CLAIMS

We claim:

1. An isolated influenza virus that is capable of infecting a canid animal.

2. The influenza virus according to claim 1, wherein said influenza virus has an HA serotype of H3.

3. The influenza virus according to claim 1, wherein said influenza virus has the serotype H3N8.

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.

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.

6. The influenza virus according to claim 1, wherein said influenza virus is the viral isolate designated as A/canine/Florida/43/2004 or the viral isolate designated as A/canine/Florida/242/2003.

7. The influenza virus according to claim 1, wherein said influenza virus is the viral isolate designated as canine/Jax/05 or the viral isolate designated as canine/Miami/05.

8. The influenza virus according to claim 1, wherein said influenza virus is inactivated or attenuated.

9. The influenza virus according to claim 1, wherein said influenza virus is provided in a pharmaceutically acceptable carrier or diluent.

10. An isolated polynucleotide that comprises all or part of a genomic segment or gene of an influenza virus of claim 1.

11. The polynucleotide according to claim 10, 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.

12. The polynucleotide according to claim 10, 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.

13. The polynucleotide according to claim 10, 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.

14. The polynucleotide according to claim 10, wherein said polynucleotide is formulated ina pharmaceutically acceptable carrier or diluent.

15. A polynucleotide expression construct comprising a polynucleotide of claim 10.

16. An oligonucleotide that can hybridize to a coding or a non-coding sequence of a polynucleotide of claim 10.

17. The oligonucleotide according to claim 16, wherein said oligonucleotide hybridizes to said sequence under high stringency conditions.

18. The oligonucleotide according to claim 16, wherein said oligonucleotide is 10 to 500 nucleotides, 10 to 20 nucleotides, 21 to 30 nucleotides, 31 to 40 nucleotides, 41 to 50 nucleotides, 51 to 60 nucleotides, 61 to 70 nucleotides, 71 to 80 nucleotides, 81 to 90 nucleotides, or 91 to 100 nucleotides in length.

19. The oligonucleotide according to claim 16, wherein said oligonucleotide comprises a detectable label or a reporter molecule.

20. The oligonucleotide according to claim 16, wherein said oligonucleotide has from about 90 percent to 100 percent nucleotide sequence identity with a polynucleotide that comprises all or part of a genomic segment or gene of an influenza virus of claim 1.

21. The oligonucleotide according to claim 16, 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.

22. An isolated polypeptide encoded by a polynucleotide of claim 10.

23. The polypeptide according to claim 22, 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.

24. The polypeptide according to claim 22, wherein said polypeptide comprises 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.

25. The polypeptide according to claim 22, wherein said polypeptide is formulated in a pharmaceutically acceptable carrier or diluent.

26. A composition comprising an immunogen of an influenza virus of claim 1, wherein said immunogen is capable of inducing an immune response against an influenza virus that is capable of infecting a canid animal.

27. The composition according to claim 26, 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.

28. The composition according to claim 27, wherein said viral protein, polypeptide, or peptide comprises 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, 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.

29. The composition according to claim 27, wherein said viral polynucleotide encodes a polypeptide 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.

30. The composition according to claim 26, wherein said composition is formulated in a pharmaceutically acceptable carrier or diluent.

31. A method for inducing an immune response in an animal against an influenza virus capable of infecting a canid animal, said method comprising administering to said animal an effective amount of a composition according to claim 26.

32. The method according to claim 31, 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.

33. The method according to claim 31, wherein said composition comprises an influenza virus or a portion of said virus that is capable of infecting a canid animal.

34. The method according to claim 33, wherein said influenza virus is selected from the group consisting of viral isolate designated as A/canine/Florida/43/2004, viral isolate designated as A/canine/Florida/242/2003, viral isolate designated as canine/Jax/05 or viral isolate designated as canine/Miami/05, or a portion of any of said viral isolates.

35. The method according to claim 31, wherein said immune response is a protective immune response that prevents or inhibits infection of said animal by an influenza virus.

36. The method according to claim 31, wherein said influenza virus has an HA serotype selected from H3.

37. The method according to claim 31, wherein said influenza virus has the serotype H3N8.

38. The method according to claim 31, wherein said composition further comprises an adjuvant.

39. The method according to claim 31, wherein said animal is a canid.

40. The method according to claim 39, wherein said canid animal is a domesticated dog.

41. The method according to claim 31, wherein said composition is administered parenterally.

42. The method according to claim 41, wherein said composition is administered subcutaneously, intraperitoneally, or intramuscularly.

43. The method according to claim 31, wherein said composition is administered nasally or orally.

44. The method according to claim 33, wherein said influenza virus is inactivated or attenuated.

45. An isolated antibody that binds specifically to an epitope of a polypeptide of any of claim 22.

46. The antibody according to claim 45, wherein said antibody is a monoclonal antibody.

47. The antibody according to claim 45, wherein said antibody binds to a hemagglutinin protein.

48. The antibody according to claim 47, wherein said hemagglutinin protein is an H3 hemagglutinin protein.

49. The antibody according to claim 47, wherein said hemagglutinin protein comprises an amino acid sequence shown in SEQ ID NO: 16, SEQ ID NO: 32, SEQ ID NO: 62, or SEQ ID NO: 78.

50. A cell comprising:

a) an influenza virus that is capable of infecting a canid animal; or

b) a polynucleotide that comprises all or part of a genomic segment or gene of an influenza virus of claim 1.

51. The cell according to claim 50, wherein said cell is a canid animal cell.

52. 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 or a ligand that binds to a protein, polypeptide, or peptide of an influenza virus of claim 1.

53. 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 16, and determining if said oligonucleotide hybridizes under stringent conditions to said nucleic acid.

54. 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 claim 1 with a test compound and determining whether said test compound inhibits activity of said virus in said cell.

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

56. The reassortant virus according to claim 55, wherein said reassortant virus is formulated in a pharmaceutically acceptable carrier or diluent.

57. An isolated virus that comprises one or more polynucleotides wherein said one or more polynucleotides encode a canine influenza virus protein selected from the group consisting of HA, NA, NP, MA, PB1, PB2, PA, and NS, or a functional or immunogenic fragment thereof.

58. The virus according to claim 57, 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.

59. The virus according to claim 57, wherein said HA protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: 16, 32, 62, and 78.

60. The virus according to claim 57, wherein said NA protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: 12, 28, 58, and 74.

61. The virus according to claim 57, wherein said NP protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: 10, 26, 56, and 72.

62. The virus according to claim 57, wherein said MA protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: 14, 30, 60, and 76.

63. The virus according to claim 57, wherein said PB1 protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: 4, 20, 50, and 66.

64. The virus according to claim 57, wherein said PB2 protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: 2, 18, 48, and 64.

65. The virus according to claim 57, wherein said PA protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: 6, 22, 52, and 68.

66. The virus according to claim 57, wherein said NS protein has an amino acid sequence selected from the group consisting of SEQ ID NOs: 8, 24, 54, and 70.

67. The virus according to claim 57, wherein said virus is provided in a pharmaceutically acceptable carrier or diluent.

68. 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.

69. The method according to claim 68, wherein said oligonucleotide primer is an oligonucleotide that hybridize to a coding or non-coding sequence of a polynucleotide that comprises all or a part of a genomic segment or gene of an influenza virus that is capable of infecting a canid animal.

70. A method for protecting a canine from an influenza virus infection, wherein the method comprises administering to the canine a therapeutically effective amount of a vaccine comprising:

at least one equine influenza virus antigen, and

at least one pharmaceutically acceptable excipient.

71. The method according to claim 70, wherein the equine influenza virus antigen(s) comprises an inactivated virus(s).

72. The method according to claim 70, wherein the equine influenza virus antigen(s) comprises a live attenuated virus(s).

73. The method according to claim 70, wherein the vaccine comprises equine influenza virus antigens from more than one virus isolate.

74. The method according to claim 70, wherein the vaccine comprises at least one antigen from an H7 influenza virus.

75. The method according to claim 70, wherein the vaccine is administered subcutaneously.

76. The method according to claim 70, wherein the vaccine is administered intranasally.

77. The method according to claim 70, wherein the vaccine is administered in combination with at least one vaccine selected from the group consisting of a bordetella vaccine, adenovirus vaccine, and parainfluenza virus vaccine.

78. A method for protecting a canine from an H3 influenza virus infection, wherein the method comprises administering to the canine a therapeutically effective amount of a vaccine comprising:

at least one H3 influenza virus antigen and/or at least one H7 influenza virus antigen, and

at least one pharmaceutically acceptable excipient.

79. The method according to claim 78, wherein said vaccine comprises one or more antigens from one or more of the following canine influenza viral isolates: A/canine/Florida/43/2004, A/canine/Florida/242/2003, canine/Jax/05, and canine/Miami/05.

80. The method according to claim 78, wherein the vaccine comprises at least one antigen from an H7 influenza virus.

81. The method according to claim 78, wherein the H3 influenza virus antigen(s) comprises an inactivated virus(s).

82. The method according to claim 81, wherein said vaccine comprises one or more antigens from one or more of the following canine influenza viral isolates: A/canine/Florida/43/2004, A/canine/Florida/242/2003, canine/Jax/05, and canine/Miami/05.

83. The method according to claim 78, wherein the H3 influenza virus antigen(s) comprises a live attenuated virus(s).

84. The method according to claim 78, wherein the vaccine comprises at least one antigen of a virus isolate isolated from an infected canine.

85. The method according to claim 78, wherein the vaccine comprises antigens from more than one virus isolate.

86. The method according to claim 78, wherein the vaccine is administered subcutaneously.

87. The method according to claim 78, wherein the vaccine is administered intranasally.

88. The method according to claim 78, wherein the vaccine is administered to the canine once.

89. The method according to claim 78, wherein the vaccine is administered to the canine at least two times.

90. The method according to claim 89, wherein a second dose of the vaccine is administered to the canine at from about 2 to about 8 weeks after the first dose.

91. The method according to claim 78, wherein the vaccine is administered in combination with at least one vaccine selected from the group consisting of a bordetella vaccine, adenovirus vaccine, and parainfluenza virus vaccine.

92. A method for protecting a canine from respiratory lesions caused by canine influenza virus, wherein the method comprises administering to the canine a therapeutically effective amount of a vaccine comprising:

at least one equine influenza virus antigen, and

at least one pharmaceutically acceptable excipient.

93. The method according to claim 92, wherein the vaccine is administered to the canine before the canine is infected with canine influenza virus.

94. A method for protecting a canine from respiratory lesions caused by canine influenza virus, wherein the method comprises administering to the canine a therapeutically effective amount of a vaccine comprising:

at least one H3 influenza virus antigen and/or at least one H7 influenza virus antigen, and

at least one pharmaceutically acceptable excipient.

95. The method according to claim 94, wherein the vaccine is administered to the canine before the canine is infected with canine influenza virus.

96. A method for protecting a canine from having canine influenza virus in nasal or oral secretion caused by canine influenza virus infection, wherein the method comprises administering to the canine a therapeutically effective amount of a vaccine comprising:

at least one equine influenza virus antigen, and

at least one pharmaceutically acceptable excipient.

97. The method according to claim 96, wherein the vaccine is administered to the canine before the canine is infected with canine influenza virus.

98. A method for protecting a canine from having canine influenza virus in nasal or oral secretion caused by canine influenza virus infection, wherein the method comprises administering to the canine a therapeutically effective amount of a vaccine comprising:

at least one H3 influenza virus antigen and/or at least one H7 influenza virus antigen, and

at least one pharmaceutically acceptable excipient.

99. The method according to claim 98, wherein the vaccine is administered to the canine before the canine is infected with canine influenza virus.

100. A canine influenza vaccine, wherein the vaccine comprises:

a therapeutically effective amount of at least one H3 influenza virus antigen and/or at least one H7 influenza virus antigen, and

at least one pharmaceutically acceptable excipient.

101. The vaccine according to claim 100, wherein said vaccine comprises one or more antigens from one or more of the following canine influenza viral isolates: A/canine/Florida/43/2004, A/canine/Florida/242/2003, canine/Jax/05, and canine/Miami/05.

102. The vaccine according to claim 100, wherein the virus antigen(s) comprises an inactivated virus(s).

103. The vaccine according to claim 102, wherein said vaccine comprises one or more antigens from one or more of the following canine influenza viral isolates: A/canine/Florida/43/2004, A/canine/Florida/242/2003, canine/Jax/05, and canine/Miami/05

104. The vaccine according to claim 100, wherein the virus antigen(s) comprises a live attenuated virus(s).

105. A canine influenza vaccine, wherein the vaccine comprises:
a therapeutically effective amount of an equine influenza virus antigen, and
at least one pharmaceutically acceptable excipient.

106. The vaccine according to claim 105, wherein the equine influenza virus antigen(s) comprises an inactivated virus(s).

107. The vaccine according to claim 105, wherein the virus antigen(s) comprises a live attenuated virus(s).

108. A kit for protecting a canine from influenza virus infection, wherein the kit comprises:

a therapeutically effective amount of a vaccine that comprises at least one equine influenza virus antigen, and

at least one component selected from the group consisting of:

an apparatus for administering the vaccine to the canine,

a pharmaceutically acceptable excipient that aids in administering the vaccine to the canine,

a pharmaceutically acceptable excipient that enhances the canine's immune response to the vaccine,

a food to be consumed by the canine simultaneously with the vaccine, and

a treat to be consumed by the canine simultaneously with the vaccine.

109. The kit according to claim 108, wherein the kit comprises an apparatus for subcutaneously administering the vaccine to the canine.

110. The kit according to claim 108, wherein the kit comprises an apparatus for intranasally administering the vaccine to the canine.

111. A kit for protecting a canine from an H3 influenza virus infection, wherein the kit comprises:

a therapeutically effective amount of a vaccine that comprises at least one H3 influenza virus antigen and/or at least one H7 influenza virus antigen, and

at least one component selected from the group consisting of:

an apparatus for administering the vaccine to the canine,

a pharmaceutically acceptable excipient that aids in administering the vaccine to the canine,

a pharmaceutically acceptable excipient that enhances the canine's immune response to the vaccine,

a food to be consumed by the canine simultaneously with the vaccine, and

a treat to be consumed by the canine simultaneously with the vaccine.

112. The kit according to claim 111, wherein:

the kit comprises two doses of the vaccine, and

the two doses together comprise a therapeutically effective amount of the vaccine.

113. The kit according to claim 111, wherein the kit comprises an apparatus for subcutaneously administering the vaccine to the canine.

114. The kit according to claim 111, wherein the kit comprises an apparatus for intranasally administering the vaccine to the canine.

1. An isolated canine influenza virus wherein said influenza virus comprises a polynucleotide which encodes a polypeptide comprising the amino acid sequence of SEQ ID NO:33, or a polynucleotide encodes a polypeptide having 99% or greater sequence identity with the amino acid sequence of SEQ ID NO:33.

2. The canine influenza virus according to claim 1, wherein said influenza virus is inactivated or attenuated.

3. The canine influenza virus according to claim 1, wherein said influenza virus is provided in a pharmaceutically acceptable carrier or diluent.

4. An isolated cell comprising a canine influenza virus of claim 1.

5. The cell according to claim 4, wherein said cell is a canid animal cell.

6. A vaccine comprising a canine influenza virus of claim 2.

7. The canine influenza vaccine according to claim 6, wherein said influenza virus is inactivated.

8. The canine influenza vaccine according to claim 6, wherein said influenza virus is attenuated.

9. A composition comprising a canine influenza virus wherein said influenza virus comprises a polynucleotide which encodes a polypeptide comprising the amino acid sequence of SEQ ID NO:33, or a polynucleotide encodes a polypeptide having 99% or greater sequence identity with the amino acid sequence of SEQ ID NO:33.

10. The composition according to claim 9, wherein said composition further 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.

11. The canine influenza virus according to claim 9, wherein said influenza virus is inactivated or attenuated.

12. The composition according to claim 11, wherein said composition is formulated in a pharmaceutically acceptable carrier or diluent.

13. A reassortant virus comprising a polynucleotide which encodes a polypeptide comprising the amino acid sequence of SEQ ID NO:33, or said polynucleotide encodes a polypeptide having 99% or greater sequence identity with the amino acid sequence of SEQ ID NO:33.

14. The reassortant virus according to claim 13, wherein said reassortant virus is formulated in a pharmaceutically acceptable carrier or diluent.

15. An isolated virus that comprises one or more polynucleotides wherein said one or more polynucleotides encode a canine influenza virus polypeptide comprising the amino acid sequence of SEQ ID NO:33, or said polynucleotide encodes a polypeptide having 99% or greater sequence identity with the amino acid sequence of SEQ ID NO:33.

16. The virus according to claim 15, wherein said virus is provided in a pharmaceutically acceptable carrier or diluent.

17. An isolated canine influenza virus, wherein said influenza virus comprises a polynucleotide encoding a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:33, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ

ID NO:33, 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.

18. An isolated canine influenza virus, wherein said influenza virus comprises a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:33, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:33, 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.

19. A composition comprising a canine influenza virus, wherein said canine influenza virus comprises a polynucleotide encoding a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:33, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:33, 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, wherein said canine influenza virus is capable of inducing an immune response against an influenza virus that is capable of infecting a canid animal.

20. A composition comprising a canine influenza virus, wherein said canine influenza virus comprises a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:33, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:33, 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, wherein said canine influenza virus is capable of inducing an immune response against an influenza virus that is capable of infecting a canid animal.

21. A reassortant virus comprising a polynucleotide encoding a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:33, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:33, 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.

22. A reassortant virus comprising a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:33, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:33, 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.

23. An isolated virus comprising a polynucleotide encoding a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:33, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:33, 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.

24. An isolated virus comprising a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:33, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:33, 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.

25. The canine influenza virus according to claim 17, wherein said polynucleotide encodes a hemagglutinin (HA) that comprises the amino acid sequence of SEQ ID NO:16, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:16.

26. The canine influenza virus according to claim 18, wherein said hemagglutinin (HA) comprises the amino acid sequence of SEQ ID NO:16, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:16.

27. The reassortant virus according to claim 21, wherein said reassortant virus comprises a polynucleotide encoding a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID

NO:16, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:16.

28. The reassortant virus according to claim 22, wherein said reassortant virus comprises a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:16, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:16.

29. The virus according to claim 23, wherein said virus comprises a polynucleotide encoding a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:16, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:16.

30. The virus according to claim 24, wherein said virus comprises a hemagglutinin (HA) comprising the amino acid sequence of SEQ ID NO:16, or an amino acid sequence having greater than 95% amino acid sequence identity to SEQ ID NO:16.

31. The canine influenza virus according to claim 17, wherein said influenza virus is inactivated.

32. The canine influenza virus according to claim 17, wherein said influenza virus is provided in a pharmaceutically acceptable carrier or diluent.

33. The canine influenza virus according to claim 18, wherein said influenza virus is inactivated.

34 The canine influenza virus according to claim 18, wherein said influenza virus is provided in a pharmaceutically acceptable carrier or diluent.

35. The reassortant virus according to claim 21, wherein said virus is inactivated.

36. The reassortant virus according to claim 21, wherein said virus is provided in a pharmaceutically acceptable carrier or diluent.

37. The reassortant virus according to claim 22, wherein said virus is inactivated.

38 The reassortant virus according to claim 22, wherein said virus is provided in a pharmaceutically acceptable carrier or diluent.

39. The virus according to claim 23, wherein said virus is inactivated.

40. The virus according to claim 23, wherein said virus is provided in a pharmaceutically acceptable carrier or diluent.

41. The virus according to claim 24, wherein said virus is inactivated.

42. The virus according to claim 24, wherein said virus is provided in a pharmaceutically acceptable carrier or diluent.

43. The canine influenza virus according to claim 25, wherein said influenza virus is inactivated.

44. The canine influenza virus according to claim 25, wherein said influenza virus is provided in a pharmaceutically acceptable carrier or diluent.

45. The canine influenza virus according to claim 26, wherein said influenza virus is inactivated.

46. The canine influenza virus according to claim 26, wherein said influenza virus is provided in a pharmaceutically acceptable carrier or diluent.

47. The reassortant virus according to claim 27, wherein said virus is inactivated.

48. The reassortant virus according to claim 27, wherein said virus is provided in a pharmaceutically acceptable carrier or diluent.

49. The reassortant virus according to claim 28, wherein said virus is inactivated.

50. The reassortant virus according to claim 28, wherein said virus is provided in a pharmaceutically acceptable carrier or diluent.

51. The virus according to claim 29, wherein said virus is inactivated.

52. The virus according to claim 29, wherein said virus is provided in a pharmaceutically acceptable carrier or diluent.

53. The virus according to claim 30, wherein said virus is inactivated.

54. The virus according to claim 30, wherein said virus is provided in a pharmaceutically acceptable carrier or diluent.

55. The canine influenza virus according to claim 17, wherein said influenza virus is attenuated.

56. The canine influenza virus according to claim 18, wherein said influenza virus is attenuated.

57. The reassortant virus according to claim 21, wherein said virus is attenuated.

58. The reassortant virus according to claim 22, wherein said virus is attenuated.

59. The virus according to claim 23, wherein said virus is attenuated.

60. The virus according to claim 24, wherein said virus is attenuated.

61. The canine influenza virus according to claim 25, wherein said influenza virus is attenuated.

62. The canine influenza virus according to claim 26, wherein said influenza virus is attenuated.

63. The reassortant virus according to claim 27, wherein said virus is attenuated.

64. The reassortant virus according to claim 28, wherein said virus is attenuated.

65. The virus according to claim 29, wherein said virus is attenuated.

66. The virus according to claim 30, wherein said virus is attenuated.

67. A vaccine comprising a canine influenza virus of claims 31 and 55.

68. A vaccine comprising a canine influenza virus of claims 33 and 56.

69. The canine influenza vaccine according to claim 67, wherein said polynucleotide encodes a hemagglutinin (HA) that comprises the amino acid sequence of SEQ ID NO:16, or an amino acid sequence having greater than 95% ammo acid sequence identity to SEQ ID NO:16.

70. The canine influenza vaccine according to claim 68, wherein said hemagglutinin (H-A) comprises the amino acid sequence of SEQ ID NO:16, or an amino acid sequence having greater than 95% ammo acid sequence identity to SEQ ID NO:16.

71. The canine influenza vaccine according to claim 67, wherein said influenza virus is inactivated.

72. The canine influenza vaccine according to claim 67, wherein said influenza virus is attenuated.

73. The canine influenza vaccine according to claim 68, wherein said influenza virus is inactivated.

74. The canine influenza vaccine according to claim 68, wherein said influenza virus is attenuated.

75. The canine influenza vaccine according to claim 69, wherein said influenza virus is inactivated.

76. The canine influenza vaccine according to claim 69, wherein said influenza virus is attenuated.

77. The canine influenza vaccine according to claim 70, wherein said influenza virus is inactivated.

78. The canine influenza vaccine according to claim 70, wherein said influenza virus is attenuated.

79. A canine influenza virus wherein said influenza virus is the viral isolate designated as A/canine/Florida/43/2004 (ATCC Accession No. PTA-7914).

80. A canine influenza virus wherein said influenza virus is the viral isolate designated as A/canine/Florida/242/2003 (ATCC Accession No. PTA-7915).

81. A canine influenza virus wherein said influenza virus is the viral isolate designated as canine/Jax/05 (ATCC Accession No. PTA-7941).

82. A canine influenza virus wherein said influenza virus is the viral isolate designated as canine/Miami/05 (ATCC Accession No. PTA-7940).