CLAIMS

1. A stabilized trimer comprising three gp140 polypeptides, wherein at least one of said gp140 polypeptides comprises an amino acid sequence having at least 90% identity to SEQ ID NO: 2.

2. The stabilized trimer of claim 1, wherein said at least one gp140 polypeptides comprises an amino acid sequence having at least 95% identity to, or the sequence of, SEQ ID NO: 2.

3. The stabilized trimer of claim 1 or 2, wherein two, or each, of said gp140 polypeptides comprises an amino acid sequence having at least 90% identity to, for example at least 95% identity to, or the sequence of, SEQ ID NO: 2.

4. A stabilized trimer comprising three gp140 polypeptides, wherein at least one of said gp140 polypeptides comprises an amino acid sequence having substantially the sequence of SEQ ID NO: 1, 3, 4, or 5.

5. The stabilized trimer of claim 4, wherein two, or each, of said gp140 polypeptides comprises an amino acid sequence having substantially the sequence of SEQ ID NO: 1, 3, 4, or 5.

6. A composition comprising the stabilized trimer of any one of claims 1 to 5.

7. The composition of claim 6, further comprising one or more different stabilized trimers.

8. The composition of claim 7, wherein said one or more different stabilized trimers comprises three gp140 polypeptides, wherein at least one, preferably two or each, of said gp140 polypeptides comprises an amino acid sequence having at least 90% identity to the sequence of any one of SEQ ID NOs: 1-5.

9. The composition of claim 8, wherein said one or more different stabilized trimers comprises three gp140 polypeptides, wherein at least one, preferably two or each, of said gp140 polypeptides comprises an amino acid sequence having at least 95% identity to, or the sequence of, any one of SEQ ID NOs: 1-5.

10. The composition of any one of claims 6 to 9, further comprising a pharmaceutically acceptable carrier, excipient, or diluent.

11. The composition of any one of claims 6 or 10, further comprising an adjuvant.

12. A vaccine comprising the composition of any one of claims 6 to 11.

13. The vaccine of claim 12, wherein said vaccine is capable of treating or reducing the risk of a human immunodeficiency virus (HIV) infection in a subject in need thereof.

14. The vaccine of claim 13, wherein said vaccine elicits production of neutralizing anti-HIV antisera after administration to said subject.

15. The vaccine of claim 14, wherein said anti-HIV antisera neutralizes HIV selected from any one or more of clade A, clade B, and clade C.

16. The vaccine of claim 15, wherein said subject is a human.

17. A nucleic acid molecule comprising a nucleotide sequence that encodes at least one gp140 polypeptide, wherein said gp140 polypeptide comprises:
    (a) an amino acid sequence having at least 95% identity to SEQ ID NO: 1; and/or
    (b) an amino acid sequence having at least 95% identity to SEQ ID NO: 2; and/or
    (c) an amino acid sequence having substantially the sequence of SEQ ID NO: 3; and/or
    (d) an amino acid sequence having at least 95% identity to SEQ ID NO: 4; and/or
    (e) an amino acid sequence having at least 95% identity to SEQ ID NO: 5, and/or combinations thereof.

18. A vector comprising one or more nucleic acid molecules of claim 17.

19. The vector of claim 18, wherein said vector is an adenovirus vector or a poxvirus vector.

20. The vector of claim 19, wherein said adenovirus is a recombinant adenovirus serotype 11 (Ad11), adenovirus serotype 15 (Ad15), adenovirus serotype 24 (Ad24), adenovirus serotype 26 (Ad26), adenovirus serotype 34 (Ad34), adenovirus serotype 35 (Ad35), adenovirus serotype 48 (Ad48), adenovirus serotype 49 (Ad49), adenovirus serotype 50 (Ad50), Pan9 (AdC68), or a chimeric variant thereof.

21. The vector of claim 19, wherein said poxvirus is a modified vaccinia virus Ankara (MVA).

22. A method of treating or reducing the risk of an HIV infection in a subject in need thereof comprising administering a therapeutically effective amount of the stabilized trimer of any one of claims 1-5, the composition of any one of claims 6-11, the vaccine of any one of claims 12-16, the nucleic acid molecule of claim 17, and/or the vector of any one of claims 18-21 to said subject.

23. A method of reducing an HIV-mediated activity in a subject infected with HIV comprising administering a therapeutically effective amount of the stabilized trimer of any one of claims 1-5, the composition of any one of claims 6-11, the vaccine of any one of claims 12-16, the nucleic acid molecule of claim 17, and/or the vector of any one of claims 18-21 to said subject.

24. The method of claim 23, wherein said HIV-mediated activity is viral spread, infection, or cell fusion.

25. The method of claim 24, wherein said cell fusion is target cell entry or syncytial formation.

26. The method of claim 23, wherein HIV titer in said subject infected with HIV is decreased after administration of said vaccine to said subject.

27. The method of any one of claims 22 to 26, wherein said vaccine is administered intramuscularly, intravenously, intradermally, percutaneously, intraarterially, intraperitoneally, intralesionally, intracranially, intraarticularly, intraprostatically, intrapleurally, intratracheally, intranasally, intravitreally, intravaginally, intrarectally, topically, intratumorally, peritoneally, subcutaneously, subconjunctivally, intravesicularlly, mucosally, intrapericardially, intraumbilically, intraocularly, orally, topically, locally, by inhalation, by injection, by infusion, by continuous infusion, by localized perfusion bathing target cells directly, by catheter, by lavage, by gavage, in cremes, or in lipid compositions.

28. The method of any one of claims 22 to 27, wherein said subject is administered at least one dose of said vaccine.

29. The method of claim 28, wherein said subject is administered at least two doses of said vaccine.

30. The method of claim 28 or 29, wherein said vaccine is administered to said subject as a prime, a boost, or as a prime-boost.

31. The method of claim 30, wherein said vaccine is administered to said subject as said boost.

32. The method of claim 31, comprising, prior to administering a therapeutically effective amount of the stabilized trimer of any one of claims 1-5, the composition of any one of claims 6-11, the vaccine of any one of claims 12-16, the nucleic acid molecule of claim 17, and/or the vector of any one of claims 18-21 to said subject, administering a prime vaccine comprising at least a first vector comprising a first nucleic acid molecule that encodes a polypeptide having at least 85% amino acid sequence identity to SEQ ID NO: 6 and optionally a second vector comprising a second nucleic acid molecule that encodes a polypeptide having at least 85% identity to SEQ ID NO: 7.

33. A method of manufacturing a vaccine for treating or reducing the risk of an HIV infection in a subject in need thereof, said method comprising the steps of:
(a) contacting vector of claim 18 with a cell; and
(b) expressing said at least one gp140 polypeptide to form a stabilized trimer in said cell.

34. The method of claim 33, wherein said method is performed *in vitro* or *ex vivo*.

35. The method of claim 33 or 34, wherein said cell is a bacterial, plant, or mammalian cell.

36. The method of claim 35, wherein said mammalian cell is a 293T cell.

37. A kit comprising:

(a) the stabilized trimer of any one of claims 1-5, the composition of any one of claims 6-11, the vaccine of any one of claims 12-16, the nucleic acid molecule of claim 17, and/or the vector of any one of claims 18-21;

(b) a pharmaceutically acceptable carrier, excipient, or diluent; and

(c) instructions for use thereof,

wherein said kit optionally includes an adjuvant.

Claims

1. A stabilized trimer comprising three gp140 polypeptides, wherein each of said gp140 polypeptides comprises an amino acid sequence having at least 95% identity to, or the sequence of, SEQ ID NO: 2.

2. The stabilized trimer of claim 1, wherein each of the gp140 polypeptides comprises amino acids 30-724 of SEQ ID NO: 2.

3. A composition comprising the stabilized trimer of claim 1 or 2.

4. The composition of claim 3, further comprising one or more different stabilized trimers.

5. The composition of claim 4, wherein the one or more different stabilized trimers comprise three gp140 polypeptides and wherein each of these gp140 polypeptides comprises an amino acid sequence comprising at least 95% identity to, or the sequence of, SEQ ID NO: 3.

6. The composition of any one of claims 3-5, further comprising a pharmaceutically acceptable carrier, excipient, or diluent.

7. The composition of any one of claims 3-6, further comprising an adjuvant.

8. A vaccine comprising the composition of any one of claims 3-7.

9. A nucleic acid molecule comprising a nucleotide sequence encoding at least one gp140 polypeptide, wherein said gp140 polypeptide comprises an amino acid sequence having at least 95% identity to SEQ ID NO: 2.

10. The nucleic acid molecule of claim 9, wherein said gp140 polypeptide comprises amino acids 30-724 of SEQ ID NO: 2.

11. A vector comprising the nucleic acid molecule of claim 9 or 10.

12. Use of a therapeutically effective amount of the stabilized trimer of claim 1 or 2, the composition of any one of claims 3-7, the vaccine of claim 8, the nucleic acid molecule of claim 9 or 10, and/or the vector of claim 11 in the manufacture of a medicament for treating or reducing the risk of an HIV infection in a subject in need thereof.

13. Use of a therapeutically effective amount of the stabilized trimer of claim 1 or 2, the composition of any one of claims 3-7, the vaccine of claim 8, the nucleic acid molecule of claim 9 or 10, and/or the vector of claim 11 in the manufacture of a medicament for reducing an HIV-mediated activity in a subject infected with HIV.

14. The use of claim 12 or 13, wherein the medicament is formulated for administration as a boost after administration of a prime vaccine comprising at least a first vector comprising a first nucleic acid molecule that encodes a polypeptide having at least 85% amino acid sequence identity to

SEQ ID NO: 6 and optionally a second vector comprising a second nucleic acid molecule that encodes a polypeptide having at least 85% amino acid sequence identity to SEQ ID NO: 7.

15. A method of manufacturing a vaccine for treating or reducing the risk of an HIV infection in a subject in need thereof, said method comprising the steps of:
(a) contacting the vector of claim 11 with a cell; and
(b) expressing said at least one gp140 polypeptide to form a stabilized trimer in said cell.