polynucleotides that are at least ~~80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99%~~ identical to any one of SEQ ID NOs: 166 and 167, respectively.

271. — The kit of any one of claims 216 to 258, comprising (a) a first vector or lipoplex (*e.g.*, LNP) comprising a first polynucleotide comprising SEQ ID NO: 210, or a polynucleotide that is at least ~~80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99%~~ identical to SEQ ID NO: 210, and (b) a second vector or lipoplex (*e.g.*, LNP) comprising a second polynucleotide comprising SEQ ID NO: 211, or a polynucleotide that is at least ~~80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99%~~ identical to SEQ ID NO: 211.

272. — The kit of any one of claims 216 to 258, comprising (a) a first vector or lipoplex (*e.g.*, LNP) comprising a first polynucleotide comprising SEQ ID NO: 212, or a

~~polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 212, and (b) a second vector or lipoplex (e.g., LNP) comprising a second polynucleotide comprising SEQ ID NO: 213, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 213.~~

~~273. The kit of any one of claims 216 to 258, comprising (a) a first vector or lipoplex (e.g., LNP) comprising a first polynucleotide comprising SEQ ID NO: 214, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 214, and (b) a second vector or lipoplex (e.g., LNP) comprising a second polynucleotide comprising SEQ ID NO: 215, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 215.~~

~~274. The kit of any one of claims 216 to 258, comprising (a) a first vector or lipoplex (e.g., LNP) comprising a first polynucleotide comprising SEQ ID NO: 216, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 216, and (b) a second vector or lipoplex (e.g., LNP) comprising a second polynucleotide comprising SEQ ID NO: 217, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 217.~~

~~275. The kit of any one of claims 216 to 258, comprising (a) a first vector or lipoplex (e.g., LNP) comprising a first polynucleotide comprising SEQ ID NO: 218, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 218, and (b) a second vector or lipoplex (e.g., LNP) comprising a second polynucleotide comprising SEQ ID NO: 219, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 219.~~

~~276.— The kit of any one of claims 216 to 258, comprising (a) a first vector or lipoplex (e.g., LNP) comprising a first polynucleotide comprising SEQ ID NO: 218, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 218, and (b) a second vector or lipoplex (e.g., LNP) comprising a second polynucleotide comprising SEQ ID NO: 226, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 226.~~

~~277.— The kit of any one of claims 216 to 258, comprising (a) a first vector or lipoplex (e.g., LNP) comprising a first polynucleotide comprising SEQ ID NO: 225, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 225, and (b) a second vector or lipoplex (e.g., LNP) comprising a second polynucleotide comprising SEQ ID NO: 226, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 226.~~

~~278.— The kit of any one of claims 216 to 277, comprising a compound fusion polypeptide, a vector, or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide, the compound fusion polypeptide comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 105 112, 200 209, 222 223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 105 112, 200 209, 222 223 and 227.~~

~~279.— The kit of any one of claims 216 to 278, comprising a compound fusion polypeptide, a vector, or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide, the compound fusion polypeptide comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 209, 222 and 223, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 209, 222 and 223.~~

~~280.—The kit of any one of claims 216 to 279, wherein the one or more fusion polypeptides do not comprise any polypeptide segments corresponding to Gag 54-146; Gag 370-500; Pol 1-55; Pol 118-128; Pol 321-366; Pol 432-541; Pol 607-682; Pol 709-746; Pol 828-839; Pol 921-931; Nef 1-63; Nef 100-116 and Nef 149-206, or fragments or subsequences thereof, wherein the Gag, Pol and Nef amino acid position numbers correspond to SEQ ID NOs: 1, 2 and 3, respectively.~~

~~281.—The kit of any one of claims 216 to 280, wherein the one or more fusion polypeptides do not comprise any polypeptide segments having an amino acid sequence of SEQ ID NOs: 35-47, or fragments or subsequences thereof, or an amino acid sequence at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 35-47, or fragments or subsequences thereof.~~

~~282.—The kit of any one of claims 216 to 281, further comprising one or more unitary doses of one or more additional therapeutic agents.~~

~~283.—The kit of claim 282, comprising one or more agents that activate latent HIV, e.g., one or more latency reversing agents (LRAs).~~

~~284.—The kit of any one of claims 282 to 283, comprising one or more LRAs selected from agonists or activators of one or more toll like receptors (TLRs), histone deacetylase (HDAC) inhibitors, proteasome inhibitors, protein kinase C (PKC) activators, Smyd2 inhibitors, BET bromodomain 4 (BRD4) inhibitors, ionomycin, inhibitor of apoptosis proteins (IAP) antagonists, and second mitochondria derived activator of caspases (SMAC) mimetics.~~

~~285.—The kit of any one of claims 282 to 284, comprising one or more agonists or activators of one or more toll like receptors (TLRs).~~

~~286.—The kit of claim 285, wherein the TLR agonist or activator is selected from a TLR2 agonist, a TLR3 agonist, a TLR4 agonist, a TLR5 agonist, a TLR7 agonist, a TLR8 agonist and a TLR9 agonist.~~

~~287.—The kit of any one of claims 285 to 286, wherein the TLR7 agonist is selected from GS 9620 (vesatolimod), R848 (Resiquimod), DS-0509, LHC-165 and TMX-~~

101 (imiquimod), and/or wherein the TLR8 agonist is selected from GS-9688 (Selgantolimod), R848 (Resiquimod) and NKTR-262 (dual TLR7/TLR8 agonist).

288. — The kit of any one of claims 282 to 287, comprising one or more interleukin receptor agonists of an interleukin selected from IL-2, IL-7, IL-12 and IL-15.

289. — The kit of claim 288, comprising one or more cytokines selected from IL-2, IL-7, IL-12, IL-15, and variants thereof.

290. — The kit of any one of claims 282 to 289, comprising one or more innate immune activators.

291. — The kit of claim 290, wherein the one or more innate immune activators comprises an agonist of a receptor selected from fms-related tyrosine kinase 3 (FLT3), stimulator of interferon genes (STING) receptor, DExD/H-box helicase 58 (DDX58; *a.k.a.*, RIG-I), nucleotide binding oligomerization domain-containing 2 (NOD2).

292. — The kit of any one of claims 282 to 291, comprising an agonist of fms-related tyrosine kinase 3 (FLT3).

293. — The kit of any one of claims 282 to 292, comprising one or more antagonists or inhibitors of an inhibitory immune checkpoint protein or receptor and/or one or more activators or agonists of a stimulatory immune checkpoint protein or receptor.

294. — The kit of claim 293, wherein the one or more immune checkpoint proteins or receptors are selected from: CD27, CD70; CD40, CD40LG; CD47, CD48 (SLAMF2), transmembrane and immunoglobulin domain-containing 2 (TMIGD2, CD28H), CD84 (LY9B, SLAMF5), CD96, CD160, MS4A1 (CD20), CD244 (SLAMF4); CD276 (B7H3); V-set domain-containing T cell activation inhibitor 1 (VTCN1, B7H4); V-set immunoregulatory receptor (VSIR, B7H5, VISTA); immunoglobulin superfamily member 11 (IGSF11, VSIG3); natural killer cell cytotoxicity receptor 3 ligand 1 (NCR3LG1, B7H6); HERV-H LTR-associating 2 (HHLA2, B7H7); inducible T cell co-stimulator (ICOS, CD278); inducible T cell costimulator ligand (ICOSLG, B7H2); TNF receptor superfamily member 4 (TNFRSF4, OX40); TNF superfamily member 4 (TNFSF4, OX40L); TNFRSF8 (CD30), TNFSF8 (CD30L); TNFRSF10A (CD261, DR4, TRAILR1), TNFRSF9 (CD137), TNFSF9 (CD137L); TNFRSF10B (CD262, DR5, TRAILR2), TNFRSF10 (TRAIL); TNFRSF14 (HVEM, CD270), TNFSF14 (HVEML); CD272 (B and

T lymphocyte associated (BTLA)); TNFRSF17 (BCMA, CD269), TNFSF13B (BAFF); TNFRSF18 (GITR), TNFSF18 (GITRL); MHC class I polypeptide related sequence A (MICA); MHC class I polypeptide related sequence B (MICB); CD274 (CD274, PDL1, PD-L1); programmed cell death 1 (PDCD1, PD1, PD-1); cytotoxic T lymphocyte associated protein 4 (CTLA4, CD152); CD80 (B7-1), CD28; nectin cell adhesion molecule 2 (NECTIN2, CD112); CD226 (DNAM-1); Poliovirus receptor (PVR) cell adhesion molecule (PVR, CD155); PVR related immunoglobulin domain containing (PVRIG, CD112R); T cell immunoreceptor with Ig and ITIM domains (TIGIT); T cell immunoglobulin and mucin domain containing 4 (TIMD4; TIM4); hepatitis A virus cellular receptor 2 (HAVCR2, TIMD3, TIM3); galectin 9 (LGALS9); lymphocyte activating 3 (LAG3, CD223); signaling lymphocytic activation molecule family member 1 (SLAMF1, SLAM, CD150); lymphocyte antigen 9 (LY9, CD229, SLAMF3); SLAM family member 6 (SLAMF6, CD352); SLAM family member 7 (SLAMF7, CD319); UL16 binding protein 1 (ULBP1); UL16 binding protein 2 (ULBP2); UL16 binding protein 3 (ULBP3); retinoic acid early transcript 1E (RAET1E; ULBP4); retinoic acid early transcript 1G (RAET1G; ULBP5); retinoic acid early transcript 1L (RAET1L; ULBP6); lymphocyte activating 3 (CD223); killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR, CD158E1); killer cell lectin like receptor C1 (KLRC1, NKG2A, CD159A); killer cell lectin like receptor K1 (KLRK1, NKG2D, CD314); killer cell lectin like receptor C2 (KLRC2, CD159c, NKG2C); killer cell lectin like receptor C3 (KLRC3, NKG2E); killer cell lectin like receptor C4 (KLRC4, NKG2F); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 1 (KIR2DL1); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 2 (KIR2DL2); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 3 (KIR2DL3); killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR3DL1); killer cell lectin like receptor D1 (KLRD1); and SLAM family member 7 (SLAMF7).

295.— The kit of any one of claims 293 to 294, comprising one or more blockers or inhibitors of one or more T-cell inhibitory immune checkpoint proteins or receptors.

296.— The kit of claim 295, wherein the T-cell inhibitory immune checkpoint proteins or receptors are selected from CD274 (CD274, PDL1, PD-L1); programmed cell death 1 ligand 2 (PDCD1LG2, PD-L2, CD273); programmed cell death 1

(PDCD1, PD1, PD-1); cytotoxic T lymphocyte associated protein 4 (CTLA4, CD152); CD276 (B7H3); V-set domain containing T cell activation inhibitor 1 (VTCN1, B7H4); V-set immunoregulatory receptor (VSIR, B7H5, VISTA); immunoglobulin superfamily member 11 (IGSF11, VSIG3); TNFRSF14 (HVEM, CD270), TNFSF14 (HVEML); CD272 (B and T lymphocyte associated (BTLA)); PVR related immunoglobulin domain containing (PVRIG, CD112R); T cell immunoreceptor with Ig and ITIM domains (TIGIT); lymphocyte activating 3 (LAG3, CD223); hepatitis A virus cellular receptor 2 (HAVCR2, TIMD3, TIM3); galectin 9 (LGALS9); killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR, CD158E1); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 1 (KIR2DL1); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 2 (KIR2DL2); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 3 (KIR2DL3); and killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR3DL1).

297. — The kit of any one of claims 293 to 296, comprising one or more agonists or activators of one or more T cell stimulatory immune checkpoint proteins or receptors.

298. — The kit of claim 297, wherein the T cell stimulatory immune checkpoint proteins or receptors are selected from CD27, CD70; CD40, CD40LG; inducible T cell costimulator (ICOS, CD278); inducible T cell costimulator ligand (ICOSLG, B7H2); TNF receptor superfamily member 4 (TNFRSF4, OX40); TNF superfamily member 4 (TNFSF4, OX40L); TNFRSF9 (CD137), TNFSF9 (CD137L); TNFRSF18 (GITR), TNFSF18 (GITRL); CD80 (B7-1), CD28; nectin cell adhesion molecule 2 (NECTIN2, CD112); CD226 (DNAM-1); Poliovirus receptor (PVR) cell adhesion molecule (PVR, CD155).

299. — The kit of any one of claims 293 to 298, comprising one or more blockers or inhibitors of one or more NK cell inhibitory immune checkpoint proteins or receptors.

300. — The kit claim 299, wherein the NK cell inhibitory immune checkpoint proteins or receptors are selected from killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR, CD158E1); killer cell immunoglobulin

like receptor, two Ig domains and long cytoplasmic tail 1 (KIR2DL1); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 2 (KIR2DL2); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 3 (KIR2DL3); killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR3DL1); killer cell lectin like receptor C1 (KLRC1, NKG2A, CD159A); and killer cell lectin like receptor D1 (KLRD1, CD94).

301. — The kit of any one of claims 293 to 300, comprising one or more agonists or activators of one or more NK cell stimulatory immune checkpoint proteins or receptors.

302. — The kit of claim 301, wherein the NK cell stimulatory immune checkpoint proteins or receptors are selected from CD16, CD226 (DNAM 1); killer cell lectin like receptor K1 (KLRK1, NKG2D, CD314); and SLAM family member 7 (SLAMF7).

303. — The kit of any one of claims 293 to 302, wherein the one or more immune checkpoint inhibitors comprises a proteinaceous inhibitor of PD-L1 (CD274), PD-1 (PDCD1) or CTLA4.

304. — The kit of any one of claims 293 to 303, comprising an antibody that binds to CTLA4.

305. — The kit of claim 303 or claim 304, wherein the proteinaceous or antibody inhibitor of CTLA4 is selected from ipilimumab, tremelimumab, BMS-986218, AGEN1181, AGEN1884, BMS-986249, MK-1308, REGN-4659, ADU-1604, CS-1002, BCD-145, APL-509, JS-007, BA-3071, ONC-392, AGEN-2041, JHL-1155, KN-044, CG-0161, ATOR-1144, PBI-5D3H5, FPT-155 (CTLA4/PD-L1/CD28), PF-06936308 (PD-1/CTLA4), MGD-019 (PD-1/CTLA4), KN-046 (PD-1/CTLA4), MEDI-5752 (CTLA4/PD-1), XmAb-20717 (PD-1/CTLA4) and AK-104 (CTLA4/PD-1).

306. — The kit of claim 303, wherein the proteinaceous inhibitor of PD-L1 (CD274) or PD-1 (PDCD1) is selected from pembrolizumab, nivolumab, cemiplimab, pidilizumab, AMP-224, MEDI0680 (AMP-514), spartalizumab, atezolizumab, avelumab, durvalumab, BMS-936559, CK-301, PF-06801591, BGB-A317 (tislectizumab), GLS-010 (WBP-3055), AK-103 (HX-008), AK-105, CS-1003, HLX-10, MGA-012, BI-754091,

AGEN 2034, JS 001 (toripalimab), JNJ 63723283, genolimzumab (CBT 501), LZM 009, BCD 100, LY 3300054, SHR 1201, SHR 1210 (camrelizumab), Sym 021, ABBV 181, PD1 PIK, BAT 1306, (MSB0010718C), CX 072, CBT 502, TSR 042 (dostarlimab), MSB 2311, JTX 4014, BGB A333, SHR 1316, CS 1001 (WBP 3155, KN 035, IBI 308 (sintilimab), HLX 20, KL A167, STI A1014, STI A1015 (IMC 001), BCD 135, FAZ 053, TQB 2450, MDX1105 01, FPT 155 (CTLA4/PD L1/CD28), PF 06936308 (PD 1/CTLA4), MGD 013 (PD 1/LAG 3), FS 118 (LAG 3/PD L1) MGD 019 (PD 1/CTLA4), KN 046 (PD 1/CTLA4), MEDI 5752 (CTLA4/PD 1), RO 7121661 (PD 1/TIM 3), XmAb 20717 (PD 1/CTLA4), AK 104 (CTLA4/PD 1), M7824 (PD L1/TGF β EC domain), CA 170 (PD L1/VISTA), CDX 527 (CD27/PD L1), LY 3415244 (TIM3/PDL1), and INBRX 105 (4 1BB/PDL1).

307. — The kit of any one of claims 293 to 306, wherein the one or more immune checkpoint inhibitors comprises a small molecule inhibitor of CD274 (PDL1, PD L1), programmed cell death 1 (PDCD1, PD1, PD 1) or CTLA4.

308. — The kit of claim 307, wherein the small molecule inhibitor of CD274 or PDCD1 is selected from GS 4224, GS 4416, INCB086550 and MAX10181.

309. — The kit of claim 307, wherein the small molecule inhibitor of CTLA4 comprises BPI 002.

310. — The kit of any one of claims 282 to 309, further comprising one or more antiviral agents.

311. — The kit of claim 310, wherein the one or more antiviral agents are selected from HIV protease inhibitors, HIV reverse transcriptase inhibitors, HIV integrase inhibitors, HIV non-catalytic site (or allosteric) integrase inhibitors, HIV entry (fusion) inhibitors, HIV maturation inhibitors and capsid inhibitors.

312. — A method for eliciting an immune response to human immunodeficiency virus (HIV) in a subject in need thereof, comprising administering to the subject the immunogenic composition of any one of claims 145 to 215.

313. — An immunogenic composition of any one of claims 145 to 215 for use as a medicament.

~~314.—A method of treating or preventing human immunodeficiency virus (HIV) in a subject in need thereof, comprising administering to the subject the immunogenic composition of any one of claims 145 to 215.~~

~~315.—An immunogenic composition of any one of claims 145 to 215 for use in a method of treating or preventing human immunodeficiency virus (HIV) in a subject in need thereof.~~

~~316.—The method or use of any one of claims 312 to 315, comprising administering a single vector comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide.~~

~~317.—The method or use of any one of claims 312 to 315, wherein two or more fusion polypeptides, two or more compound fusion polypeptides, two or more polynucleotides encoding the fusion polypeptides, two or more viral expression vectors comprising polynucleotides encoding the fusion polypeptides, two or more lipoplexes (e.g., LNPs), or two or more immunogenic compositions are administered to the subject simultaneously or concurrently.~~

~~318.—The method of any one of claims 312 to 317, wherein two or more fusion polypeptides, or two or more polynucleotides or two or more viral expression vectors encoding the fusion polypeptides, are in the form of a bivalent antigen composition.~~

~~319.—The method of any one of claims 312 to 318, comprising administering a first fusion polypeptide and a second fusion polypeptide, first and second polynucleotides encoding the first and second fusion polypeptides, one or more vectors comprising one or more polynucleotides encoding the first and second fusion polypeptides, one or more lipoplexes (e.g., LNPs), the first and second polypeptides comprising the following polypeptide segments, in sequential order, from N terminus to C terminus, optionally joined or connected by one or more linkers:~~

- ~~• SEQ ID NOs: 6, 4, 16 and 26, and SEQ ID NOs: 7, 5, 27 and 17;~~
- ~~• SEQ ID NOs: 12, 24, 8 and 10, and SEQ ID NOs: 9, 25, 13 and 11;~~
- ~~• SEQ ID NOs: 14, 22, 18, 24 and 20, and SEQ ID NOs: 15, 25, 19, 23 and 21;~~
- ~~• SEQ ID NOs: 26, 16, 4 and 6, and SEQ ID NOs: 7, 27, 5 and 17;~~
- ~~• SEQ ID NOs: 8, 24, 12 and 10, and SEQ ID NOs: 13, 25, 9 and 11;~~
- ~~• SEQ ID NOs: 22, 24, 14, 18 and 20, and SEQ ID NOs: 25, 23, 15, 21 and 19;~~

- ~~SEQ ID NOs: 20, 6, 4, 18, 16 and 26, and SEQ ID NOs: 7, 19, 5, 21, 27 and 17;~~
- ~~SEQ ID NOs: 8, 24, 14, 12, 22 and 10, and SEQ ID NOs: 9, 13, 25, 23, 15 and 11;~~
- ~~SEQ ID NOs: 18, 26, 20, 4, 6 and 16, and SEQ ID NOs: 7, 21, 17, 5, 27 and 19;~~
- ~~SEQ ID NOs: 22, 24, 12, 14, 8 and 10, and SEQ ID NOs: 15, 25, 9, 23, 13 and 11;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 8, 30, 14, 12, 26 and 10;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 7, 21, 5, 25, 33 and 19;~~
- ~~SEQ ID NOs: 24, 6, 4, 20, 18 and 32, and SEQ ID NOs: 8, 30, 14, 12, 26 and 10;~~
- ~~SEQ ID NOs: 8, 30, 14, 12, 26 and 10, and SEQ ID NOs: 9, 13, 31, 27, 15 and 11;~~
- ~~SEQ ID NOs: 6, 20, 4, 24, 32 and 18, and SEQ ID NOs: 8, 12, 30, 26, 14 and 10;~~
- ~~SEQ ID NOs: 7, 21, 5, 25, 33 and 19 and SEQ ID NOs: 9, 13, 31, 27, 15 and 11;~~
- ~~SEQ ID NOs: 20, 32, 24, 4, 6 and 18, and SEQ ID NOs: 26, 30, 12, 14, 8 and 10;~~
- ~~SEQ ID NOs: 7, 25, 19, 5, 33 and 21, and SEQ ID NOs: 15, 31, 9, 27, 13 and 11;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 26, 20, 10 and 28;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 26, 10, 20 and 28;~~
- ~~SEQ ID NOs: 24, 6, 16 and 18, and SEQ ID NOs: 7, 25, 17 and 19;~~
- ~~SEQ ID NOs: 7, 19, 17 and 25, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 24, 16, 6 and 18, and SEQ ID NOs: 27, 11, 21 and 29;~~
- ~~SEQ ID NOs: 7, 25, 17 and 19, and SEQ ID NOs: 11, 27, 21 and 29;~~
- ~~SEQ ID NOs: 7, 25, 17 and 19, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 22, 6, 20 and 28, and SEQ ID NOs: 23, 7, 21 and 29;~~
- ~~SEQ ID NOs: 22, 20, 6 and 28, and SEQ ID NOs: 7, 21, 23 and 29;~~
- ~~SEQ ID NOs: 26, 10, 20 and 28, and SEQ ID NOs: 21, 27, 11 and 29;~~
- ~~SEQ ID NOs: 22, 6, 16, 20, 18, 28, 26 and 10; or~~
- ~~SEQ ID NOs: 7, 21, 19, 17, 27, 25, 29 and 11.~~

320. ~~The method of any one of claims 312 to 319, comprising administering one or more fusion polypeptides, one or more polynucleotides encoding one or more fusion polypeptides, one or more vectors comprising one or more polynucleotides encoding one or more fusion polypeptides, one or more lipoplexes (e.g., LNPs), the one or more fusion polypeptides comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 70-101, 105-112, 200-209, 222-223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%,~~

~~94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70-101, 105-112, 200-209, 222-223 and 227.~~

~~321.—The method of any one of claims 312 to 320, comprising administering one or more fusion polypeptides, one or more polynucleotides encoding one or more fusion polypeptides, one or more vectors comprising one or more polynucleotides encoding one or more fusion polypeptides, one or more lipoplexes (e.g., LNPs), the one or more fusion polypeptides comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 82-83, 85-87, 98-101, 209 and 222-223, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82-83, 85-87, 98-101, 209 and 222-223.~~

~~322.—The method of any one of claims 312 to 321, comprising administering the following first fusion polypeptide and second fusion polypeptide, one or more polynucleotides, one or more vectors or one or more lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- ~~• SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
- ~~• SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~
- ~~• SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~
- ~~• SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~
- ~~• SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~

- ~~SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~
- ~~SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- ~~SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~
- ~~SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~
- ~~SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~
- ~~SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~
- ~~SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively;~~

- ~~SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively;~~
- ~~SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~
- ~~SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively;~~
- ~~SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~
- ~~SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~
- ~~SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- ~~SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- ~~SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
- ~~SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
- ~~SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~

- ~~SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~
- ~~SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~
- ~~SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively;~~
~~or~~
- ~~SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively.~~

~~323. The method of any one of claims 312 to 322, comprising administering the following first fusion polypeptide and second fusion polypeptide, one or more vectors, or one or more lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, in sequential order, from N terminus to C terminus, optionally joined or connected by one or more linkers:~~

- ~~SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
- ~~SEQ ID NOs: 71 and 70, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 71 and 70, respectively;~~
- ~~SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~

- ~~SEQ ID NOs: 73 and 72, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 73 and 72, respectively;~~
- ~~SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~
- ~~SEQ ID NOs: 75 and 74, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 75 and 74, respectively;~~
- ~~SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~
- ~~SEQ ID NOs: 77 and 76, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 77 and 76, respectively;~~
- ~~SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~
- ~~SEQ ID NOs: 79 and 78, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 79 and 78, respectively;~~
- ~~SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~
- ~~SEQ ID NOs: 81 and 80, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 81 and 80, respectively;~~
- ~~SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- ~~SEQ ID NOs: 83 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 82, respectively;~~

- ~~SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 84, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 84, respectively;~~
- ~~SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 86, respectively;~~
- ~~SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~SEQ ID NOs: 89 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 89 and 88, respectively;~~
- ~~SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~
- ~~SEQ ID NOs: 85 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 82, respectively;~~
- ~~SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~SEQ ID NOs: 86 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 82, respectively;~~
- ~~SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~

- ~~SEQ ID NOs: 88 and 82, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 82, respectively;~~
- ~~SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 83, respectively;~~
- ~~SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 85, respectively;~~
- ~~SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively;~~
- ~~SEQ ID NOs: 87 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 88, respectively;~~
- ~~SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 84, respectively;~~
- ~~SEQ ID NOs: 88 and 84, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 84, respectively;~~
- ~~SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~
- ~~SEQ ID NOs: 89 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 89 and 85, respectively;~~

- ~~SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively;~~
- ~~SEQ ID NOs: 101 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 85, respectively;~~
- ~~SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~
- ~~SEQ ID NOs: 91 and 90, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 91 and 90, respectively;~~
- ~~SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~
- ~~SEQ ID NOs: 93 and 92, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 93 and 92, respectively;~~
- ~~SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- ~~SEQ ID NOs: 95 and 94, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 94, respectively;~~
- ~~SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- ~~SEQ ID NOs: 97 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 97 and 96, respectively;~~

- ~~SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
- ~~SEQ ID NOs: 96 and 94, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 94, respectively;~~
- ~~SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
- ~~SEQ ID NOs: 97 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 97 and 95, respectively;~~
- ~~SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 20 and 221, respectively;~~
- ~~SEQ ID NOs: 221 and 220, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 221 and 220, respectively;~~
- ~~SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~
- ~~SEQ ID NOs: 100 and 98, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 98, respectively;~~
- ~~SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~

- ~~SEQ ID NOs: 101 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 99, respectively;~~
- ~~SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively;~~
- ~~SEQ ID NOs: 99 and 98, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 98, respectively;~~
- ~~SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively; or~~
- ~~SEQ ID NOs: 101 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 101 and 100, respectively.~~

324. ~~The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) ~~a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively, and~~

b) ~~a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%,~~

~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively.~~

~~325. The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively, and~~

~~b) a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively.~~

~~326. The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively, and~~

~~b) a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%,~~

~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively.~~

~~327. — The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) — a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively, and~~

~~b) — a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively.~~

~~328. — The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) — a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively, and~~

~~b) — a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%,~~

~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively.~~

~~329. — The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) — a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively, and~~

~~b) — a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively.~~

~~330. — The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) — a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively, and~~

~~b) — a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%,~~

~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively.~~

331. — ~~The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) — ~~a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively, and~~

b) — ~~a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively.~~

332. — ~~The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) — ~~a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively, and~~

b) — ~~a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%,~~

~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively.~~

333. — ~~The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) — ~~a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively, and~~

b) — ~~a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively.~~

334. — ~~The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) — ~~a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively, and~~

b) — ~~a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%,~~

~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.~~

~~335. The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising first and second polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

~~a) a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 200, that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 200, and~~

~~b) a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide comprising SEQ ID NO: 201, or that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 201.~~

~~336. The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising first and second polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

~~a) a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 202, that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 202, and~~

~~b) a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide comprising SEQ ID NO: 203, or that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 203.~~

~~337. The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising first and second polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

a) — a first polynucleotide or first viral vector or first lipoplex (*e.g.*, LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 204, that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 204, and

b) — a second polynucleotide or second viral vector or second lipoplex (*e.g.*, LNP) comprising a polynucleotide encoding a second fusion polypeptide comprising SEQ ID NO: 205, or that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 205.

338. — The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (*e.g.*, LNPs) comprising first and second polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:

a) — a first polynucleotide or first viral vector or first lipoplex (*e.g.*, LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 105, that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 105, and

b) — a second polynucleotide or second viral vector or second lipoplex (*e.g.*, LNP) comprising a polynucleotide encoding a second fusion polypeptide comprising SEQ ID NO: 107, or that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 107.

339. — The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (*e.g.*, LNPs) comprising first and second polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:

a) — a first polynucleotide or first viral vector or first lipoplex (*e.g.*, LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 206, that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 206, and

b) — a second polynucleotide or second viral vector or second lipoplex (*e.g.*, LNP) comprising a polynucleotide encoding a second fusion polypeptide comprising SEQ ID NO: 207, or that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%,

~~89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 207.~~

~~340. The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising first and second polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

~~a) a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 208, that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 208, and~~

~~b) a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide comprising SEQ ID NO: 209 or SEQ ID NO: 227, or that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 209 or SEQ ID NO: 227.~~

~~341. The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising first and second polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

~~a) a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 222, that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222, and~~

~~b) a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide comprising SEQ ID NO: 209 or SEQ ID NO: 227, or that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 209 or SEQ ID NO: 227.~~

~~342. The method of any one of claims 312 to 323, comprising administering first and second viral vectors or first and second lipoplexes (e.g., LNPs) comprising first and second polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:~~

a) ~~— a first polynucleotide or first viral vector or first lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 222, that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222, and~~

b) ~~— a second polynucleotide or second viral vector or second lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide comprising SEQ ID NO: 223, or that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 223.~~

343. ~~The method of any one of claims 312 to 323, comprising administering a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively.~~

344. ~~The method of any one of claims 312 to 323, comprising administering a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively.~~

345. ~~The method of any one of claims 324 to 344, wherein the first and second viral vectors are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.~~

346. ~~The method of any one of claims 324 to 344, wherein the first and second viral vectors are Cali mammarenavirus (a.k.a. Pichinde mammarenavirus or Pichinde arenavirus) viral vectors.~~

347. ~~The method of any one of claims 324 to 344, wherein the first and second viral vectors are adenoviral vectors, e.g., chimpanzee adenoviral vectors (ChAds).~~

~~348.—The method of any one of claims 324 to 347, wherein the first and second viral vectors or first and second lipoplexes (e.g., LNPs) are co-administered concurrently.~~

~~349.—The method of any one of claims 312 to 348, comprising administering a polynucleotide comprising or consisting of a nucleic acid sequence of any one of SEQ ID NOs: 130-167, 210-219 and 225-226, or a nucleic acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130-167, 210-219 and 225-226.~~

~~350.—The method of any one of claims 312 to 349, comprising administering a polynucleotide comprising or consisting of a nucleic acid sequence of any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, 158, 225 and 226, or a nucleic acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, 158, 225 and 226.~~

~~351.—The method of any one of claims 312 to 350, comprising administering the following first polynucleotide and second polynucleotide, one or more vectors, or one or more lipoplexes (e.g., LNPs) comprising the following first polynucleotide and second polynucleotide:~~

- ~~• SEQ ID NOs: 130 and 132, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130 and 132, respectively;~~
- ~~• SEQ ID NOs: 130 and 134, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 130 and 134, respectively;~~
- ~~• SEQ ID NOs: 131 and 133, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 133, respectively;~~
- ~~• SEQ ID NOs: 131 and 135, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 135, respectively;~~

- ~~SEQ ID NOs: 132 and 136, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 132 and 136, respectively;~~
- ~~SEQ ID NOs: 133 and 135, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 135, respectively;~~
- ~~SEQ ID NOs: 133 and 137, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 137, respectively;~~
- ~~SEQ ID NOs: 134 and 136, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 134 and 136, respectively;~~
- ~~SEQ ID NOs: 135 and 137, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 135 and 137, respectively;~~
- ~~SEQ ID NOs: 138 and 141, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 138 and 141, respectively;~~
- ~~SEQ ID NOs: 138 and 144, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 138 and 144, respectively;~~
- ~~SEQ ID NOs: 139 and 142, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 142, respectively;~~
- ~~SEQ ID NOs: 139 and 145, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 145, respectively;~~
- ~~SEQ ID NOs: 140 and 146, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively;~~
- ~~SEQ ID NOs: 142 and 148, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 142 and 148, respectively;~~

- ~~SEQ ID NOs: 143 and 149, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively;~~
- ~~SEQ ID NOs: 145 and 148, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 145 and 148, respectively;~~
- ~~SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively;~~
- ~~SEQ ID NOs: 150 and 155, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 155, respectively;~~
- ~~SEQ ID NOs: 151 and 153, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 151 and 153, respectively;~~
- ~~SEQ ID NOs: 151 and 156, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 151 and 156, respectively;~~
- ~~SEQ ID NOs: 152 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 152 and 158, respectively;~~
- ~~SEQ ID NOs: 153 and 159, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 153 and 159, respectively;~~
- ~~SEQ ID NOs: 154 and 157, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157, respectively;~~
- ~~SEQ ID NOs: 155 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 155 and 158, respectively;~~
- ~~SEQ ID NOs: 156 and 159, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 156 and 159, respectively;~~

- ~~SEQ ID NOs: 160 and 161, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 160 and 161, respectively;~~
- ~~SEQ ID NOs: 162 and 163, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 162 and 163, respectively;~~
- ~~SEQ ID NOs: 164 and 165, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 164 and 165, respectively; or~~
- ~~SEQ ID NOs: 166 and 167, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 166 and 167, respectively;~~
- ~~SEQ ID NOs: 210 and 211, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 210 and 211, respectively;~~
- ~~SEQ ID NOs: 212 and 213, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 212 and 213, respectively;~~
- ~~SEQ ID NOs: 214 and 215, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 214 and 215, respectively;~~
- ~~SEQ ID NOs: 216 and 217, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 216 and 217, respectively;~~
- ~~SEQ ID NOs: 218 and 219, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 218 and 219, respectively;~~
- ~~SEQ ID NOs: 218 and 226, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 218 and 226, respectively;~~
- ~~SEQ ID NOs: 225 and 226, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 225 and 226, respectively.~~

~~352.—The method of any one of claims 312 to 351, comprising administering first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 140 and 146, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively, and~~
- ~~b) a second vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 143 and 149, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively, wherein the first and second viral vectors are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.~~

~~353.—The method of any one of claims 312 to 352, comprising administering first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following first polynucleotide and second polynucleotide:~~

- ~~a) a first vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively, and~~
- ~~b) a second vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, respectively, wherein the first and second viral vectors are Cali mammarenavirus (a.k.a. Pichinde mammarenavirus or Pichinde arenavirus) viral vectors.~~

~~354.—The method of any one of claims 312 to 323, comprising administering a compound fusion polypeptide, a vector, or a lipoplex (e.g., LNP)~~

~~comprising a polynucleotide encoding a compound fusion polypeptide, the compound fusion polypeptide comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 105-112, 200-209, 222-223 and 227, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 105-112, 200-209, 222-223 and 227.~~

~~355.—The method of any one of claims 312 to 323, comprising administering a compound fusion polypeptide, a vector, or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide, the compound fusion polypeptide comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 209, 222 and 223, or an amino acid sequence that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 209, 222 and 223.~~

~~356.—The method of any one of claims 312 to 355, wherein the one or more fusion polypeptides do not comprise any polypeptide segments corresponding to Gag 54-146; Gag 370-500; Pol 1-55; Pol 118-128; Pol 321-366; Pol 432-541; Pol 607-682; Pol 709-746; Pol 828-839; Pol 921-931; Nef 1-63; Nef 100-116 and Nef 149-206, or fragments or subsequences thereof, wherein the Gag, Pol and Nef amino acid position numbers correspond to SEQ ID NOs: 1, 2 and 3, respectively.~~

~~357.—The method of any one of claims 312 to 356, wherein the one or more fusion polypeptides do not comprise any polypeptide segments having an amino acid sequence of SEQ ID NOs: 35-47, or fragments or subsequences thereof, or an amino acid sequence at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 35-47, or fragments or subsequences thereof.~~

~~358.—The method of any one of claims 312 to 357, wherein the subject is infected with HIV-1, is suspected of being infected with HIV-1, or is at risk of being infected with HIV-1.~~

~~359.—The method of any one of claims 312 to 358, wherein the subject is chronically infected with HIV-1.~~

360.—The method of any one of claims 312 to 359, wherein the subject is acutely infected with HIV-1.

361.—The method of any one of claims 312 to 360, wherein the subject has an HIV-1 infection of Fiebig stage IV or earlier, *e.g.* Fiebig stage III, Fiebig stage II or Fiebig stage I.

362.—The method of any one of claims 312 to 361, wherein the fusion polypeptide, the compound fusion polypeptide, the polynucleotide, the vector, the lipoplex (*e.g.*, LNP) or the immunogenic composition is administered via a route selected from intravenous, intramuscular, intradermal, subcutaneous, intranodal and mucosal (*e.g.* buccal, intranasal, intrarectal, intravaginal).

363.—The method of any one of claims 312 to 362, comprising administering from about 10^3 to about 10^{12} viral focus forming units (FFU) or plaque forming units (PFU) or infectious units (IU) or viral particles (vp), *e.g.* from about 10^4 to about 10^7 viral FFU or PFU or IU or vp, *e.g.* from about 10^3 to about 10^4 , 10^5 , 10^6 , 10^7 , 10^8 , 10^9 , 10^{10} , 10^{11} , 10^{12} , 10^{13} , 10^{14} or 10^{15} viral FFU or PFU or IU or vp, per administration.

364.—The method of any one of claims 312 to 363, comprising a prime-boost regimen comprising administering a priming composition at a first time point and administering one or more boosting compositions at one or more subsequent time points.

365.—The method of claim 364, comprising repeating the prime-boost regimen one or more iterations.

366.—The method of any one of claims 364 to 365, wherein the administrations of the priming composition and the one or more boosting compositions are spaced at least 1 week, 2 weeks, 3 weeks or 1 month apart, *e.g.*, at least 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12 months apart.

367.—The method of any one of claims 364 to 366, wherein the priming composition and the boosting composition comprise the same immunogenic composition.

368.—The method of any one of claims 364 to 366, wherein the priming composition and the boosting composition comprise different immunogenic compositions.

~~369.—The method of any one of claims 364 to 366, wherein the priming composition and the boosting composition comprise the same one or more fusion polypeptides and same viral expression vector.~~

~~370.—The method of any one of claims 364 to 366, wherein the priming composition and the boosting composition comprise different fusion polypeptides and/or different viral expression vectors.~~

~~371.—The method of claim 370, comprising priming with a first viral expression vector, and boosting with a second viral expression vector.~~

~~372.—The method of any one of claims 364 to 371, wherein the prime-boost regimen comprises:~~

- ~~a) Priming with one or more viral expression vectors and boosting with one or more polynucleotides, wherein the one or more polynucleotides comprise DNA, cDNA, mRNA or self replicating RNA;~~
- ~~b) Priming with one or more polynucleotides, wherein the one or more polynucleotides comprise DNA, cDNA, mRNA or self replicating RNA, and boosting with one or more viral expression vectors;~~
- ~~c) Priming with one or more viral expression vectors, and boosting with one or more viral expression vectors, wherein the one or more viral expression vectors in the priming composition and the one or more viral expression vectors in the boosting composition are from identical, related or unrelated taxonomical families;~~
- ~~d) Priming with one or more replication deficient viral expression vectors and boosting with one or more replication deficient viral expression vectors, wherein the one or more replication deficient viral expression vectors in the priming composition and the one or more replication deficient viral expression vectors in the boosting composition are from identical, related or unrelated taxonomical families;~~
- ~~e) Priming with one or more replication attenuated viral expression vectors and boosting with one or more replication attenuated viral expression vectors, wherein the one or more replication attenuated viral expression vectors in the priming composition and the one or more replication attenuated viral expression~~

vectors in the boosting composition are from identical, related or unrelated taxonomical families;

- ~~f) Priming with one or more replication-deficient viral expression vectors and boosting with one or more replication-attenuated viral expression vectors;~~
- ~~g) Priming with one or more replication-attenuated viral expression vectors and boosting with one or more replication-deficient viral expression vectors;~~
- ~~h) Priming with one or more Lymphocytic choriomeningitis mammarenavirus (LCMV) viral expression vectors and boosting with one or more Pichinde mammarenavirus viral expression vectors;~~
- ~~i) Priming with one or more Pichinde mammarenavirus viral expression vectors and boosting with one or more Lymphocytic choriomeningitis mammarenavirus (LCMV) viral expression vectors;~~
- ~~j) Priming with one or more replication-deficient Pichinde mammarenavirus viral expression vectors and boosting with one or more replication-deficient Lymphocytic choriomeningitis mammarenavirus (LCMV) viral expression vectors;~~
- ~~k) Priming with one or more replication-deficient Lymphocytic choriomeningitis mammarenavirus (LCMV) viral expression vectors and boosting with one or more replication-deficient Pichinde mammarenavirus viral expression vectors;~~
- ~~l) Priming with one or more arenavirus viral expression vectors and boosting with one or more adenovirus viral expression vectors;~~
- ~~m) Priming with one or more adenovirus viral expression vectors and boosting with boosting composition comprising one or more arenavirus viral expression vectors;~~
- ~~n) Priming with one or more adenovirus viral expression vectors and boosting with boosting composition comprising one or more RNA molecules (e.g., mRNA, self-amplifying or self-replicating RNA);~~
- ~~o) Priming with one or more RNA molecules (e.g., mRNA, self-amplifying or self-replicating RNA) and boosting with boosting composition comprising one or more adenovirus viral expression vectors;~~
- ~~p) Priming with one or more chimpanzee adenoviral (ChAd) expression vectors and boosting with boosting composition comprising one or more self-amplifying or self-replicating RNA (saRNA or samRNA);~~

- ~~q) Priming with one or more self-amplifying or self-replicating RNA (saRNA or samRNA) and boosting with boosting composition comprising one or more chimpanzee adenoviral (ChAd) expression vectors;~~
- ~~r) Priming with one or more poxvirus viral expression vectors and boosting with one or more arenavirus viral expression vectors;~~
- ~~s) Priming with one or more arenavirus viral expression vectors and boosting with boosting composition comprising one or more poxvirus viral expression vectors;~~
- ~~t) Priming with one or more poxvirus viral expression vectors and boosting with one or more adenovirus viral expression vectors; or~~
- ~~u) Priming with one or more adenovirus viral expression vectors and boosting with boosting composition comprising one or more poxvirus viral expression vectors.~~

~~373.—The method of any one of claims 364 to 372, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising the following first fusion polypeptide and second fusion polypeptide, one or more vectors, or one or more lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~
 - ~~• SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
 - ~~• SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~
 - ~~• SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~
 - ~~• SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%,~~

~~95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~

- ~~• SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~
- ~~• SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~
- ~~• SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- ~~• SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~• SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~• SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~• SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~
- ~~• SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%,~~

~~95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~

- ~~• SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~
- ~~• SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~
- ~~• SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~
- ~~• SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively;~~
- ~~• SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively;~~
- ~~• SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~
- ~~• SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively;~~
- ~~• SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%,~~

~~95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~

- ~~• SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~
- ~~• SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- ~~• SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- ~~• SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
- ~~• SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
- ~~• SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~
- ~~• SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~
- ~~• SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%,~~

~~95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~

- ~~• SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively; or~~
- ~~• SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively; and~~

~~2) Boosting with an immunogenic composition comprising the following first fusion polypeptide and second fusion polypeptide, one or more vectors, or one or more lipoplexes (e.g., LNPs) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- ~~• SEQ ID NOs: 70 and 71, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 70 and 71, respectively;~~
- ~~• SEQ ID NOs: 72 and 73, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 72 and 73, respectively;~~
- ~~• SEQ ID NOs: 74 and 75, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 74 and 75, respectively;~~
- ~~• SEQ ID NOs: 76 and 77, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 76 and 77, respectively;~~
- ~~• SEQ ID NOs: 78 and 79, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%,~~

~~95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 78 and 79, respectively;~~

- ~~• SEQ ID NOs: 80 and 81, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 80 and 81, respectively;~~
- ~~• SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively;~~
- ~~• SEQ ID NOs: 84 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 85, respectively;~~
- ~~• SEQ ID NOs: 86 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 86 and 87, respectively;~~
- ~~• SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively;~~
- ~~• SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively;~~
- ~~• SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively;~~
- ~~• SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%,~~

~~95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively;~~

- ~~• SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively;~~
- ~~• SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively;~~
- ~~• SEQ ID NOs: 88 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 87, respectively;~~
- ~~• SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively;~~
- ~~• SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively;~~
- ~~• SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively;~~
- ~~• SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively;~~
- ~~• SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%,~~

~~95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively;~~

- ~~• SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~
- ~~• SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~
- ~~• SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~
- ~~• SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively;~~
- ~~• SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively;~~
- ~~• SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively;~~
- ~~• SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively;~~
- ~~• SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%,~~

~~95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively; or~~

- ~~• SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively.~~

~~374. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising the following first fusion polypeptide and second fusion polypeptide, one or more vectors, one or more lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively;~~

~~b) SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively;~~

~~c) SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively;~~

~~d) SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively; and/or~~

~~e) SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively; and~~

2) ~~Boosting with an immunogenic composition comprising the following first fusion polypeptide and second fusion polypeptide, one or more vectors, or one or more lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

- a) ~~SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively;~~
- b) ~~SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively;~~
- c) ~~SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively; and/or~~
- d) ~~SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.~~

375. ~~The method of any one of claims 364 to 374, wherein the prime-boost regimen comprises:~~

- 1) ~~Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~
 - a) ~~a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively, or one or more polynucleotides~~

~~encoding first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively; and~~

~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively; and~~

~~2) Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively; and~~

~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.~~

~~376. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

~~1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 82 and 85, or~~

~~fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively; and~~

- ~~2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 87 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 88, respectively.~~

~~377. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 82 and 85, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 85, respectively; and a second viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 87 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 87 and 88, respectively.~~

~~378. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively; and~~
- ~~2) Boosting with an immunogenic composition comprising a viral vector or a~~

lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively.

379. — The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 82 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 88, respectively; and a second viral vector or a lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 85 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 87, respectively.

380. — The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:

- 1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively; and
- 2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (*e.g.*, LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%,

~~87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively.~~

~~381. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively; and a second viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively.~~

~~382. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively; and~~
- ~~2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively.~~

~~383. The method of any one of claims 364 to 373, wherein the prime-~~

boost regimen comprises:

- 1) ~~Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 220 and 221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively; and~~
- 2) ~~Boosting with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively.~~

384. — ~~The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 94 and 96, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 96, respectively; and a second viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively.~~

385. — ~~The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 220 and~~

~~221, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 220 and 221, respectively; and a second viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 95 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 95 and 97, respectively.~~

386. — The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:

- ~~1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 94 and 95, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 94 and 95, respectively; and~~
- ~~2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 98 and 99, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 99, respectively.~~

387. — The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:

- ~~1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 105, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 105; and~~
- ~~2) Boosting with an immunogenic composition comprising a viral vector or a~~

~~lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 109, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 109.~~

~~388. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 105 or 206, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 105 or 206, respectively; and~~
- ~~2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 107 or 207, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 107 or 207, respectively.~~

~~389. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 105, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 105; and a second viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide, comprising SEQ ID NO: 107, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 107.~~

~~390. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide~~

encoding a first fusion polypeptide comprising SEQ ID NO: 206, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 206; and a second viral vector or a lipoplex (*e.g.*, LNP) comprising a polynucleotide encoding a second fusion polypeptide, comprising SEQ ID NO: 207, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 207.

391. — The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:

- 1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (*e.g.*, LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 208, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 208; and
- 2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (*e.g.*, LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 209 or SEQ ID NO: 227, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 209 or SEQ ID NO: 227.

392. — The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:

- 1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (*e.g.*, LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 222, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222; and
- 2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (*e.g.*, LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 209 or SEQ ID NO: 227, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%,

~~85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 209 or SEQ ID NO: 227.~~

~~393.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 222, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222; and~~
- ~~2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 223, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 223.~~

~~394.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 208, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 208; and a second viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide, comprising SEQ ID NO: 209 or SEQ ID NO: 227, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 209 or SEQ ID NO: 227.~~

~~395.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 222, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222; and a second viral~~

~~vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide, comprising SEQ ID NO: 209 or SEQ ID NO: 227, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 209 or SEQ ID NO: 227.~~

~~396.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 222, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 222; and a second viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide, comprising SEQ ID NO: 223, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 223.~~

~~397.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 96 and 97, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 96 and 97, respectively; and~~
- ~~2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides, optionally joined or connected by one or more linkers, comprising SEQ ID NOs: 100 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 100 and 101, respectively.~~

~~398. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 107, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 107; and~~
- ~~2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 111, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 111.~~

~~399. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 200, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 200; and~~
- ~~2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 201, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 201.~~

~~400. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 200, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%,~~

~~93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 200; and a second viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide, comprising SEQ ID NO: 201, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 201.~~

~~401.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 202, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 202; and~~
- ~~2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 203, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 203.~~

~~402.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 202, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 202; and a second viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide, comprising SEQ ID NO: 203, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 203.~~

~~403.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising a viral vector or a~~

~~lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 204, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 204; and~~

- ~~2) Boosting with an immunogenic composition comprising a viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a compound fusion polypeptide comprising SEQ ID NO: 205, or a compound fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 205.~~

~~404. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a first fusion polypeptide comprising SEQ ID NO: 204, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 204; and a second viral vector or a lipoplex (e.g., LNP) comprising a polynucleotide encoding a second fusion polypeptide, comprising SEQ ID NO: 205, or a fusion polypeptide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 205.~~

~~405. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~
- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 82 and 83, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 83, respectively; and~~

2) ~~Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 88 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 88 and 89, respectively.~~

1) ~~Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

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~~90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively; and~~

~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively; and~~

~~2) Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) a first viral vector comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 84 and 88, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 84 and 88, respectively; and~~

~~b) a second viral vector comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 85 and 89, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 89, respectively.~~

~~407. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

~~1) Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 82 and 86, or fusion polypeptides~~

~~that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively; and~~

~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively; and~~

~~2) Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively; and~~

~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.~~

~~408. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

~~1) Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion~~

polypeptides comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively; and

b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively; and~~

2) ~~Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~

a) ~~a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively; and~~

b) ~~a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively.~~

409. ~~The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~
 - ~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively; and~~
 - ~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively; and~~
- ~~2) Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~
 - ~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively; and~~
 - ~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively.~~

410. ~~The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~
 - ~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively; and~~
 - ~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively; and~~
- ~~2) Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:~~
 - ~~a) a first viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively; and~~
 - ~~b) a second viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively.~~

~~411.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising a viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 90 and 91, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 90 and 91, respectively; and~~
- ~~2) Boosting with an immunogenic composition comprising a viral vector or lipoplex (e.g., LNP) comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers: SEQ ID NOs: 92 and 93, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 92 and 93, respectively.~~

~~412.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following polynucleotides:~~
 - ~~a) a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 131 and 135, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 131 and 135, respectively; and~~
 - ~~b) a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 133 and 137, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 133 and 137, respectively; and~~

~~2) Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following polynucleotides:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 139 and 145, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 145, respectively; and~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 142 and 148, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 142 and 148, respectively.~~

~~413. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

~~1) Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following polynucleotides:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 140 and 146, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively; and~~
- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 143 and 149, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively; and~~

~~2) Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following polynucleotides:~~

- ~~a) a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or that are at least~~

~~80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively; and~~

- ~~b) a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, respectively.~~

~~414. The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following polynucleotides:
 - ~~a) a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively; and~~
 - ~~b) a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, respectively; and~~~~
- ~~2) Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following polynucleotides:
 - ~~a) a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 140 and 146, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively; and~~~~

b) ~~a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 143 and 149, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively.~~

415. ~~The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

1) ~~Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following polynucleotides:~~

a) ~~a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively; and~~

b) ~~a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 155 and 158, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 155 and 158, respectively; and~~

2) ~~Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following polynucleotides:~~

a) ~~a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 151 and 153, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 151 and 153, respectively; and~~

b) ~~a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 156 and 159, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 156 and 159, respectively.~~

~~416.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following polynucleotides:
 - a) a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively; and
 - b) a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 155 and 158, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 155 and 158, respectively; and~~
- ~~2) Boosting with an immunogenic composition comprising first and second viral vectors, or first and second lipoplexes (e.g., LNPs), comprising the following polynucleotides:
 - a) a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 139 and 145, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139 and 145, respectively; and
 - b) a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 142 and 148, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 142 and 148, respectively.~~

~~417.—The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- ~~1) Priming with an immunogenic composition comprising a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 160 and 161, or polynucleotides that are at least 80%, 81%, 82%,~~

~~83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 160 and 161, respectively; and~~

- 2) ~~Boosting with an immunogenic composition comprising a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 162 and 163, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 162 and 163, respectively.~~

418. ~~The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises:~~

- 1) ~~Priming with an immunogenic composition comprising a first viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 164 and 165, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 164 and 165, respectively; and~~
- 2) ~~Boosting with an immunogenic composition comprising a second viral vector or lipoplex (e.g., LNP) comprising first and second polynucleotides comprising SEQ ID NOs: 166 and 167, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 166 and 167, respectively.~~

419. ~~The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or lipoplex (e.g., LNP) comprising a first polynucleotide comprising SEQ ID NO: 210, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 210; and a second viral vector or lipoplex (e.g., LNP) comprising a second polynucleotide comprising SEQ ID NO: 211, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 211.~~

420. ~~The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition~~

comprising a first viral vector or lipoplex (*e.g.*, LNP) comprising a first polynucleotide comprising ~~SEQ ID NO: 212, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 212;~~ and a second viral vector or lipoplex (*e.g.*, LNP) comprising a second polynucleotide comprising ~~SEQ ID NO: 213, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 213.~~

421. — The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or lipoplex (*e.g.*, LNP) comprising a first polynucleotide comprising ~~SEQ ID NO: 214, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 214;~~ and a second viral vector or lipoplex (*e.g.*, LNP) comprising a second polynucleotide comprising ~~SEQ ID NO: 215, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 215.~~

422. — The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or lipoplex (*e.g.*, LNP) comprising a first polynucleotide comprising ~~SEQ ID NO: 216, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 216;~~ and a second viral vector or lipoplex (*e.g.*, LNP) comprising a second polynucleotide comprising ~~SEQ ID NO: 217, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 217.~~

423. — The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or lipoplex (*e.g.*, LNP) comprising a first polynucleotide comprising ~~SEQ ID NO: 218, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 218;~~ and a second viral vector or lipoplex (*e.g.*, LNP) comprising a second polynucleotide comprising ~~SEQ ID NO: 219, or a polynucleotide that~~

is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 219.

424. — The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or lipoplex (*e.g.*, LNP) comprising a first polynucleotide comprising SEQ ID NO: 218, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 218; and a second viral vector or lipoplex (*e.g.*, LNP) comprising a second polynucleotide comprising SEQ ID NO: 226, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 226.

425. — The method of any one of claims 364 to 373, wherein the prime-boost regimen comprises: priming and boosting with an immunogenic composition comprising a first viral vector or lipoplex (*e.g.*, LNP) comprising a first polynucleotide comprising SEQ ID NO: 225, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 225; and a second viral vector or lipoplex (*e.g.*, LNP) comprising a second polynucleotide comprising SEQ ID NO: 226, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 226.

426. — The method of any one of claims 364 to 425, wherein the viral vectors in the priming composition are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors and the viral vectors in the boosting composition are Cali mammarenavirus (*a.k.a.* Pichinde mammarenavirus or Pichinde arenavirus) viral vectors.

427. — The method of any one of claims 364 to 425, wherein the viral vectors in the priming composition are Cali mammarenavirus (*a.k.a.* Pichinde mammarenavirus or Pichinde arenavirus) viral vectors and the viral vectors in the boosting composition are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.

428. — The method of any one of claims 364 to 425, wherein the viral vectors in the priming composition and the viral vectors in the boosting composition are adenoviral vectors, *e.g.*, chimpanzee adenoviral vectors (ChAds).

~~429.—The method of any one of claims 374 to 428, wherein the viral vectors in the priming composition and the viral vectors in the boosting composition are replication deficient.~~

~~430.—The method of any one of claims 374 to 428, wherein the viral vectors in the priming composition and the viral vectors in the boosting composition are replication attenuated.~~

~~431.—The method of any one of claims 312 to 430, wherein the subject is not receiving antiretroviral therapy (ART) or ART is discontinued prior to administration of the one or more compositions.~~

~~432.—The method of any one of claims 312 to 431, wherein ART is discontinued after one or more administrations of the compositions.~~

~~433.—The method of any one of claims 312 to 432, further comprising administering to the subject one or more additional therapeutic agents, e.g. two, three, four, or more additional therapeutic agents.~~

~~434.—The method of claim 433, comprising co-administering one or more agents that activate latent HIV, e.g., one or more latency reversing agents (LRAs).~~

~~435.—The method of any one of claims 433 to 434, wherein the one or more LRAs are selected from agonists or activators of one or more toll-like receptors (TLRs), histone deacetylase (HDAC) inhibitors, proteasome inhibitors, protein kinase C (PKC) activators, Smyd2 inhibitors, BET bromodomain 4 (BRD4) inhibitors, ionomycin, inhibitor of apoptosis proteins (IAP) antagonists, and second mitochondria derived activator of caspases (SMAC) mimetics.~~

~~436.—The method of any one of claims 433 to 435, comprising co-administering one or more agonists or activators of one or more toll-like receptors (TLRs).~~

~~437.—The method of claim 436, wherein the TLR agonist or activator is selected from a TLR2 agonist, a TLR3 agonist, a TLR4 agonist, a TLR5 agonist, a TLR7 agonist, a TLR8 agonist and a TLR9 agonist.~~

~~438.—The method of any one of claims 436 to 437, wherein the TLR7 agonist is selected from GS-9620 (vesatolimod), R848 (Resiquimod), DS-0509, LHC-165~~

and TMX-101 (imiquimod), and/or wherein the TLR8 agonist is selected from GS-9688 (Selgantolimod), R848 (Resiquimod) and NKTR-262 (dual TLR7/TLR8 agonist).

439. — ~~The method of any one of claims 433 to 438, comprising co-administering one or more interleukin receptor agonists of an interleukin selected from IL-2, IL-7, IL-12 and IL-15.~~

440. — ~~The method of claim 439, comprising co-administering one or more cytokines selected from IL-2, IL-7, IL-12, IL-15, and variants thereof.~~

441. — ~~The method of any one of claims 433 to 440, comprising co-administering one or more innate immune activators.~~

442. — ~~The method of claim 441, wherein the one or more innate immune activators comprises an agonist of a receptor selected from fms related tyrosine kinase 3 (FLT3), stimulator of interferon genes (STING) receptor, DExD/H box helicase 58 (DDX58; *a.k.a.*, RIG-I), nucleotide binding oligomerization domain containing 2 (NOD2).~~

443. — ~~The method of any one of claims 433 to 442, comprising co-administering an agonist of fms related tyrosine kinase 3 (FLT3).~~

444. — ~~The method of claim 443, wherein the vaccine-induced T cell response is increased in comparison to administration of the immunogenic composition alone.~~

445. — ~~The method of any one of claims 433 to 444, comprising co-administering one or more antagonists or inhibitors of an inhibitory immune checkpoint protein or receptor and/or one or more activators or agonists of a stimulatory immune checkpoint protein or receptor.~~

446. — ~~The method of claim 445, wherein the one or more immune checkpoint proteins or receptors are selected from: CD27, CD70; CD40, CD40LG; CD47, CD48 (SLAMF2), transmembrane and immunoglobulin domain containing 2 (TMIGD2, CD28H), CD84 (LY9B, SLAMF5), CD96, CD160, MS4A1 (CD20), CD244 (SLAMF4); CD276 (B7H3); V-set domain containing T cell activation inhibitor 1 (VTCN1, B7H4); V-set immunoregulatory receptor (VSIR, B7H5, VISTA); immunoglobulin superfamily member 11 (IGSF11, VSIG3); natural killer cell cytotoxicity receptor 3 ligand 1~~

(NCR3LG1, B7H6); HERV H LTR associating 2 (HHLA2, B7H7); inducible T cell co-stimulator (ICOS, CD278); inducible T cell costimulator ligand (ICOSLG, B7H2); TNF receptor superfamily member 4 (TNFRSF4, OX40); TNF superfamily member 4 (TNFSF4, OX40L); TNFRSF8 (CD30), TNFSF8 (CD30L); TNFRSF10A (CD261, DR4, TRAILR1); TNFRSF9 (CD137), TNFSF9 (CD137L); TNFRSF10B (CD262, DR5, TRAILR2); TNFRSF10 (TRAIL); TNFRSF14 (HVEM, CD270), TNFSF14 (HVEML); CD272 (B and T lymphocyte associated (BTLA)); TNFRSF17 (BCMA, CD269), TNFSF13B (BAFF); TNFRSF18 (GITR), TNFSF18 (GITRL); MHC class I polypeptide related sequence A (MICA); MHC class I polypeptide related sequence B (MICB); CD274 (CD274, PDL1, PD-L1); programmed cell death 1 (PDCD1, PD1, PD-1); cytotoxic T lymphocyte associated protein 4 (CTLA4, CD152); CD80 (B7-1), CD28; nectin cell adhesion molecule 2 (NECTIN2, CD112); CD226 (DNAM-1); Poliovirus receptor (PVR) cell adhesion molecule (PVR, CD155); PVR-related immunoglobulin domain containing (PVRIG, CD112R); T cell immunoreceptor with Ig and ITIM domains (TIGIT); T cell immunoglobulin and mucin domain containing 4 (TIMD4; TIM4); hepatitis A virus cellular receptor 2 (HAVCR2, TIMD3, TIM3); galectin 9 (LGALS9); lymphocyte activating 3 (LAG3, CD223); signaling lymphocytic activation molecule family member 1 (SLAMF1, SLAM, CD150); lymphocyte antigen 9 (LY9, CD229, SLAMF3); SLAM family member 6 (SLAMF6, CD352); SLAM family member 7 (SLAMF7, CD319); UL16 binding protein 1 (ULBP1); UL16 binding protein 2 (ULBP2); UL16 binding protein 3 (ULBP3); retinoic acid-early transcript 1E (RAET1E; ULBP4); retinoic acid-early transcript 1G (RAET1G; ULBP5); retinoic acid-early transcript 1L (RAET1L; ULBP6); lymphocyte activating 3 (CD223); killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR, CD158E1); killer cell lectin like receptor C1 (KLRC1, NKG2A, CD159A); killer cell lectin like receptor K1 (KLRK1, NKG2D, CD314); killer cell lectin like receptor C2 (KLRC2, CD159c, NKG2C); killer cell lectin like receptor C3 (KLRC3, NKG2E); killer cell lectin like receptor C4 (KLRC4, NKG2F); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 1 (KIR2DL1); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 2 (KIR2DL2); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 3 (KIR2DL3); killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR3DL1); killer cell lectin like receptor D1 (KLRD1); and SLAM family member 7 (SLAMF7).

447.—The method of any one of claims 445 to 446, comprising co-administering one or more blockers or inhibitors of one or more T cell inhibitory immune checkpoint proteins or receptors.

448.— The method of claim 447, wherein the T cell inhibitory immune checkpoint proteins or receptors are selected from CD274 (CD274, PDL1, PD-L1); programmed cell death 1 ligand 2 (PDCD1LG2, PD-L2, CD273); programmed cell death 1 (PDCD1, PD1, PD-1); cytotoxic T lymphocyte associated protein 4 (CTLA4, CD152); CD276 (B7H3); V-set domain containing T cell activation inhibitor 1 (VTCN1, B7H4); V-set immunoregulatory receptor (VSIR, B7H5, VISTA); immunoglobulin superfamily member 11 (IGSF11, VSIG3); TNFRSF14 (HVEM, CD270), TNFRSF14 (HVEM); CD272 (B and T lymphocyte associated (BTLA)); PVR-related immunoglobulin domain containing (PVRIG, CD112R); T cell immunoreceptor with Ig and ITIM domains (TIGIT); lymphocyte activating 3 (LAG3, CD223); hepatitis A virus cellular receptor 2 (HAVCR2, TIMD3, TIM3); galectin 9 (LGALS9); killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR, CD158E1); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 1 (KIR2DL1); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 2 (KIR2DL2); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 3 (KIR2DL3); and killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR3DL1).

449.— The method of any one of claims 445 to 446, comprising co-administering one or more agonists or activators of one or more T cell stimulatory immune checkpoint proteins or receptors.

450.— The method of claim 449, wherein the T cell stimulatory immune checkpoint proteins or receptors are selected from CD27, CD70; CD40, CD40LG; inducible T cell costimulator (ICOS, CD278); inducible T cell costimulator ligand (ICOSLG, B7H2); TNF receptor superfamily member 4 (TNFRSF4, OX40); TNF superfamily member 4 (TNFSF4, OX40L); TNFRSF9 (CD137), TNFSF9 (CD137L); TNFRSF18 (GITR), TNFSF18 (GITRL); CD80 (B7-1), CD28; nectin cell adhesion molecule 2 (NECTIN2, CD112); CD226 (DNAM-1); Poliovirus receptor (PVR)-cell adhesion molecule (PVR, CD155).

451.—The method of any one of claims 445 to 446, comprising co-administering one or more blockers or inhibitors of one or more NK cell inhibitory immune checkpoint proteins or receptors.

452.—The method claim 451, wherein the NK cell inhibitory immune checkpoint proteins or receptors are selected from killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR, CD158E1); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 1 (KIR2DL1); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 2 (KIR2DL2); killer cell immunoglobulin like receptor, two Ig domains and long cytoplasmic tail 3 (KIR2DL3); killer cell immunoglobulin like receptor, three Ig domains and long cytoplasmic tail 1 (KIR3DL1); killer cell lectin like receptor C1 (KLRC1, NKG2A, CD159A); and killer cell lectin like receptor D1 (KLRD1, CD94).

453.—The method of any one of claims 445 to 446, comprising co-administering one or more agonists or activators of one or more NK cell stimulatory immune checkpoint proteins or receptors.

454.—The method of claim 453, wherein the NK cell stimulatory immune checkpoint proteins or receptors are selected from CD16, CD226 (DNAM 1); killer cell lectin like receptor K1 (KLRK1, NKG2D, CD314); and SLAM family member 7 (SLAMF7).

455.—The method of any one of claims 445 to 448, wherein the one or more immune checkpoint inhibitors comprises a proteinaceous inhibitor of PD-L1 (CD274), PD-1 (PDCD1) or CTLA4.

456.—The method of claim 455, comprising co-administering an antibody that binds to CTLA4.

457.—The method of claim 456, wherein the vaccine induced T cell response is increased in comparison to administration of the immunogenic composition alone.

458.—The method of any one of claims 455 to 457, wherein the proteinaceous or antibody inhibitor of CTLA4 is selected from ipilimumab, tremelimumab, BMS 986218, AGEN1181, AGEN1884, BMS 986249, MK 1308, REGN 4659, ADU

~~1604, CS 1002, BCD 145, APL 509, JS 007, BA 3071, ONC 392, AGEN 2041, JHL 1155, KN 044, CG 0161, ATOR 1144, PBI 5D3H5, FPT 155 (CTLA4/PD L1/CD28), PF 06936308 (PD 1/CTLA4), MGD 019 (PD 1/CTLA4), KN 046 (PD 1/CTLA4), MEDI 5752 (CTLA4/PD 1), XmAb 20717 (PD 1/CTLA4) and AK 104 (CTLA4/PD 1).~~

459. — ~~The method of claim 455, wherein the proteinaceous inhibitor of PD-L1 (CD274) or PD-1 (PDCD1) is selected from pembrolizumab, nivolumab, cemiplimab, pidilizumab, AMP 224, MEDI0680 (AMP 514), spartalizumab, atezolizumab, avelumab, durvalumab, BMS 936559, CK 301, PF 06801591, BGB A317 (tislelizumab), GLS 010 (WBP 3055), AK 103 (HX 008), AK 105, CS 1003, HLX 10, MGA 012, BI 754091, AGEN 2034, JS 001 (toripalimab), JNJ 63723283, genolimzumab (CBT 501), LZM 009, BCD 100, LY 3300054, SHR 1201, SHR 1210 (camrelizumab), Sym 021, ABBV 181, PD1 PIK, BAT 1306, (MSB0010718C), CX 072, CBT 502, TSR 042 (dostarlimab), MSB 2311, JTX 4014, BGB A333, SHR 1316, CS 1001 (WBP 3155, KN 035, IBI 308 (sintilimab), HLX 20, KL A167, STI A1014, STI A1015 (IMC 001), BCD 135, FAZ 053, TQB 2450, MDX1105 01, FPT 155 (CTLA4/PD L1/CD28), PF 06936308 (PD 1/CTLA4), MGD 013 (PD 1/LAG 3), FS 118 (LAG 3/PD L1) MGD 019 (PD 1/CTLA4), KN 046 (PD 1/CTLA4), MEDI 5752 (CTLA4/PD 1), RO 7121661 (PD 1/TIM 3), XmAb 20717 (PD 1/CTLA4), AK 104 (CTLA4/PD 1), M7824 (PD L1/TGF β EC domain), CA 170 (PD L1/VISTA), CDX 527 (CD27/PD L1), LY 3415244 (TIM3/PDL1), and INBRX 105 (4 1BB/PDL1).~~

460. — ~~The method of any one of claims 445 to 448, wherein the one or more immune checkpoint inhibitors comprises a small molecule inhibitor of CD274 (PDL1, PD-L1), programmed cell death 1 (PDCD1, PD1, PD-1) or CTLA4.~~

461. — ~~The method of claim 460, wherein the small molecule inhibitor of CD274 or PDCD1 is selected from GS 4224, GS 4416, INCB086550 and MAX10181.~~

462. — ~~The method of claim 460, wherein the small molecule inhibitor of CTLA4 comprises BPI 002.~~

463. — ~~The method of any one of claims 433 to 462, further comprising administering to the subject one or more antiviral agents.~~

464.—~~The method of claim 463, wherein the one or more antiviral agents are selected from HIV protease inhibitors, HIV reverse transcriptase inhibitors, HIV integrase inhibitors, HIV non-catalytic site (or allosteric) integrase inhibitors, HIV entry (fusion) inhibitors, HIV maturation inhibitors and capsid inhibitors.~~

465.—~~The method of any one of claims 433 to 464, further comprising administering to the subject one or more anti-HIV antibodies or antigen-binding fragments thereof.~~

466.—~~The method of claim 465, wherein the one or more anti-HIV antibodies or antigen-binding fragments thereof binds to HIV gp120.~~

467.—~~The method of any one of claims 465 to 466, wherein the anti-HIV antibody or antigen-binding fragment thereof comprises a broadly neutralizing antibody.~~

468.—~~The method of any one of claims 465 to 467, wherein the one or more anti-HIV antibodies or antigen-binding fragments thereof that bind, inhibit, and/or neutralize HIV, compete with or comprise VH and VL variable domains of a broadly neutralizing antibody (bNAbs) against HIV.~~

469.—~~The method of any one of claims 465 to 468, wherein the one or more anti-HIV antibodies or antigen-binding fragments thereof that bind, inhibit, and/or neutralize HIV, bind to an epitope or region of gp120 selected from:~~

- ~~i.—third variable loop (V3) and/or high mannose patch comprising a N332 oligomannose glycan;~~
- ~~ii.—CD4 binding site (CD4bs);~~
- ~~iii.—second variable loop (V2) and/or Env trimer apex;~~
- ~~iv.—gp120/gp41 interface; or~~
- ~~v.—silent face of gp120.~~

470.—~~The method of any one of claims 465 to 469, wherein the antibody or antigen-binding fragment thereof that binds, inhibits, and/or neutralizes HIV, binds to an epitope or region of gp120 in the third variable loop (V3) and/or high mannose patch comprising a N332 oligomannose glycan and competes with or comprises VH and VL regions from an antibody selected from GS 9722, PGT 121, PGT 121.414, PGT 122, PGT 123, PGT 124, PGT 125, PGT 126, PGT 128, PGT 130, PGT 133, PGT 134, PGT 135,~~

~~PGT 136, PGT 137, PGT 138, PGT 139, 10-1074, 10-1074 J, GS 2872, VRC24, 2G12, BG18, 354BG8, 354BG18, 354BG42, 354BG33, 354BG129, 354BG188, 354BG411, 354BG426, DH270.1, DH270.6, PGDM12, VRC41.01, PGDM21, PCDN 33A, BF520.1 and VRC29.03.~~

471.—~~The method of any one of claims 465 to 470, wherein the antibody or antigen-binding fragment thereof binds to an epitope or region of gp120 in the CD4 binding site (CD4bs) and competes with or comprises VH and VL regions from an antibody selected from b12, F105, VRC01, VRC07, VRC07-523, VRC03, VRC06, VRC06b01, VRC08, VRC0801, NIH45-46, GS 9723, GS 5423, 3BNC117, 3BNC60, VRC-PG04, PGV04; CH103, 44-VRC13.01, 1NC9, 12A12, N6, N49-P7, NC-Cow1, IOMA, CH235 and CH235.12, N49P6, N49P7, N49P11, N49P9 and N60P25.~~

472.—~~The method of any one of claims 465 to 471, wherein the antibody or antigen-binding fragment thereof that binds, inhibits, and/or neutralizes HIV, binds to an epitope or region of gp120 in the second variable loop (V2) and/or Env trimer apex and competes with or comprises VH and VL regions from an antibody selected from PG9, PG16, PGC14, PGG14, PGT 142, PGT 143, PGT 144, PGT 145, CH01, CH59, PGDM1400, CAP256, CAP256-VRC26.08, CAP256-VRC26.09, CAP256-VRC26.25, PCT64-24E and VRC38.01.~~

473.—~~The method of any one of claims 465 to 472, wherein the antibody or antigen-binding fragment binds to an epitope or region of gp120 in the gp120/gp41 interface and competes with or comprises VH and VL regions from an antibody selected from PGT-151, CAP248-2B, 35O22, 8ANC195, ACS202, VRC34 and VRC34.01.~~

474.—~~The method of any one of claims 465 to 473, wherein the antibody or antigen-binding fragment thereof that binds, inhibits, and/or neutralizes HIV, binds to an epitope or region of the gp120 silent face and competes with or comprises VH and VL regions from antibody selected from VRC-PG05 and SF12.~~

475.—~~The method of any one of claims 465 to 474, wherein the antibody or antigen-binding fragment thereof that binds, inhibits, and/or neutralizes HIV, binds to an epitope or region of gp41 in the membrane proximal region (MPER).~~

476.—The method of any one of claims 465 to 475, wherein the antibody or antigen-binding fragment thereof that binds, inhibits, and/or neutralizes HIV, binds to an epitope or region of gp41 in the membrane proximal region (MPER) and competes with or comprises VH and VL regions from an antibody selected from 10E8, 10E8v4, 10E8 5R-100cF, 4E10, DH511.11P, 2F5, 7b2, and LN01.

477.—The method of any one of claims 465 to 476, wherein the antibody or antigen-binding fragment thereof that binds, inhibits, and/or neutralizes HIV, binds to an epitope or region of the gp41 fusion peptide and competes with or comprises VH and VL regions from an antibody selected from VRC34 and ACS202.

478.—The method of any one of claims 312 to 477, wherein, after one or more administrations of the one or more fusion polypeptides, compound fusion polypeptides, polynucleotides, vectors, lipoplexes (*e.g.*, LNPS) or immunogenic compositions, optionally in combination with one or more additional therapeutic agents, the subject does not exhibit symptoms of HIV or AIDS in the absence of anti-retroviral treatment (ART) for at least 3 months, at least 6 months, at least 1 year, at least 2 years, at least 3 years, or more.

479.—The method of any one of claims 312 to 478, wherein, after one or more administrations of the one or more fusion polypeptides, compound fusion polypeptides, polynucleotides, vectors, lipoplexes (*e.g.*, LNPS) or immunogenic compositions, optionally in combination with one or more additional therapeutic agents, the subject has a viral load copies/ml blood of less than 500, *e.g.* less than 400, less than 300, less than 200, less than 100, less than 50, in the absence of anti-retroviral treatment (ART) for at least 3 months, at least 6 months, at least 1 year, at least 2 years, at least 3 years, or more.

480.—A method of designing a fusion polypeptide that is capable of eliciting an immune response against one or more viral target antigens, the method comprising:

- a) identifying *in-silico* one or more regions of sequence conservation in a population of polypeptide sequences encoded by a viral gene, the population from an interpatient virus population;

- b) ~~identifying *in silico* the two most prevalent polypeptide sequences from the one or more conserved regions identified in step a), and generating multivalent polypeptide segments from the conserved regions; and~~
- c) ~~arranging the polypeptide segments to reduce or avoid the creation of deleterious epitopes at junctions between polypeptide segments.~~

481. ~~The method of claim 480, wherein step (c) comprises reducing or eliminating junctional 9-mers that bind to a specific HLA allele with a predicted IC₅₀ value of less than about 1000 nM or having a percentile rank within the top 5% in a population of polypeptide segments.~~

482. ~~A method of designing a fusion polypeptide that is capable of eliciting an immune response against one or more viral target antigens, the method comprising:~~

- a) ~~identifying *in silico* one or more regions of sequence conservation in a first population of polypeptide sequences encoded by a viral gene, the first population from an interpatient virus population;~~
- b) ~~optionally, identifying *in silico* the two most prevalent polypeptide sequences from the one or more conserved regions identified in step a); and~~
- c) ~~arranging the retained polypeptide segments into one or more contiguous fusion polypeptides, such that the junctions connecting the polypeptide segments avoid or reduce creating epitopes capable of binding human MHC class I or human MHC class II molecules, *e.g.*, with a predicted binding affinity IC₅₀ value of less than about 1000 nM or having a percentile rank within the top 5% in a population of polypeptide segments.~~

483. ~~The method of any one of claims 480 to 482, wherein step (c) comprises reducing or eliminating viral polypeptide 9-mers that have at least 55% (5 of 9 amino acid residues), *e.g.*, at least 65% (6 of 9 amino acid residues), *e.g.*, at least 75% (7 of 9 amino acid residues), *e.g.*, at least 85% (8 of 9 amino acid residues), amino acid sequence identity to a human protein.~~

~~484.—The method of any one of claims 480 to 483, wherein the multivalent polypeptide segments are bivalent polypeptide segments.~~

~~485.—The method of any one of claims 480 to 484, further comprising the step of identifying variant subsequences within one or more regions of sequence conservation in an inpatient population of polypeptide sequences encoded by a viral gene, e.g., using deep sequencing data.~~

~~486.—The method of claim 485, further comprising the step of identifying conserved regions of a polypeptide encoded by a viral gene, such that at least 70% of the variant subsequences within the one or more regions of sequence conservation in the inpatient population are within the bivalent polypeptide segments.~~

~~487.—The method of any one of claims 480 to 486, further comprising the step of shortening the length of the fusion polypeptide, e.g., by at least 10%, 15%, 20%, 25%, 30%, or more, retaining polypeptide segment subsequences comprising epitopes (i) predicted *in silico*, and (ii) confirmed *in vitro*.~~

~~488.—A method for producing a multivalent antigen, the method comprising constructing, *in silico*, a set of multivalent amino acid sequences within structurally conserved regions of a population of viral proteome sequences by a method comprising~~

~~(a) aligning the population of viral proteome sequences;~~

~~(b) creating, for each sequence in the alignment, a set of 9 amino acid subsequences (“9 mers”) starting with the N terminal amino acid, each subsequence overlapping the preceding subsequence by eight amino acids such that each sequence of length l in the alignment contains $(l - 8)$ 9 mers;~~

~~(c) calculating a frequency for each unique 9 mer starting at a position i in each sequence of the alignment and identifying the two or more most common unique 9 mers at each position;~~

~~———(c)(1) wherein frequency is calculated as the number of times the unique 9 mer occurs at position i in the alignment divided by the total number of sequences in the alignment;~~

(d) calculating a multivalent conservation for each position by summing the proportion of sequences in the alignment containing either of the two or more most common unique 9-mers;

(e) creating an alignment of conserved regions by extracting the sequences in the alignment having a multivalent conservation of greater than 80% or greater than 90%;

(f) determining a frequency for each pair of unique 9-mers at each position in the alignment of conserved regions;

(g) connecting 9-mer pairs in adjacent positions of the alignment of conserved regions that share an overlap of eight amino acids;

(h) creating a directed acyclic graph in which each 9-mer pair is a node and the edges between adjacent nodes are formed from the connected 9-mer pairs in the adjacent positions with the weight of each edge equal to the frequency of the downstream 9-mer pair;

- adding a source node and connecting it with all of the nodes in the first position;
- adding a sink node and connecting it with all of the nodes in the last position; and
- negating all of the weights;

(i) finding an optimal path in the directed acyclic graph from the source node to the sink node where the optimal path is defined in terms of the sum of the frequencies of all 9-mer pairs in the directed acyclic graph;

(j) building a multivalent antigen by connecting two or more 9-mers in adjacent positions within the optimal multivalent 9-mer path if they share an overlap of eight amino acids, thereby creating two or more sequences of connected 9-mers which together form the multivalent antigen; and

(k) optionally, rearranging the polypeptide segments to reduce or avoid the creation of deleterious epitopes at junctions between polypeptide segments.

489. — The method of claim 488, wherein the multivalent conservation is bivalent conservation and wherein the multivalent antigen is a bivalent antigen.

490. — The method of any one of claims 488 to 489, wherein in step (a) the conserved regions are further defined by performing one or more of the following steps:

(i) removing segments of fewer than 35 amino acids in length, *e.g.*, from 9 amino acids to 10, 15, 20, 25, 30 or 35 amino acids in length;

~~(ii) removing segments determined to have less than 90% multivalent (e.g., bivalent) conservation;~~

~~(iii) removing segments determined to be weakly immunogenic or non-immunogenic, e.g., as demonstrated in *in vitro* or *in vivo*; and/or~~

~~(iv) including additional segments determined to be immunogenic, e.g., as demonstrated in *in vitro* or *in vivo*.~~

491. — The method of any one of claims 488 to 490, wherein the step of rearranging the peptide segments to reduce or avoid creation of deleterious epitopes is performed by a method comprising one or more of *in silico* HLA binding analysis and human proteome cross-recognition analysis.

492. — The method of any one of claims 488 to 491, further comprising inserting a linker sequence between one or more adjacent segments.

493. — The method of any one of claims 488 to 492, wherein the method further comprises improving the multivalent (e.g., bivalent) antigen produced in step (h) by removing junctional 9-mers that bind to a specific HLA allele with a predicted IC₅₀ value of less than about 1000 nM or having a percentile rank within the top 5% in a population of polypeptide segments.

494. — The method of any one of claims 488 to 493, wherein the method further comprises improving the multivalent (e.g., bivalent) antigen produced in step (h) by removing 9-mers that have at least 55% (5 of 9 amino acid residues), e.g., at least 65% (6 of 9 amino acid residues), e.g., at least 75% (7 of 9 amino acid residues), e.g., at least 85% (8 of 9 amino acid residues), amino acid sequence identity with human peptides or that have the same T cell receptor (TCR) facing residues with human proteins.

495. — The method of any one of claims 488 to 494, further comprising rearranging the polypeptide segments to reduce or avoid the creation of deleterious epitopes at junctions between polypeptide segments.

496. — The method of claim 495, wherein the step of rearranging the peptide segments to reduce or avoid creation of deleterious epitopes is performed by a method comprising one or more of *in silico* HLA binding analysis and human proteome cross-recognition analysis.

~~497.—The method of any one of claims 488 to 496, further comprising the step of identifying variant subsequences within one or more regions of sequence conservation in an inpatient population of polypeptide sequences encoded by a viral gene, e.g., using deep sequencing data.~~

~~498.—The method of claim 497, further comprising the step of identifying conserved regions of a polypeptide encoded by a viral gene, such that at least 70% of the variant subsequences within the one or more regions of sequence conservation in the inpatient population are within the bivalent polypeptide segments.~~

~~499.—The method of any one of claims 480 to 498, further comprising the step of shortening the length of the fusion polypeptide, e.g., by at least 10%, 15%, 20%, 25%, 30%, or more, retaining polypeptide segment subsequences comprising epitopes (i) predicted *in silico*, and (ii) confirmed *in vitro*.~~

~~500.—The method of any one of claims 480 to 499, wherein the one or more viral target antigens are from a mammalian virus, e.g., a human virus.~~

~~501.—The method of any one of claims 480 to 500, wherein the one or more viral target antigens are from a virus selected from human immunodeficiency virus (HIV), hepatitis B virus (HBV), human papillomavirus (HPV), herpes simplex virus (HSV), Ebola virus, Zika virus and Chikungunya virus.~~

~~502.—The method of any one of claims 480 to 501, wherein the interpatient virus population is from a population of patients who have not received antiretroviral therapy (ART).~~

~~503.—The method of any one of claims 480 to 501, wherein the interpatient virus population is from a population of patients who have received antiretroviral therapy (ART).~~

~~504.—A fusion polypeptide made according to the method of any one of claims 480 to 503, wherein the fusion polypeptide elicits an immune response against a virus in a mammal, e.g., a human.~~

1. A fusion polypeptide comprising or consisting of an amino acid sequence of any one of SEQ ID NOs: 82-83, 86-87, and 98-101, or an amino acid sequence

that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82-83, 86-87, and 98-101.

2. The fusion polypeptide claim 1, further comprising an N-terminal signal peptide or leader sequence.

3. The fusion polypeptide of claim 1 or 2, wherein the fusion polypeptide is capable of inducing, promoting or stimulating an immune response against HIV-1 in a human.

4. The fusion polypeptide of any one of claims 1 to 3, wherein fusion polypeptide is capable of inducing, promoting or stimulating proliferation and/or activation of one or more cell types selected from monocyte-derived dendritic cells (DCs), CD8+ T cells and CD4+ T cells.

5. A polynucleotide comprising a nucleic acid sequence encoding one or more fusion polypeptides of any one of claims 1 to 4.

6. The polynucleotide of claim 5, comprising a nucleic acid sequence of any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, and 158, or that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 139, 140, 142, 143, 145, 146, 148, 149, 150, 152, 155, and 158.

7. An expression cassette, comprising a polynucleotide of claim 5 or 6 operably linked to one or more regulatory sequences.

8. A vector comprising one or more polynucleotides of claim 5 or 6, or an expression cassette of claim 7.

9. The vector of claim 8, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide: SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively.

10. The vector of claim 8, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide: SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively.

11. The vector of claim 8 comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide: SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively.

12. The vector of claim 8, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide: SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.

13. The vector of any one of claims 8 to 12, comprising the following first polynucleotide and second polynucleotide:

- a) a first polynucleotide comprising SEQ ID NO: 140, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 140, respectively, and
- b) a second polynucleotide comprising SEQ ID NO: 146, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 146.

14. The vector of any one of claims 8 to 12, comprising the following first polynucleotide and second polynucleotide:

- a) a first polynucleotide comprising SEQ ID NO: 143, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 143, respectively, and

b) a second polynucleotide comprising SEQ ID NO: 149, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 149.

15. The vector of any one of claims 8 to 12, comprising the following first polynucleotide and second polynucleotide:

a) a first polynucleotide comprising SEQ ID NO: 150, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 150, respectively, and

b) a second polynucleotide comprising SEQ ID NO: 152, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 152.

16. The vector of any one of claims 8 to 12, comprising the following first polynucleotide and second polynucleotide:

a) a first polynucleotide comprising SEQ ID NO: 154, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 154, respectively, and

b) a second polynucleotide comprising SEQ ID NO: 157, or a polynucleotide that is at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to SEQ ID NO: 157.

17. The vector of any one of claims 8 to 16, wherein the vector is a viral vector.

18. The vector of claim 17, wherein the viral vector is replication defective, replication deficient, replication attenuated or replication competent.

19. The vector of claim 17 or 18, wherein the viral vector is an arenavirus vector selected from Lymphocytic choriomeningitis mammarenavirus (LCMV), Cali mammarenavirus (*a.k.a.*, Pichinde mammarenavirus or Pichinde arenavirus), Guanarito

virus (GTOV), Junin virus (JUNV), Lassa virus (LASV), Lujo virus (LUJV), Machupo virus (MACV), Sabia virus (SABV), and Whitewater Arroyo virus (WWAV).

20. The vector of claim 19, wherein the viral vector is an arenavirus vector selected from Lymphocytic choriomeningitis mammarenavirus (LCMV) or Cali mammarenavirus (a.k.a. Pichinde mammarenavirus or Pichinde arenavirus).

21. The vector of claim 19 or 20, wherein the arenavirus vector comprises a tri-segmented genome.

22. A host cell comprising one or more polynucleotides of claim 5, or one or more vectors of any one of claims 8 to 21.

23. An immunogenic composition comprising two or more of the fusion polypeptides of any one of claims 1 to 4, or two or more polynucleotides of claim 5, or two or more vectors of any one of claims 8 to 18, and a pharmaceutically acceptable carrier.

24. The immunogenic composition of claim 23, comprising first and second viral vectors comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:

a) a first polynucleotide or first viral vector comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively, and

b) a second polynucleotide or second viral vector comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively.

25. The immunogenic composition of claim 23, comprising first and second viral vectors comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:

a) a first polynucleotide or first viral vector comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide

comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively, and

b) a second polynucleotide or second viral vector comprising one or more polynucleotides encoding a first fusion polypeptide and a second fusion polypeptide comprising SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.

26. The immunogenic composition of claim 24 or 25, wherein the first and second viral vectors are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.

27. The immunogenic composition of claim 24 or 25, wherein the first and second viral vectors are Cali mammarenavirus (a.k.a. Pichinde mammarenavirus or Pichinde arenavirus) viral vectors.

28. The immunogenic composition of any one of claims 23 to 27, comprising first and second viral vectors comprising the following first polynucleotide and second polynucleotide:

a) a first vector comprising first and second polynucleotides comprising SEQ ID NOs: 140 and 146, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively, and

b) a second vector comprising first and second polynucleotides comprising SEQ ID NOs: 143 and 149, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively.

29. The immunogenic composition of claim 28, wherein the first and second viral vectors are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.

30. The immunogenic composition of any one of claims 23 to 27, comprising first and second viral vectors comprising the following first polynucleotide and second polynucleotide:

a) a first vector comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively, and

b) a second vector comprising first and second polynucleotides comprising SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, respectively.

31. The immunogenic composition of claim 30, wherein the first and second viral vectors are Cali mammarenavirus (*a.k.a.* Pichinde mammarenavirus or Pichinde arenavirus) viral vectors.

32. The immunogenic composition of any one of claims 23 to 31, formulated for administration via a route selected from intravenous, intramuscular, intradermal, subcutaneous, intranodal and mucosal (*e.g.* buccal, intranasal, intrarectal, intravaginal).

33. The immunogenic composition of any one of claims 23 to 32, formulated as a liquid, a suspension or an emulsion.

34. The immunogenic composition of any one of claims 23 to 32, wherein the composition is lyophilized.

35. A kit comprising one or more unitary doses of one or more of the fusion polypeptides of any one of claims 1 to 4, or one or more polynucleotides of claim 5, or one or more vectors of any one of claims 8 to 18, or one or more immunogenic compositions of any one of claims 23 to 34.

36. Use of the immunogenic composition of any one of claims 23 to 34 in the manufacture of a medicament for treating or preventing human immunodeficiency virus (HIV).

37. The use of claim 36, wherein the medicament comprises first and second viral vectors comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:

a) a first polynucleotide or first viral vector comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively, and

b) a second polynucleotide or second viral vector comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively.

38. The use of claim 36, wherein the medicament comprises first and second viral vectors comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide:

a) a first polynucleotide or first viral vector comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively, and

b) a second polynucleotide or second viral vector comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide comprising SEQ ID NOs: 85 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 85 and 101, respectively.

39. The use of claim 37 or 38, wherein the first and second viral vectors are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.

40. The use of claim 37 or 38, wherein the first and second viral vectors are Cali mammarenavirus (*a.k.a.* Pichinde mammarenavirus or Pichinde arenavirus) viral vectors.

41. The use of any one of claims 36 to 40, wherein the medicament comprises first and second viral vectors, comprising the following first polynucleotide and second polynucleotide:

- a) a first vector comprising first and second polynucleotides comprising SEQ ID NOs: 140 and 146, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively, and
- b) a second vector comprising first and second polynucleotides comprising SEQ ID NOs: 143 and 149, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively, wherein the first and second viral vectors are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.

42. The use of any one of claims 36 to 41, wherein the medicament comprises first and second viral vectors, comprising the following first polynucleotide and second polynucleotide:

- a) a first vector comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively, and
- b) a second vector comprising first and second polynucleotides comprising SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, respectively, wherein the first and second viral vectors are Cali mammarenavirus (*a.k.a.* Pichinde mammarenavirus or Pichinde arenavirus) viral vectors.

43. The use of any one of claims 36 to 42, wherein the subject is infected with HIV-1, is suspected of being infected with HIV-1, or is at risk of being infected with HIV-1.

44. The use of any one of claims 36 to 43, wherein the immunogenic composition is to be administered via a route selected from intravenous, intramuscular, intradermal, subcutaneous, intranodal and mucosal (e.g. buccal, intranasal, intrarectal, intravaginal).

45. The use of any one of claims 36 to 44, wherein the treating or preventing HIV comprises administering from about 10^3 to about 10^{12} viral focus forming units (FFU) or plaque forming units (PFU) or infectious units (IU) or viral particles (vp), e.g. from about 10^4 to about 10^7 viral FFU or PFU or IU or vp, e.g. from about 10^3 to about 10^4 , 10^5 , 10^6 , 10^7 , 10^8 , 10^9 , 10^{10} , 10^{11} , 10^{12} , 10^{13} , 10^{14} or 10^{15} viral FFU or PFU or IU or vp, per administration.

46. The use of any one of claims 36 to 45, wherein the treating or preventing HIV comprises a prime-boost regimen comprising administering a priming composition at a first time point and administering one or more boosting compositions at one or more subsequent time points.

47. The use of claim 46, wherein the prime-boost regimen comprises:
- 1) Priming with an immunogenic composition comprising first and second viral vectors, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:
 - a) a first viral vector comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 82 and 86, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 82 and 86, respectively; and
 - b) a second viral vector comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 83 and 87, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 83 and 87, respectively; and

- 2) Boosting with an immunogenic composition comprising first and second viral vectors, comprising one or more polynucleotides encoding the following first fusion polypeptide and second fusion polypeptide, optionally joined or connected by one or more linkers:
- a) a first viral vector comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 98 and 100, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 98 and 100, respectively; and
- b) a second viral vector comprising one or more polynucleotides encoding first fusion polypeptide and second fusion polypeptides comprising SEQ ID NOs: 99 and 101, or fusion polypeptides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 99 and 101, respectively.
48. The use of claim 46, wherein the prime-boost regimen comprises:
- 1) Priming with an immunogenic composition comprising first and second viral vectors, comprising the following polynucleotides:
- a) a first viral vector comprising first and second polynucleotides comprising SEQ ID NOs: 150 and 152, or polynucleotides that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 150 and 152, respectively; and
- b) a second viral vector comprising first and second polynucleotides comprising SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 154 and 157 or SEQ ID NOs: 155 and 158, respectively; and
- 2) Boosting with an immunogenic composition comprising first and second viral vectors, comprising the following polynucleotides:
- a) a first viral vector comprising first and second polynucleotides comprising SEQ ID NOs: 140 and 146, or that are at least 80%, 81%, 82%, 83%, 84%,

85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 140 and 146, respectively;
and

b) a second viral vector comprising first and second polynucleotides comprising SEQ ID NOs: 143 and 149, or that are at least 80%, 81%, 82%, 83%, 84%, 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% identical to any one of SEQ ID NOs: 143 and 149, respectively.

49. The use of claim 47 or 48, wherein the viral vectors in the priming composition are Cali mammarenavirus (a.k.a. Pichinde mammarenavirus or Pichinde arenavirus) viral vectors and the viral vectors in the boosting composition are Lymphocytic choriomeningitis mammarenavirus (LCMV) viral vectors.

50. The use of any one of claims 47 to 49, wherein the viral vectors in the priming composition and the viral vectors in the boosting composition are replication attenuated.