CLAIMS

1. An isolated influenza virus that is capable of infecting a canid animal, wherein the ~~canid animal~~ virus belongs to the group comprising type A strains ~~A/canine/Florida/43/04, A/canine/Florida/242/2003,~~ canine/Miami/05 and canine/Jax/05. ~~A recombinant viral vector comprising a polynucleotide which encodes a polypeptide having the amino acid sequence shown in any of SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78, or a functional and/or immunogenic fragment thereof, or said polynucleotide encodes a polypeptide having 98% or greater sequence identity with the amino acid sequence shown in any of SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78.~~

2. The influenza virus according to claim 1, wherein said influenza virus has an HA serotype of H3.~~The recombinant viral vector according to claim 1, wherein said polynucleotide comprises the nucleotide sequence shown in any of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, or 77, or said polynucleotide has 98% or greater sequence identity with the nucleotide sequence shown in any of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, or 77.~~

3. The influenza virus according to claim 1, wherein said influenza virus has the serotype H3N8.~~A recombinant viral vector comprising a polynucleotide encoding a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:16, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:62, or SEQ ID NO:78, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:16, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:62, or SEQ ID NO:78, wherein said HA protein comprises a serine at position 82, a leucine at position 221, a threonine at position 327, and a threonine at position 482 of the amino acid sequence.~~

4. The influenza virus according to claim 1, wherein said influenza virus comprises a polynucleotide which encodes a polypeptide having the amino acid sequence shown in any of SEQ ID NOs: ~~2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34,~~ 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78, or a functional and/or immunogenic fragment thereof, or said polynucleotide encodes a polypeptide having 99% or greater sequence identity with the amino acid sequence shown in any of SEQ ID NOs: ~~2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34,~~ 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78.~~The recombinant viral vector according to claim 3, wherein said polynucleotide encodes a hemagglutinin (HA) that comprises the amino acid sequence of SEQ ID NO:16, SEQ ID NO:32, SEQ ID NO:62, or SEQ ID NO:78, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:16, SEQ ID NO:32, SEQ ID NO:62, or SEQ ID NO:78.~~

5. The influenza virus according to claim 1, wherein said influenza virus comprises a polynucleotide having the nucleotide sequence shown in any of SEQ ID NOs: ~~1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31,~~ 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, or 77, or said polynucleotide has 98% or greater sequence identity with the nucleotide sequence shown in any of SEQ ID NOs: ~~1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31,~~ 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, or 77.~~The recombinant viral vector according to claim 3, wherein said polynucleotide comprises the nucleotide sequence of SEQ ID NO:15, SEQ ID NO:31, SEQ ID NO:61, or SEQ ID NO:77, or a nucleotide sequence having 98% or greater sequence identity to SEQ ID NO:15, SEQ ID NO:31, SEQ ID NO:61, or SEQ ID NO:77.~~

6. An isolated polynucleotide that comprises all or part of a genomic segment or gene of an influenza virus of any of claims 1 to 5, wherein said influenza virus comprises a polynucleotide which encodes a polypeptide having the amino acid sequence shown in any of SEQ ID NOs: ~~2, 4, 6, 8, 10, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34,~~ 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78, or a functional and/or immunogenic fragment thereof, or said polynucleotide encodes a polypeptide having 99% or greater sequence identity with the amino acid sequence shown in any of SEQ ID NOs: ~~2, 4, 6, 8, 10, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34,~~ 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78.~~The recombinant~~

~~viral vector according to any preceding claim, wherein said viral vector is from adenovirus, avipox, herpesvirus, vaccinia virus, canarypox, entomopox, swinepox, or West Nile virus.~~

7. The polynucleotide according to claim 6, wherein said polynucleotide comprises all or part of an influenza gene selected from the group consisting of a neuraminidase gene, a nucleoprotein gene, a matrix protein gene, a polymerase basic protein gene, a polymerase acidic protein gene, a non-structural protein gene, and a hemagglutinin gene.

~~The recombinant viral vector according to any preceding claim, wherein said viral vector is a canarypox viral vector.~~

8. The polynucleotide according to claim 6, wherein said influenza virus comprises a polynucleotide which encodes a polypeptide having the amino acid sequence shown in any of SEQ ID NOs: ~~2, 4, 6, 8, 10, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34,~~ 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78, or a functional and/or immunogenic fragment thereof, or said polynucleotide encodes a polypeptide having 99% or greater sequence identity with the amino acid sequence shown in any of SEQ ID NOs: ~~2, 4, 6, 8, 10, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34,~~ 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78.

~~A polynucleotide vector comprising a polynucleotide which encodes a polypeptide having the amino acid sequence shown in any of SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78, or a functional and/or immunogenic fragment thereof, or said polynucleotide encodes a polypeptide having 98% or greater sequence identity with the amino acid sequence shown in any of SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78.~~

9. The polynucleotide according to claim 6, wherein said influenza virus comprises a polynucleotide having the nucleotide sequence shown in any of SEQ ID NOs: ~~1, 3, 5, 7, 9,11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31,~~ 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, or 77, or said polynucleotide has 98% or greater sequence identity with the nucleotide sequence shown in any of SEQ ID NOs: ~~1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31,~~ 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, or 77.

~~The polynucleotide vector according to claim 8, wherein said polynucleotide comprises the nucleotide sequence shown in any of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, or 77, or said polynucleotide has 98% or greater sequence identity with the nucleotide sequence shown in any of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, or 77.~~

10. A polynucleotide expression construct comprising a polynucleotide of any of claims 6 to 9.

~~A polynucleotide vector comprising a polynucleotide encoding a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:16, SEQ ID NO:32, SEQ ID NO:33, 85 SEQ ID NO:34, SEQ ID NO:62, or SEQ ID NO:78, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:16, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:62, or SEQ ID NO:78, wherein said HA protein comprises a serine at position 82, a leucine at position 221, a threonine at position 327, and a threonine at position 482 of the amino acid sequence.~~

11. The oligonucleotide that can hybridize to a coding or non-coding sequence of a polynucleotide of any of claims 6 to 9~~, wherein said oligonucleotide comprises a nucleotide sequence shown in any of SEQ ID NOs: 35, 36, 37, 38, 39, 40, 41, 42,43, 44, 45, 46, 79, 80, 81, 82, 83, 84, 85, 86, 87, or 88.~~ ~~The polynucleotide vector according to claim 10, wherein said polynucleotide encodes a hemagglutinin (HA) that comprises the amino acid sequence of SEQ ID NO:16, SEQ ID NO:32, SEQ ID NO:62, or SEQ ID NO:78, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:16, SEQ ID NO:32, SEQ ID NO:62, or SEQ ID NO:78.~~

12. An isolated polypeptide encoded by a polynucleotide of any of claims 6 to 9. ~~The polynucleotide vector according to claim 10, wherein said polynucleotide comprises the nucleotide sequence of SEQ ID NO:15, SEQ ID NO:31, SEQ ID NO:61, or SEQ ID NO:77, or a nucleotide sequence having 98% or greater sequence identity to SEQ ID NO:15, SEQ ID NO:31, SEQ ID NO:61, or SEQ ID NO:77.~~

13. The polypeptide according to claim 12, wherein said polypeptide is selected from the group consisting of a hemagglutinin protein, a neuraminidase protein, a nucleoprotein, a matrix protein, a polymerase basic protein, a polymerase acidic protein, and a non-structural protein.

~~The polynucleotide vector according to claim 10, wherein said polynucleotide vector is a viral vector.~~

14. A composition comprising an immunogen of an influenza virus of any of claims 1 to 5:

wherein said immunogen is capable of inducing an immune response against an influenza virus that is capable of infecting a canid animal;

wherein said immunogen comprises cell-free whole virus, or a portion thereof; a viral polynucleotide; a viral protein; a viral polypeptide or peptide; a virus infected cell; a recombinant viral vector based construct; a reassortant virus; or naked nucleic acid of said virus; and

wherein said viral protein, polypeptide, or peptide comprises an amino acid sequence shown in any of SEQ ID NOs: ~~2, 4, 6, 8, 10, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34,~~ 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78, or a functional and/or immunogenic fragment thereof, or said polynucleotide encodes a polypeptide having 99% or greater sequence identity with the amino acid sequence shown in any of SEQ ID NOs: ~~2, 4, 6, 8, 10, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34,~~ 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78.

~~A reassortant virus comprising at least one gene or genomic segment or polynucleotide of a canine influenza virus.~~

15. The composition according to claim 14, wherein said viral polynucleotide encodes a polypeptide comprising an amino acid sequence shown in any of SEQ ID NOs: ~~2, 4, 6, 8, 10, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34,~~ 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78, or a functional and/or immunogenic fragment thereof.

~~The reassortant virus according to claim 14, wherein said reassortant virus is formulated in a pharmaceutically acceptable carrier or diluent.~~

16. Use of a composition according to any of claims 14 or 15 for the manufacture of a medicament for inducing an immune response in an animal against an influenza virus of any of claims 1 to 5.

~~The reassortant virus according to claim 14, wherein said reassortant virus comprises one or more polynucleotides wherein said one or more polynucleotides encode one or more canine influenza virus proteins selected from the group HA, NA, NP, MA, PB1, PB2, PA, and/or NS, or a functional or immunogenic fragment thereof.~~

17. The use according to claim 16, wherein said composition comprises a viral protein, polypeptide, or peptide comprising an amino acid sequence shown in any of SEQ ID NOs: ~~2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34,~~ 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78, or a functional and/or immunogenic fragment thereof.

~~The reassortant virus according to claim 16, wherein said one or more polynucleotides encode a polypeptide having the amino acid sequence shown in any of SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78, or a functional and/or immunogenic fragment thereof, or said polynucleotide encodes a polypeptide having 98% or greater sequence identity with the amino acid sequence shown in any of SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 33, 34, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78.~~

18. The use according to claim 16, wherein said immune response is a protective immune response that prevents or inhibits infection of said animal by an influenza virus.

~~The reassortant virus according to claim 16, wherein said one or more polynucleotides comprise the nucleotide sequence shown in any of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, or 77, or said polynucleotide has 98% or greater sequence identity with the nucleotide sequence shown in any of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, or 77.~~

19. The use according to claim 16, wherein said influenza virus has an HA serotype selected from H3.

~~The reassortant virus according to claim 16, wherein said HA protein comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 16, 32, 33, 34, 62, and 78, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:16, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:62, or SEQ ID NO:78, wherein said HA protein comprises a serine at position 82, a leucine at position 221, a threonine at position 327, and a threonine at position 482 of the amino acid sequence.~~

20. The use according to claim 16, wherein said influenza virus has the serotype H3N8.

~~The reassortant virus according to claim 16, wherein said NA protein comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 12, 28, 58, and 74.~~

21. The use according to claim 16, wherein said composition further comprises an adjuvant.

~~The reassortant virus according to claim 16, wherein said NP protein comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 10, 26, 56, and 72.~~

22. The use according to claim 16, wherein said animal is a canid.~~The reassortant virus according to claim 16, wherein said MA protein comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 14, 30, 60, and 76.~~

23. The use according to claim 22, wherein said canid animal is a domesticated dog.~~The reassortant virus according to claim 16, wherein said PB1 protein comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 4, 20, 50, and 66.~~

24. The use according to claim 16, wherein said composition is administered parenterally.~~The reassortant virus according to claim 16, wherein said PB2 protein comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 2, 18, 48, and 64.~~

25. The use according to claim 24, wherein said composition is administered subcutaneously, intraperitoneally, or intramuscularly.~~The reassortant virus according to claim 16,~~

~~wherein said PA protein comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 6, 22, 52, and 68.~~

26. The use according to claim 16, wherein said composition is administered nasally or orally.

~~The reassortant virus according to claim 16, wherein said NS protein comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 8, 24, 54, and 70.~~

27. A cell comprising an influenza virus of any of claims 1 to 5 or a polynucleotide of claim 6.

~~The reassortant virus according to claim 16, wherein the reassortant virus is inactivated.~~

28. The cell according to claim 27, wherein said cell is a canid animal cell.

~~The reassortant virus according to claim 16, wherein the reassortant virus is attenuated.~~

29. A method for detection of an influenza virus of that is capable of infecting a canid animal, said method comprising obtaining a biological sample from an animal and screening said sample for the presence of an antibody that binds to a protein, polypeptide, or peptide of an influenza virus of any of claims 1 to 5.

~~A vaccine comprising a recombinant viral vector of any of claims 1 to 7, or a polynucleotide vector of any of claims 8 to 13, or a reassortant virus of any of claims 14 to 28.~~

30. A method for detection of an influenza virus that is capable of infecting a canid animal, said method comprising obtaining a nucleic acid sample from an animal, and contacting said nucleic acid sample with an oligonucleotide according to claim 11, and determining if said oligonucleotide hybridizes under stringent conditions to said nucleic acid.

~~The vaccine according to claim 29, wherein the vaccine comprises a pharmaceutically acceptable carrier or diluent.~~

31. A method for screening for a compound that possesses antiviral activity against an influenza virus that is capable of infecting a canid animal, said method comprising contacting a

cell infected with or comprising a virus of any of claims 1 to 5 with a test compound and determining whether said test compound inhibits activity of said virus in said cell.~~The vaccine according to claim 29, wherein the vaccine comprises an adjuvant.~~

32. A reassortant virus comprising at least one gene, genomic segment, or a polynucleotide of an influenza virus of claim 1.

33. An isolated virus that comprises one or more polynucleotides wherein said one or more polynucleotides encode a ~~canid animal~~ protein selected from the group consisting of HA, NA, NP, MA, PBl, PB2, PA, and NS_5 or a functional or immunogenic fragment thereof, wherein the ~~canid animal~~ virus belongs to the group comprising type A strains ~~A/canine/Florida/43/04, A/canine/Florida/242/2003,~~ canine/Miami/05 and canine/Jax/05.

34. The virus according to claim 33, wherein said one or more polynucleotides comprise a nucleotide sequence selected from the group consisting of SEQ ID NOs: ~~1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31,~~ 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, and 77.

35. The virus according to claim 33, wherein said HA protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: ~~16, 32, 62,~~62 and 78.

36. The virus according to claim 33, wherein said NA protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: ~~12, 28,~~ 58~~,~~ and 74.

37. The virus according to claim 33, wherein said NP protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: ~~10, 26,~~ 56~~,~~ and 72.

38. The virus according to claim 33, wherein said MA protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: ~~14, 30, 60,~~ 60 and 76.

39. The virus according to claim 33, wherein said PBl protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: ~~4, 20, 50,~~50 and 66.

40. The virus according to claim 33, wherein said PB2 protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: ~~2, 18, 48,~~48 and 64.

41. The virus according to claim 33, wherein said PA protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: ~~6, 22, 52,~~52 and 68.

42. The virus according to claim 33, wherein said NS protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: ~~8, 24, 54,~~54 and 70.

43. A method for detection of an influenza virus that is capable of infecting a canid animal, said method comprising obtaining a sample containing nucleic acid from an animal, and contacting said nucleic acid sample with a forward and reverse oligonucleotide primer that binds specifically to a polynucleotide or gene sequence of said virus under conditions sufficient for generation of an amplification product if the nucleic acid contains a sequence to which said primers bind; and detecting said amplification product, wherein the virus~~canid animal~~ belongs to the group comprising type A strains~~ A/canine/Florida/43/04, A/canine/Florida/242/2003,~~ canine/Miami/05 and canine/Jax/05.

44. The method according to claim 43, wherein said oligonucleotide primer is an oligonucleotide according to claim 11.

45. An isolated canine influenza virus type A, wherein said influenza virus has an HA serotype of H3 and wherein said influenza virus comprises a polynucleotide which encodes a polypeptide comprising the amino acid sequence shown in SEQ ID NO: 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78, or said polynucleotide encodes a polypeptide comprising 98% or greater sequence identity with the amino acid sequence shown in SEQ ID NO: 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78; or wherein said influenza virus comprises a polypeptide comprising the amino acid sequence shown in SEQ ID NO: 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78, or said polypeptide comprises 98% or greater sequence

identity with the amino acid sequence shown in SEQ ID NO: 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, or 78.