Claims:

1. An immunogenic composition comprising at least 2 μg recombinant PCV2 ORF2 protein, wherein said immunogenic composition is effective for lessening the severity of clinical symptoms associated with PCV2 infection when administered in one dose to a pig,
or a one dose immunogenic composition that comprises at least 2 μg recombinant PCV2 ORF2 protein and that is effective for lessening the severity of clinical symptoms associated with PCV2 infection in a pig.

2. The immunogenic composition of claim 1 for use in lessening the severity of clinical symptoms associated with PCV2 infection by administering one dose of said composition to a pig.

3. The immunogenic composition of claim 1 or 2, wherein said recombinant PCV2 ORF2 protein is obtainable by permitting infection of susceptible cells in culture with a recombinant viral vector containing PCV2 ORF2 DNA coding sequences, wherein ORF2 protein is expressed by the recombinant viral vector, and thereafter recovering said ORF2 in the supernate.

4. The immunogenic composition of any one of claims 1 to 3, wherein said recombinant PCV2 ORF2 protein is recombinant baculovirus expressed PCV2 ORF2 protein.

5. The immunogenic composition of claim 4, wherein said immunogenic composition comprises inactivated baculovirus and cell culture supernate.

6. The immunogenic composition of any one of claims 3 to 5, wherein said viral vector is inactivated by addition of BEI.

7. The immunogenic composition of claim 6, wherein said BEI is neutralized with sodium thiosulfate.

8. The immunogenic composition of any one of claims 1 to 7, wherein said immunogenic composition comprises an adjuvant.

9. The immunogenic composition of claim 8, wherein said adjuvant is selected from the group consisting of polymers of acrylic acid or polymers of methacrylic acid.

10. The immunogenic composition of claim 8 or 9, wherein said adjuvant is a carbomer, preferably a Carbopol.

11. The immunogenic composition of any one of claims 8 to 10, wherein said adjuvant comprises about 500 µg to about 5 mg Carbopol per dose.

12. The immunogenic composition of any one of claims 1 to 11, wherein said immunogenic composition comprises 4 µg to 200 µg recombinant PCV2 ORF2 protein per dose.

13. The immunogenic composition of any one of claims 1 to 12, wherein said immunogenic composition is stable over a period of 24 months.

14. The immunogenic composition of any one of claims 1 to 13, wherein said immunogenic composition is effective in the prevention of an infection with PCV-2.

15. The immunogenic composition of any one of claims 1 to 14 for use in a method for the prevention of an infection with PCV-2.

16. The immunogenic composition of any one of claims 1 to 15, wherein said immunogenic composition is to be administered together with an immunogenic composition that comprises Porcine Reproductive and Respiratory Syndrome (PRRS) antigen.

17. The immunogenic composition of claim 16, wherein said PRRS antigen is the antigen included in Ingelvac PRRS MLV.

18. The immunogenic composition of claim 16 or 17, wherein said immunogenic composition is effective in the prevention of PCV2 clinical signs and disease manifestations when a PRRS infection is present.

19. The immunogenic composition of any one of claims 16 to 18 for use in a method for the prevention ofPCV2 clinical signs and disease manifestations when a PRRS infection is present.

20. The immunogenic composition of any one of claims 1 to 19, wherein said immunogenic composition is effective for inducing an immune response against PCV2.

21. The immunogenic composition of any one of claims 1 to 20, wherein said immunogenic composition is in a container.

22. The immunogenic composition of any one of claims 1 to 21, wherein said immunogenic composition is a vaccine.

23. Use of an immunogenic composition that comprises at least 2 μg recombinant PCV2 ORF2 protein for the preparation of a medicament to be administered in one dose to a pig for lessening the severity of clinical symptoms associated with PCV2 infection.

24. The use of claim 23, wherein said recombinant PCV2 ORF2 protein is obtainable by permitting infection of susceptible cells in culture with a recombinant viral vector containing PCV2 ORF2 DNA coding sequences, wherein ORF2 protein is expressed by the recombinant viral vector, and thereafter recovering said ORF2 in the supernate.

25. The use of claim 23 or 24, wherein said recombinant PCV2 ORF2 protein is recombinant baculovirus expressed PCV2 ORF2 protein.

26. The use of any one of claims 23 to 25, wherein said immunogenic composition that comprises at least 2 μg recombinant PCV2 ORF2 protein comprises inactivated baculovirus and cell culture supernate.

27. The use of any one of claims 24-26, wherein said viral vector in said immunogenic composition that comprises recombinant PCV2 ORF2 protein is inactivated by addition of BEI.

28. The use of claim 27, wherein said BEI is neutralized with sodium thiosulfate.

29. The use of any one of claims 23 to 28, wherein said medicament or immunogenic composition that comprises recombinant PCV2 ORF2 protein comprises an adjuvant.

30. The use of claim 29, wherein said adjuvant is selected from the group consisting of polymers of acrylic acid or polymers of methacrylic acid.

31. The use of claim 29 or 30, wherein said adjuvant is a carbomer, preferably a Carbopol.

32. The use of any one of claims 29 to 31, wherein said adjuvant comprises about 500 μg to about 5 mg Carbopol per dose.

33. The use of any one of claims 23 to 32, wherein said immunogenic composition that comprises recombinant PCV2 ORF2 protein comprises 4 μg to 200 μg recombinant PCV2 ORF2 protein per dose.

34. The use of any one of claims 23 to 33, wherein said immunogenic composition that comprises recombinant PCV2 ORF2 protein is stable over a period of 24 months.

35. The use of any one of claims 23 to 34, wherein said medicament is to be administered in one dose to a pig for the prevention of an infection with PCV-2.

36. The use of any one of claims 23 to 35, wherein said medicament is to be administered together with an immunogenic composition that comprises Porcine Reproductive and Respiratory Syndrome (PRRS) antigen.

37. The use of claim 36, wherein said (PRRS) antigen is the antigen included in Ingelvac PRRS MLV.

38. The use of claim 36 or 37, wherein said medicament is to be administered in one dose to a pig for the prevention of PCV2 clinical signs and disease manifestations when a PRRS infection is present.

39. The use of any one of claims 23 to 38, wherein said medicament is to be administered in one dose to a pig for inducing an immune response against PCV2.

40. The use of any one of claims 23 to 39, wherein said medicament is in a container.

41. The use of any one of claims 23 to 40, wherein said medicament is a vaccine.

42. An immunogenic composition comprising at least 2 μg recombinant PCV2 ORF2 protein for use in lessening the severity of clinical symptoms associated with PCV2 infection by administering one dose of said immunogenic composition to a pig.

43. A vaccine comprising at least 2 μg recombinant PCV2 ORF2 protein, wherein said vaccine is for use in a method for effectively lessening the severity of clinical symptoms associated with PCV2 infection when administered as one dose to a pig or a one dose vaccine that comprises at least 2 μg recombinant PCV2 ORF2 protein and that is effective in a method for lessening the severity of clinical symptoms associated with PCV2 infection in a pig.

44. The vaccine of claim 43, wherein said vaccine comprises an adjuvant.

45. The vaccine of claim 43 or 44, wherein said adjuvant is selected from the group consisting of polymers of acrylic acid or polymers of methacrylic acid.

46. The vaccine of claim 44 or 45, wherein said adjuvant is a carbomer, preferably a Carbopol.

47. The vaccine of any one of claims 44 to 46, wherein said adjuvant comprises about 500 µg to about 5 mg Carbopol per dose.

48. The vaccine of any one of claims 43 to 47, wherein said vaccine comprises 4 µg to 200 µg recombinant PCV2 ORF2 protein.

49. A kit comprising a container that comprises at least one dose of an immunogenic composition effective for lessening the severity of clinical symptoms associated with PCV2 infection when administered in one dose to a pig, wherein one dose comprises at least 2 µg recombinant PCV2 ORF2 protein, said kit further comprising an instruction manual including the information for the intramuscular application of said one dose of said immunogenic composition into piglets for lessening of the severity of clinical symptoms associated with PCV2 infection.

50. The kit of claim 49, wherein said recombinant PCV2 ORF2 protein is obtainable by permitting infection of susceptible cells in culture with a recombinant viral vector containing PCV2 ORF2 DNA coding sequences, wherein ORF2 protein is expressed by the recombinant viral vector, and thereafter recovering said ORF2 in the supernate.

51. The kit of claim 49 or 50, wherein said recombinant PCV2 ORF2 protein is recombinant baculovirus expressed PCV2 ORF2 protein.

52. The kit of claim 51, wherein said immunogenic composition comprises inactivated baculovirus and cell culture supernate.

53. The kit of any one of claims 50 to 52, wherein said viral vector is inactivated by addition of BEI.

54. The kit of claim 53, wherein said BEI is neutralized with sodium thiosulfate.

55. The kit of any one of claims 49 to 54, wherein said immunogenic composition comprises an adjuvant.

56. The kit of claim 55, wherein said adjuvant is selected from the group consisting of polymers of acrylic acid or polymers of methacrylic acid.

57. The kit of claim 55 or 56, wherein said adjuvant is a carbomer, preferably a Carbopol.

58. The kit of any one of claims 55 to 57, wherein said adjuvant comprises about 500 µg to about 5 mg Carbopol per dose.

59. The kit of any one of claims 49 to 58, wherein said immunogenic composition comprises 4 µg to 200 µg recombinant PCV2 ORF2 protein per dose.

60. The kit of any one of claims 49 to 59, wherein said immunogenic composition is stable over a period of 24 months.

61. The kit of any one of claims 49 to 60, wherein said immunogenic composition is effective in the prevention of an infection with PCV-2.

62. The kit of any one of claims 49 to 61, wherein said immunogenic composition is to be administered together with an immunogenic composition that comprises Porcine Reproductive and Respiratory Syndrome (PRRS) antigen.

63. The kit of claim 62, wherein said PRRS antigen is the antigen included in Ingelvac PRRS MLV.

64. The kit of claim 62 or 63,, wherein said immunogenic composition is effective in the prevention of PCV2 clinical signs and disease manifestations when a PRRS infection is present.

65. The kit of any one of claims 49 to 64, wherein said immunogenic composition is effective for inducing an immune response against PCV2.

66. The kit of any one of claims 49 to 65, wherein said immunogenic composition is a vaccine.

67. An immunogenic composition comprising at least 2 μg recombinant PCV2 ORF2 protein for use in inducing an immune response against PCV2 by administering one dose of said immunogenic composition to a pig.

68. The immunogenic composition for use according to claim 67, wherein said recombinant PCV2 ORF2 protein is obtainable by permitting infection of susceptible cells in culture with a recombinant viral vector containing PCV2 ORF2 DNA coding sequences, wherein ORF2 protein is expressed by the recombinant viral vector and thereafter recovering said ORF2 in the supernate.

69. The immunogenic composition for use according to claim 67 or 68, wherein said recombinant PCV2 ORF2 protein is a recombinant baculovirus expressed PCV2 ORF2 protein.

70. The immunogenic composition for use according to claim 69, wherein said immunogenic composition comprises inactivated baculovirus and cell culture supernate.

71. The immunogenic composition of any one for use according to claims 68 to 70, wherein said viral vector is inactivated by addition of BEI.

72. The immunogenic composition for use according to claim 71, wherein said BEI is neutralized with sodium thiosulfate.

73. The immunogenic composition for use according to any one of claims 67 to 72, wherein said immunogenic composition comprises an adjuvant.

74. The immunogenic composition for use according to claim 73, wherein said adjuvant is selected from the group consisting of polymers of acrylic acid or polymers of methacrylic acid.

75. The immunogenic composition for use according to claim 73 or 74, wherein said adjuvant is a carbomer, preferably a Carbopol.

76. The immunogenic composition for use according to any one of claims 73 to 75, wherein said adjuvant comprises about 500 µg to about 5 mg Carbopol per dose.

77. The immunogenic composition for use according to any one of claims 67 to 76, wherein said immunogenic composition comprises 4 µg to 200 µg recombinant PCV2 ORF2 protein per dose.

78. The immunogenic composition for use according to any one of claims 67 to 77, wherein said immunogenic composition is stable over a period of 24 months.

79. The immunogenic composition of any one of claims 67 to 78, wherein said immunogenic composition is in a container.

80. The immunogenic composition for use according to any one of claims 67 to 79 wherein said immunogenic composition is to be administered together with an immunogenic composition that comprises Porcine Reproductive and Respiratory Syndrome Virus (PRRS) antigen.

81. The immunogenic composition of claim 80, wherein said PRRS antigen is the antigen included in Ingelvac PRRS MLV.

82. The immunogenic composition for use according to any one of claims 67 to 81, wherein said immunogenic composition is a vaccine.

83. The immunogenic composition for use according to any one of claims 67 to 82 for use in the prevention of infections caused by PCV-2.

84. The immunogenic composition for use according to any one of claims 80 to 83, wherein said immunogenic composition is effective in the prevention of PCV2 clinical signs and disease manifestations when a PRRS infection is present.

85. The immunogenic composition for use according to any one of claims 67 to 84, wherein said immune response is a protective immune response.

86. The immunogenic composition for use according to any one of claims 67 to 84, wherein said immune response is a therapeutic immune response.

87. The immunogenic composition for use according to any one of claims 67 to 86, wherein the immunological composition is effective for reducing or lessening the severity of the clinical symptoms associated with PCV2 infection when administered in one dose to a pig.

88. The immunogenic composition for use according to any one of claims 67 to 87 for use in reducing or lessening the severity of the clinical symptoms associated with PCV2 infection by administering one dose to a pig.

89. The immunogenic composition for use according to claims 87 or 88, wherein the clinical symptoms are selected from the group consisting of gross lesions in pigs with PMWS secondary to PCV2 infection, PMWS, wasting, paleness of the skin, unthriftiness, respiratory distress, diarrhea, icterus, jaundice, microscopic and macroscopic lesions, lesions of lymphoid organs, mortality, and infections including pseudorabies, porcine reproductive and respiratory syndrome (PRRS), Glasser's disease, streptococcal meningitis, salmonellosis, postweaning colibacillosis, dietetic hepatosis, and suppurative bronchopneumonia.

90. The immunogenic composition for use according to claim 89, wherein the gross lesions consist of generalized lymphadenopathy in combination with one or more of the following: (1) interstitial pneumonia with interlobular edema, (2) cutaneous pallor or icterus, (3) mottled atrophic livers, (4) gastric ulcers and (5) nephritis.

91. The immunogenic composition of any one of claims 79 to 90, wherein said immunogenic composition is in a container in a kit comprising an instruction manual including the information for the intramuscular application of one dose of the immunogenic composition of PCV2 ORF2 into piglets, and where said container in said kit also includes a Porcine Reproductive and Respiratory

Syndrome antigen according to claim 80, preferably the antigen included in Ingelvac PRRS MLV according to claim 81, said instruction manual further includes the information to administer the PCV2 ORF2 immunogenic composition together with the immunogenic composition that comprises said PRRS antigen.

92. Use of an immunogenic composition that comprises at least 2 μg recombinant PCV2 ORF2 protein for the preparation of a medicament to be administered in one dose to a pig for inducing an immune response against PCV2.

93. A composition of matter comprising a protein expressed by open reading frame 2 (ORF2) of porcine circovirus type 2 (PCV2), wherein said protein is obtainable by permitting a virus transfected with a viral vector containing recombinant coding sequence for PCV2 ORF2 to infect cells in growth media, and recovering said protein in the supernate, rather than from inside the cells, or said protein is obtainable by permitting infection of susceptible cells in culture with a recombinant viral vector containing PCV2 ORF2 DNA coding sequences, wherein ORF2 protein is expressed by the recombinant virus, and recovering the ORF2 protein from the supernate, or said protein is obtainable by infecting cells in growth media with a recombinant viral vector containing PCV2 open reading frame 2 DNA coding sequences, causing the vector to express the recombinant ORF2 protein coding sequences, and recovering the expressed recombinant protein from the supernate, rather than from the cells.

94. A composition of matter comprising the recombinant protein according to claim 93, wherein said viral vector is a baculovirus vector.

95. A composition of matter comprising the recombinant protein according to claim 93 or 94, wherein the infected cells are incubated over a period of about 5 days to 10 days.

96. A composition of matter of any of claims 93 to 95, wherein said recovering includes an inactivation step in order to inactivate the viral vector.

97. A composition of matter of any of claims 93 to 96, wherein the recovered protein is combined with a suitable adjuvant.

98. A composition of matter of any of claims 93 to 97, wherein the viral vector has been inactivated by the addition of BEI.

99. A composition of matter of any of claims 93 to 98 for use in a method for invoking an immune response against PCV2.

100. Use of a composition of matter of any of claims 93 to 98 for the preparation of a medicament for invoking an immune response against PCV2.

101. A cell culture infected with recombinant viral vectors containing a PCV2 ORF2 DNA and expressing the PCV2 ORF2 protein, wherein said cell culture has a cell count between about 0.3 - 2.0 x $10^6$ cells/mL.

102. The cell culture of claim 101, wherein said cell culture has a cell count from about 0.5 - 1.5 x $10^6$ cells/mL.

103. A recombinant viral vector containing the PCV2 ORF2 DNA sequences, wherein said recombinant viral vector has a multiplicity of infection (MOI) of between about 0.03 - 1.5, when used for the infection of the susceptible cells.

104. The recombinant viral vector of claim 103, wherein said recombinant viral vector has a multiplicity of infection (MOI) of between about 0.1 - 1.0.

105. A method for constructing a recombinant viral vector containing PCV2 ORF2 DNA and expressing PCV2 ORF2 protein, comprising the steps of:

i) amplifying PCV2 ORF2 DNA in vitro, wherein the flanking sequences of said PCV2 ORF2 DNA are modified,

ii) cloning the amplified PCV2 ORF2 DNA into a transfer vector; and

iii) transfecting the transfer vector or a portion thereof containing the recombinant PCV2 ORF2 DNA into a viral vector to generate the recombinant viral vector,

wherein the modification of the flanking sequences of the PCV2 ORF2 DNA in step i) is performed by introducing a 5' Kozak sequence and/or a EcoR 1 site.

106. An inactivation test for determining the effectiveness of the inactivation of a recombination viral vector containing a PCV2 ORF2 DNA, comprises the steps:

i) contacting at least a portion of the culture fluid containing the recombinant viral vector with an inactivating agent,

ii) adding a neutralization agent to neutralize the inactivation agent, and

iii) determining the residual infectivity by an assay, wherein 150 $cm^2$ of appropriate cell culture monolayer is inoculated with 1.0 mL of inactivated PCV2 fluids and maintained at 25 - 29°C for 14 days with at least two passages.

107. The inactivation test of claim 106, wherein, at the end of the maintenance period, the cell monolayers are examined for cytopathogenic effect (CPE) typical of PCV2 ORF2 baculovirus.

108. An immunogenic composition effective for lessening the severity of clinical symptoms associated with PCV2 infection comprising PCV2 ORF2 protein, or an immunogenic portion thereof, wherein said immunogenic portion having at least 10 contiguous amino acids from PCV2 ORF2 protein.

109. The immunogenic composition of claim 108, wherein said PCV2 ORF2 protein is

i) a polypeptide comprising the sequence of SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 9, SEQ ID NO: 10 or SEQ ID NO: 11;

ii) any polypeptide that is at least 80% homolog to the polypeptide of i),

iii) any immunogenic portion of the polypeptides of i) and/or ii)

iv) the immunogenic portion of iii), comprising at least 10 contiguous amino acids included in the sequences of SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID No: 9, SEQ ID No: 10 or SEQ ID No: 11,

v) a polypeptide that is encoded by a DNA comprising the sequence of SEQ ID NO: 3 or SEQ ID NO: 4.

vi) any polypeptide that is encoded by a polynucleotide that is at least 80% homolog to the polynucleotide of v),

vii) any immunogenic portion of the polypeptides encoded by the polynucleotide of v) and/or vi)

viii) the immunogenic portion of vii), wherein polynucleotide coding for said

immunogenic portion comprises at least 30 contiguous nucleotides included in the sequences of SEQ ID No: 3, or SEQ ID No: 4.

110. A container comprises at least one dose of the immunogenic composition of anyone of claims 108 to 109, wherein one dose comprises at least 2 μg PCV2 ORF2 protein.

111. A container comprises 10 to 250 doses of the immunogenic composition of anyone of claims 108 to 109, wherein one dose comprises at least 2 μg PCV2 ORF2 protein.

112. A kit comprises a container of claim 110 and all instruction manual, including the information for the intramuscular application of at least one dose of the immunogenic composition into piglets to lessening the severity of clinical symptoms associated with PCV2 infection.

113. A method of recovering recombinant protein expressed by open reading frame 2 of PCV2 comprising the steps of:

A) cloning said recombinant open reading frame 2 from PCV2 into a transfer vector;

B) transfecting the portion of said transfer vector containing said recombinant open reading frame 2 into a virus;

C) infecting cells in media with said virus;

D) causing said virus to express the protein from said open reading frame 2;

E) separating cells from said vector from the supernate; and

F) recovering said expressed open reading frame 2 protein in said supernate.

114. A method of preparing a composition for invoking an immune response against PCV2, said method comprising the steps of:

i) transfecting a construct into a virus, said construct comprising recombinant DNA from open reading frame 2 of PCV2;

ii) infecting cells with said transfected virus, said cells being in a growth media;

iii) causing said virus to express the recombinant protein from said open reading frame 2;

iv) recovering said expressed open reading frame 2 protein in the supernate; and

v) combining said recovered protein with a suitable adjuvant or other pharmaceutically acceptable carrier or excipient.

115. A method of recovering the protein expressed by open reading frame 2 from PCV2, wherein said method including the steps

i) infecting cells in growth media with a recombinant viral vector containing said open reading frame 2;

ii) causing said vector to express said protein; and

iii) recovering said expressed protein in the supernate.

116. A composition of matter obtained by a method selected from the group consisting of the methods of claim 113, claim 114, claim 115, and combinations thereof.

117. The use of the composition of claim 116 as a medicament.

Claims:

1. An immunogenic composition comprising 4-400 μg recombinant PCV2 ORF2 protein, for use in lessening the severity of clinical symptoms associated with PCV2 infection wherein said immunogenic composition is to be administered once in one dose to a pig, or a one dose immunogenic composition that comprises 4-400 μg recombinant PCV2 ORF2 protein and that is effective for lessening the severity of clinical symptoms associated with PCV2 infection in a pig when administered once.

2. The immunogenic composition of claim 1, for use in lessening the severity of clinical symptoms associated with PCV2 infection by administering one dose of said composition to a pig.

3. The immunogenic composition of claim 1 or 2, wherein said recombinant PCV2 ORF2 protein is obtainable by permitting infection of susceptible cells in culture with a recombinant viral vector containing PCV2 ORF2 DNA coding sequences, wherein ORF2 protein is expressed by the recombinant viral vector, and thereafter recovering said ORF2 in the supernate.

4. The immunogenic composition of any one of claims 1 to 3, wherein said recombinant PCV2 ORF2 protein is recombinant baculovirus expressed PCV2 ORF2 protein.

5. The immunogenic composition of claim 4, wherein said immunogenic composition comprises inactivated baculovirus and cell culture supernate.

6. The immunogenic composition of any one of claims 3 to 5, wherein said viral vector is inactivated by addition of BEI.

7. The immunogenic composition of claim 6, wherein said BEI is neutralized with sodium thiosulfate.

8. The immunogenic composition of any one of claims 1 to 7, wherein said immunogenic composition comprises an adjuvant.

9. The immunogenic composition of claim 8, wherein said adjuvant is selected from the group consisting of polymers of acrylic acid or polymers of methacrylic acid.

10. The immunogenic composition of claim 8 or 9, wherein said adjuvant is a carbomer, preferably a Carbopol.

11. The immunogenic composition of any one of claims 8 to 10, wherein said adjuvant comprises 500 μg to 5 mg Carbopol per dose.

12. The immunogenic composition of any one of claims 1 to 11, wherein said immunogenic composition comprises 4 μg to 200 μg recombinant PCV2 ORF2 protein per dose.

13. The immunogenic composition of any one of claims 1 to 12, wherein said immunogenic composition is effective in the prevention of an infection with PCV2.

14. The immunogenic composition of any one of claims 1 to 13 for use in a method for the prevention of an infection with PCV-2.

15. The immunogenic composition of any one of claims 1 to 14, wherein said immunogenic composition is to be administered together with an immunogenic composition that comprises Porcine Reproductive and Respiratory Syndrome (PRRS) antigen.

16. The immunogenic composition of claim 15, wherein said immunogenic composition is effective in the prevention of PCV2 clinical signs and disease manifestations when a PRRS infection is present.

17. The immunogenic composition of claim 15 or 16, for use in a method for the prevention of PCV2 clinical signs and disease manifestations when a PRRS infection is present.

18. The immunogenic composition of any one of claims 1 to 17, wherein said immunogenic composition is effective for inducing an immune response against

PCV2.

19. The immunogenic composition of any one of claims 1 to 18, wherein said immunogenic composition is in a container.

20. Use of an immunogenic composition that comprises 4-400 μg recombinant PCV2 ORF2 protein for the preparation of a medicament to be administered once in one dose to a pig for lessening the severity of clinical symptoms associated with PCV2 infection.

21. The use of claim 20, wherein said recombinant PCV2 ORF2 protein is obtainable by permitting infection of susceptible cells in culture with a recombinant viral vector containing PCV2 ORF2 DNA coding sequences, wherein ORF2 protein is expressed by the recombinant viral vector, and thereafter recovering said ORF2 in the supernate.

22. The use of claim 20 or 21, wherein said recombinant PCV2 ORF2 protein is recombinant baculovirus expressed PCV2 ORF2 protein.

23. The use of any one of claims 20 to 22, wherein said immunogenic composition comprises inactivated baculovirus and cell culture supernate.

24. The use of any one of claims 21 to 23, wherein said viral vector in said immunogenic composition that comprises recombinant PCV2 ORF2 protein is inactivated by addition of BEI.

25. The use of claim 24, wherein said BEI is neutralized with sodium thiosulfate.

26. The use of any one of claims 22 to 25, wherein said medicament or immunogenic composition that comprises recombinant PCV2 ORF2 protein comprises an adjuvant.

27. The use of claim 26, wherein said adjuvant is selected from the group consisting of polymers of acrylic acid or polymers of methacrylic acid.

28. The use of claim 26 or 27, wherein said adjuvant is a carbomer, preferably a

Carbopol.

29. The use of any one of claims 26 to 28, wherein said adjuvant comprises 500 μg to 5 mg Carbopol per dose.

30. The use of any one of claims 20 to 29, wherein said immunogenic composition that comprises recombinant PCV2 ORF2 protein comprises 4 μg to 200 μg recombinant PCV2 ORF2 protein per dose.

31. The use of any one of claims 20 to 30, wherein said medicament is to be administered in one dose to a pig for the prevention of an infection with PCV-2.

32. The use of any one of claims 20 to 31, wherein said medicament is to be administered together with an immunogenic composition that comprises Porcine Reproductive and Respiratory Syndrome (PRRS) antigen.

33. The use of claim 32, wherein said medicament is to be administered once in one dose to a pig for the prevention of PCV2 clinical signs and disease manifestations when a PRRS infection is present.

34. The use of any one of claims 20 to 33, wherein said medicament is to be administered in one dose to a pig for inducing an immune response against PCV2.

35. A vaccine comprising 4-400 μg recombinant PCV2 ORF2 protein, wherein said vaccine is for use in a method for effectively lessening the severity of clinical symptoms associated with PCV2 infection when administered once as one dose to a pig.

36. The vaccine of claim 35, wherein said vaccine comprises an adjuvant.

37. The vaccine of claim 35 or 36, wherein said adjuvant is selected from the group consisting of polymers of acrylic acid or polymers of methacrylic acid.

38. The vaccine of claim 36 or 37, wherein said adjuvant is a carbomer, preferably a

Carbopol.

39. The vaccine of any one of claims 36 to 38, wherein said adjuvant comprises 500 μg to 5 mg Carbopol per dose.

40. The vaccine of any one of claims 35 to 39, wherein said vaccine comprises 4 μg to 200 μg recombinant PCV2 ORF2 protein.

41. A kit comprising a container that comprises at least one dose of an immunogenic composition effective for lessening the severity of clinical symptoms associated with PCV2 infection when administered once in one dose to a pig, wherein one dose comprises 4-400 μg recombinant PCV2 ORF2 protein, said kit further comprising an instruction manual including the information for the intramuscular application of said one dose once of said immunogenic composition per piglet for lessening of the severity of clinical symptoms associated with PCV2 infection.

42. The kit of claim 41, wherein said recombinant PCV2 ORF2 protein is obtainable by permitting infection of susceptible cells in culture with a recombinant viral vector containing PCV2 ORF2 DNA coding sequences, wherein ORF2 protein is expressed by the recombinant viral vector, and thereafter recovering said ORF2 in the supernate.

43. The kit of claim 41 or 42, wherein said recombinant PCV2 ORF2 protein is recombinant baculovirus expressed PCV2 ORF2 protein.

44. The kit of claim 43, wherein said immunogenic composition comprises inactivated baculovirus and cell culture supernate.

45. The kit of any one of claims 42 to 44, wherein said viral vector is inactivated by addition of BEI.

46. The kit of claim 45, wherein said BEI is neutralized with sodium thiosulfate.

47. The kit of any one of claims 41 to 46, wherein said immunogenic composition comprises an adjuvant.

48. The kit of claim 47, wherein said adjuvant is selected from the group consisting of polymers of acrylic acid or polymers of methacrylic acid.

49. The kit of claim 47 or 48, wherein said adjuvant is a carbomer, preferably a Carbopol.

50. The kit of any one of claims 47 to 49, wherein said adjuvant comprises 500 μg to 5 mg Carbopol per dose.

51. The kit of claims 49 or 50, wherein said immunogenic composition comprises 4 μg to 200 μg recombinant PCV2 ORF2 protein per dose.

52. The kit of any one of claims 41 to 51, wherein said immunogenic composition is effective in the prevention of an infection with PCV-2.

53. The kit of any one of claims 41 to 52, wherein said immunogenic composition is to be administered together with an immunogenic composition that comprises Porcine Reproductive and Respiratory Syndrome (PRRS) antigen.

54. The kit of claim 53, wherein said immunogenic composition is effective in the prevention of PCV2 clinical signs and disease manifestations when a PRRS infection is present.

55. The kit of any one of claims 41 to 54, wherein said immunogenic composition is effective for inducing an immune response against PCV2.

56. The kit of any one of claims 41 to 55, wherein said immunogenic composition is a vaccine.

57. An immunogenic composition comprising 4-400 μg recombinant PCV2 ORF2 protein for use in inducing an immune response against PCV2 by the administration of only one dose of said immunogenic composition to a pig.

58. The immunogenic composition for use according to claim 57, wherein said recombinant PCV2 ORF2 protein is obtainable by permitting infection of susceptible

cells in culture with a recombinant viral vector containing PCV2 ORF2 DNA coding sequences, wherein ORF2 protein is expressed by the recombinant viral vector and thereafter recovering said ORF2 in the supernate.

59. The immunogenic composition for use according to claim 57 or 58, wherein said recombinant PCV2 ORF2 protein is a recombinant baculovirus expressed PCV2 ORF2 protein.

60. The immunogenic composition for use according to claim 59, wherein said immunogenic composition comprises inactivated baculovirus and cell culture supernate.

61. The immunogenic composition of any one for use according to claims 58 to 61, wherein said viral vector is inactivated by addition of BEI.

62. The immunogenic composition for use according to claim 61, wherein said BEI is neutralized with sodium thiosulfate.

63. The immunogenic composition for use according to any one of claims 57 to 63, wherein said immunogenic composition comprises an adjuvant.

64. The immunogenic composition for use according to claim 63, wherein said adjuvant is selected from the group consisting of polymers of acrylic acid or polymers of methacrylic acid.

65. The immunogenic composition for use according to claim 63 or 64, wherein said adjuvant is a carbomer, preferably a Carbopol.

66. The immunogenic composition for use according to any one of claims 63 to 65, wherein said adjuvant comprises 500 µg to 5 mg Carbopol per dose.

67. The immunogenic composition for use according to any one of claims 57 to 66, wherein said immunogenic composition comprises 4 µg to 200 µg recombinant PCV2 ORF2 protein per dose.

68. The immunogenic composition for use according to any one of claims 57 to 67, wherein said immunogenic composition is to be administered together with an immunogenic composition that comprises Porcine Reproductive and Respiratory Syndrome Virus (PRRS) antigen.

69. The immunogenic composition for use according to any one of claims 57 to 68, for use in the prevention of infections caused by PCV-2.

70. The immunogenic composition for use according to claims 68, or 69, wherein said immunogenic composition is effective in the prevention of PCV2 clinical signs and disease manifestations when a PRRS infection is present.

71. The immunogenic composition for use according to any one of claims 57 to 70, wherein said immune response is a protective immune response.

72. The immunogenic composition for use according to any one of claims 57 to 70, wherein said immune response is a therapeutic immune response.

73. The immunogenic composition for use according to any one of claims 57 to 72, wherein the immunological composition is effective for reducing or lessening the severity of the clinical symptoms associated with PCV2 infection when administered in one dose to a pig.

74. The immunogenic composition for use according to any one of claims 57 to 73, for use in reducing or lessening the severity of the clinical symptoms associated with PCV2 infection by the administration of one dose once to a pig.

75. The immunogenic composition for use according to claims 73 or 74, wherein the clinical symptoms are selected from the group consisting of gross lesions in pigs with PMWS secondary to PCV2 infection, PMWS, wasting, paleness of the skin, unthriftiness, respiratory distress, diarrhea, icterus, jaundice, microscopic and macroscopic lesions, lesions of lymphoid organs, mortality, and infections including pseudorabies, porcine reproductive and respiratory syndrome (PRRS), Glasser's disease, streptococcal meningitis, salmonellosis, postweaning colibacillosis, dietetic

hepatosis, and suppurative bronchopneumonia.

76. The immunogenic composition for use according to claim 75, wherein the gross lesions consist of generalized lymphadenopathy in combination with one or more of the following: (1) interstitial pneumonia with interlobular edema, (2) cutaneous pallor or icterus, (3) mottled atrophic livers, (4) gastric ulcers and (5) nephritis.

77. The immunogenic composition of any one of claims 68 to 76, wherein said immunogenic composition is in a container in a kit comprising an instruction manual including the information for the intramuscular application of one dose of the immunogenic composition of PCV2 ORF2 into piglets, and where said container in said kit also includes a Porcine Reproductive and Respiratory Syndrome antigen according to claim 69, said instruction manual further includes the information to administer the PCV2 ORF2 immunogenic composition together with the immunogenic composition that comprises said PRRS antigen.

78. Use of an immunogenic composition that comprises 4-400 μg recombinant PCV2 ORF2 protein for the preparation of a medicament to be administered once in one dose to a pig for inducing an immune response against PCV2.

79. A composition of matter comprising a protein expressed by open reading frame 2 (ORF2) of porcine circovirus type 2 (PCV2), wherein said protein is obtainable by permitting a virus transfected with a viral vector containing recombinant coding sequence for PCV2 ORF2 to infect cells in growth media, and recovering said protein in the supernate, rather than from inside the cells, or said protein is obtainable by permitting infection of susceptible cells in culture with a recombinant viral vector containing PCV2 ORF2 DNA coding sequences, wherein ORF2 protein is expressed by the recombinant virus, and recovering the ORF2 protein from the supernate, or said protein is obtainable by infecting cells in growth media with a recombinant viral vector containing PCV2 open reading frame 2 DNA coding sequences, causing the vector to express the recombinant ORF2 protein coding sequences, and recovering the expressed recombinant protein from the supernate, rather than from the cells.