

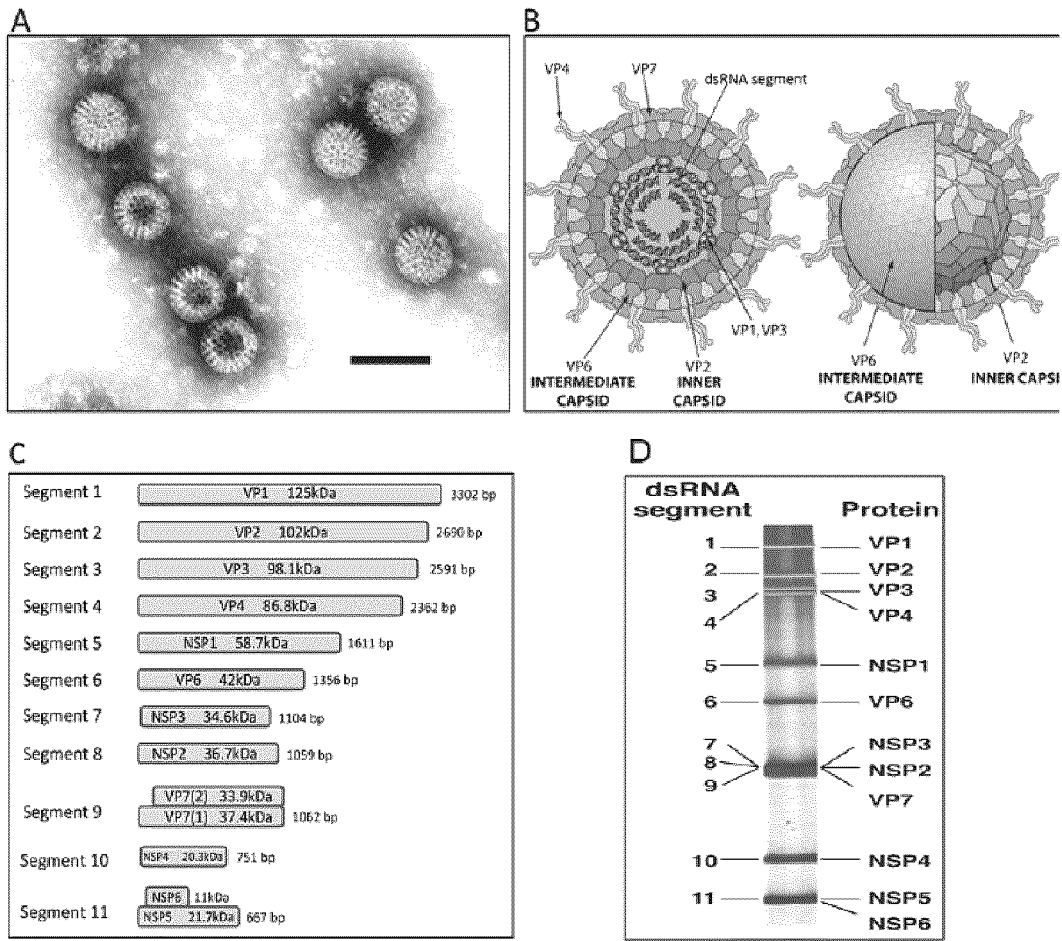


Figure 1

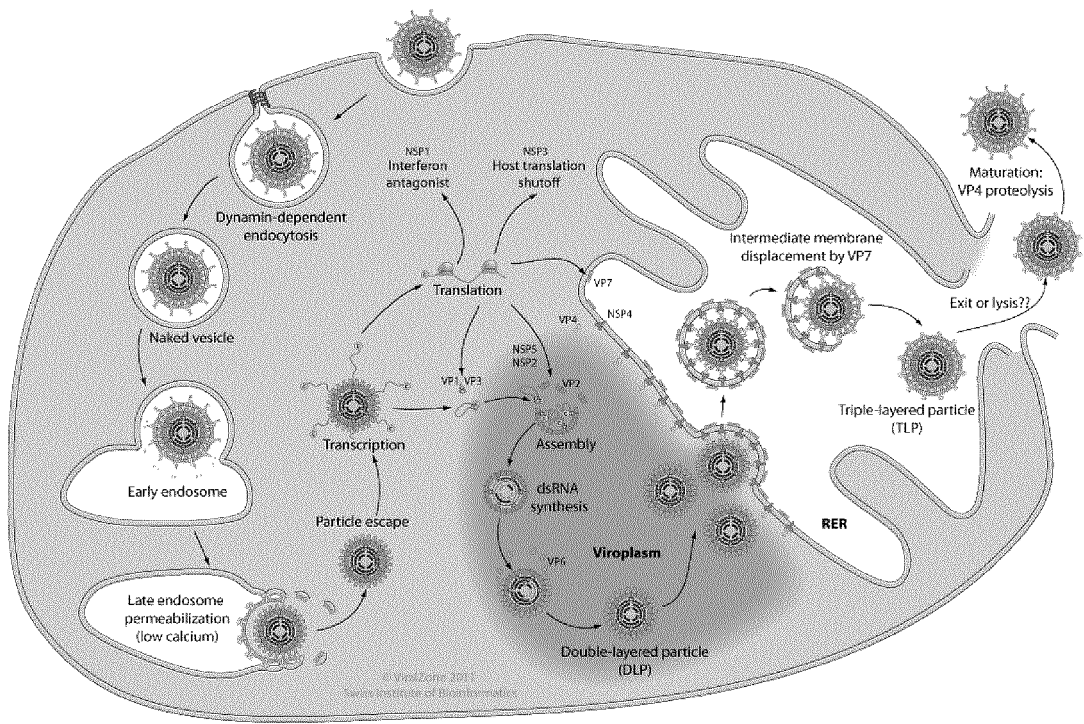


Figure 2

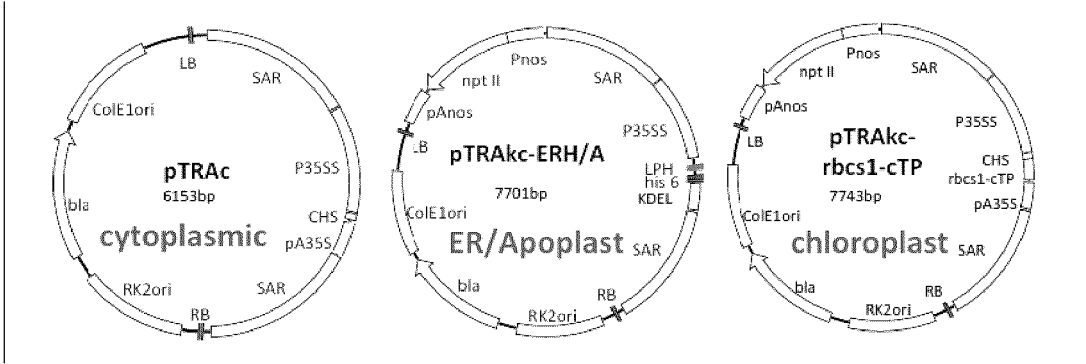
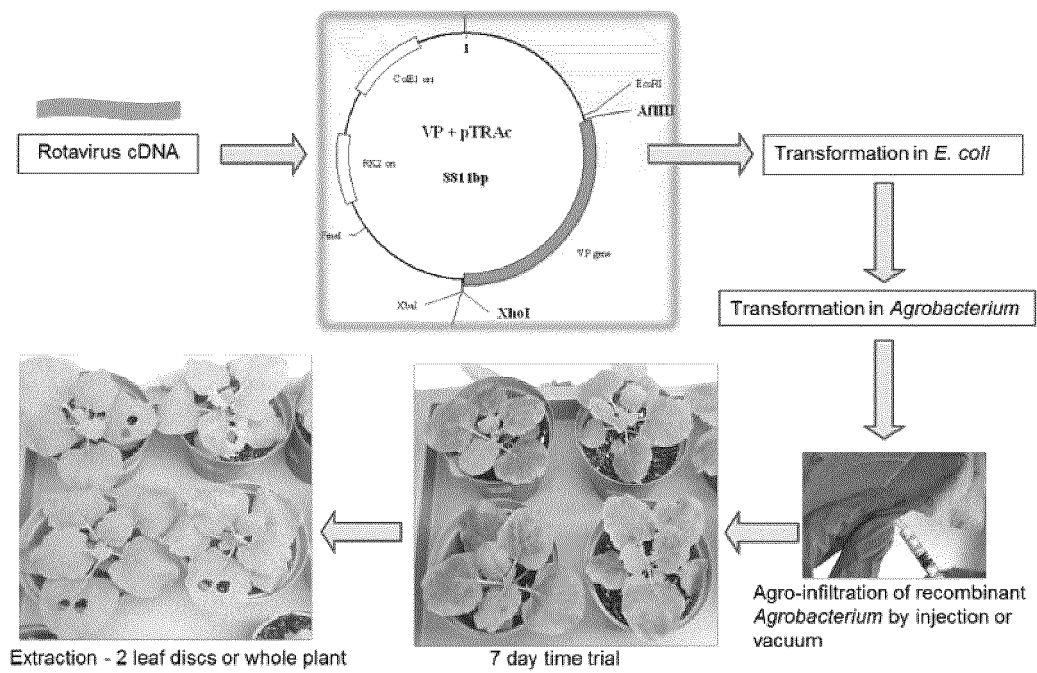


Figure 3

**Figure 4**

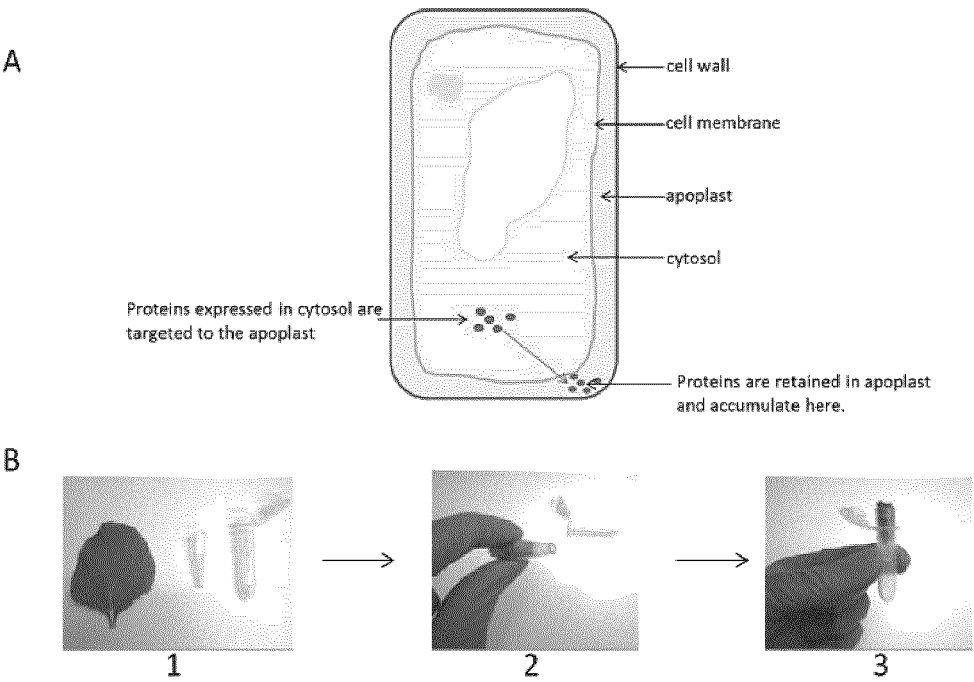


Figure 5

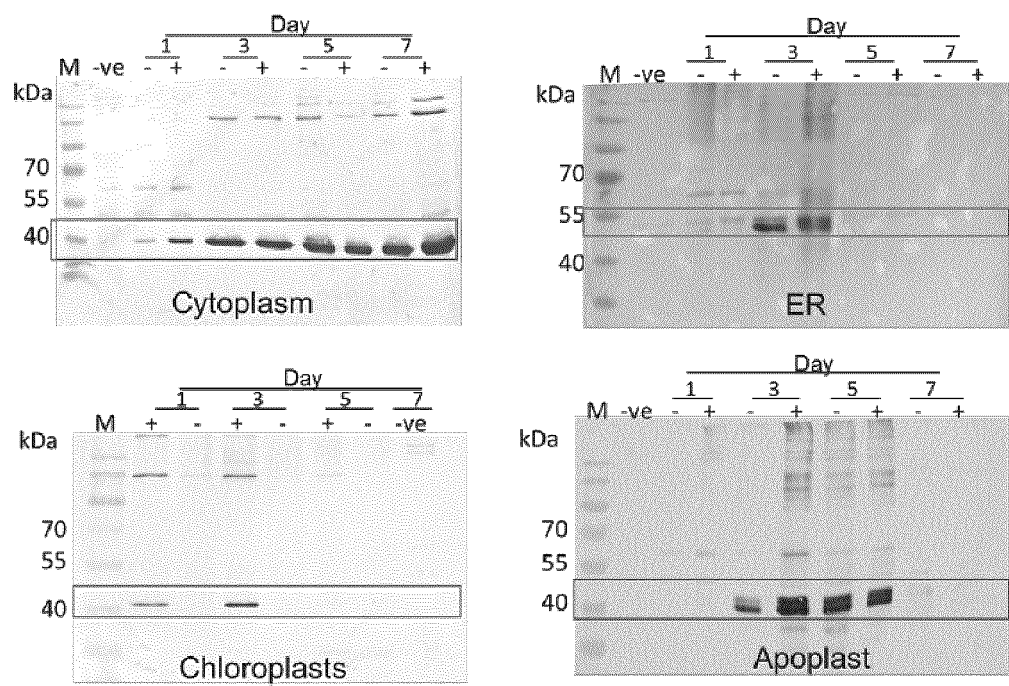


Figure 6

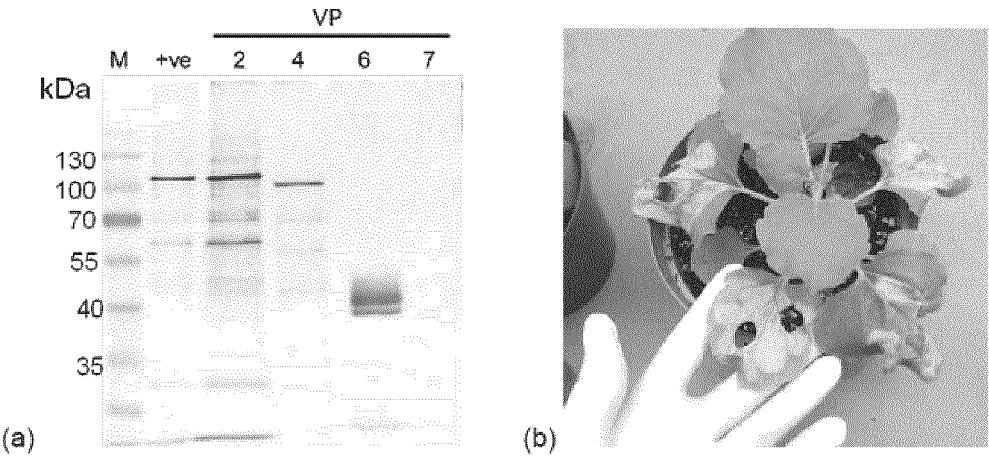


Figure 7

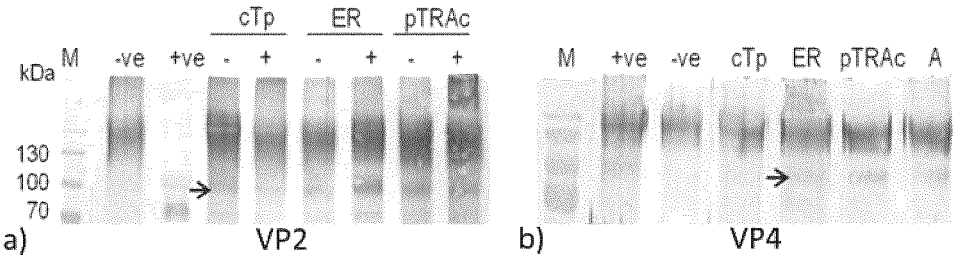


Figure 8

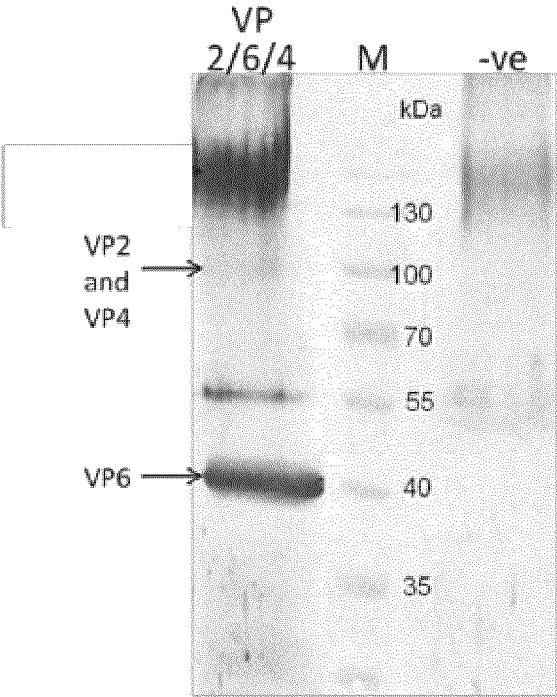


Figure 9

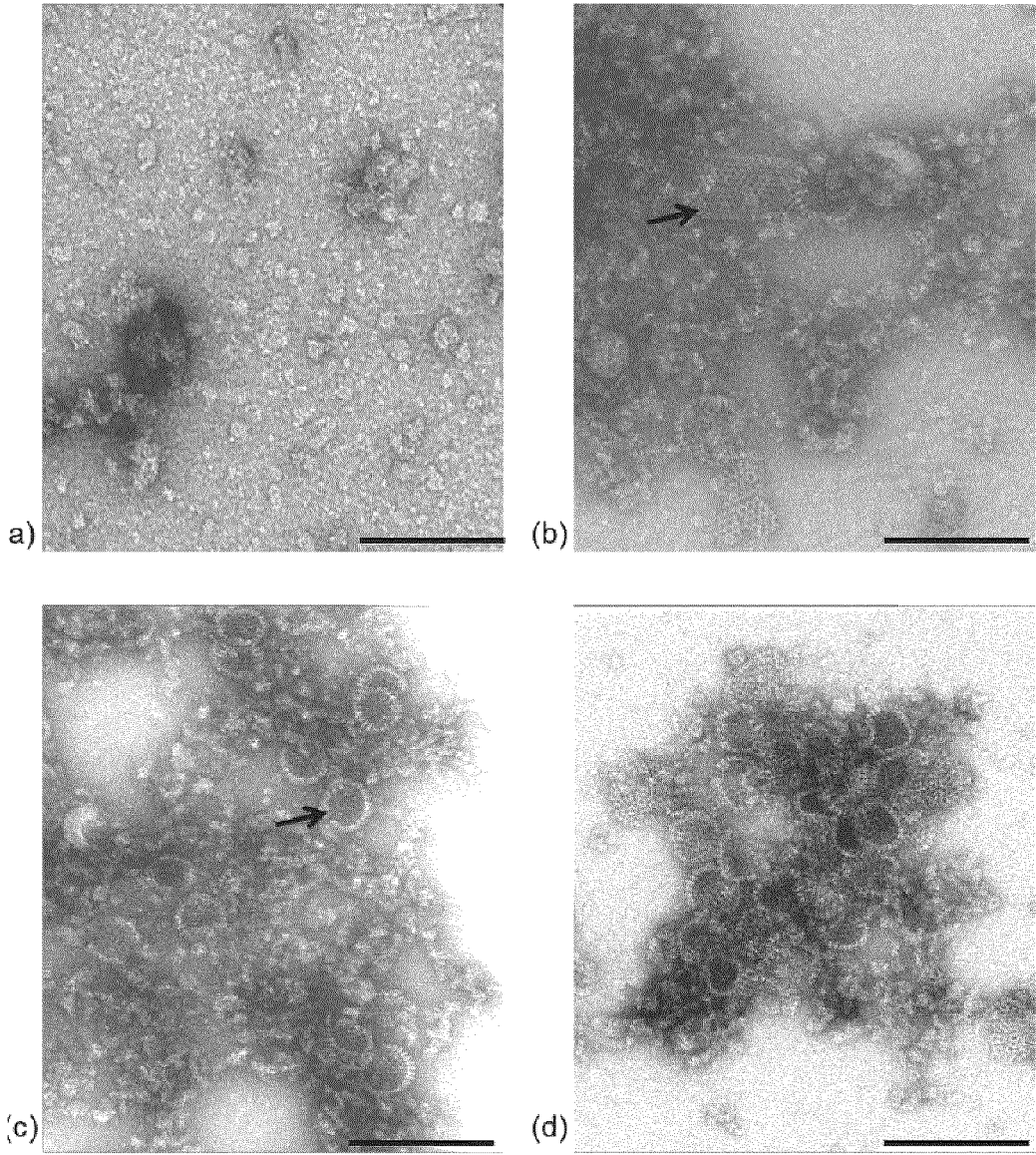


Figure 10

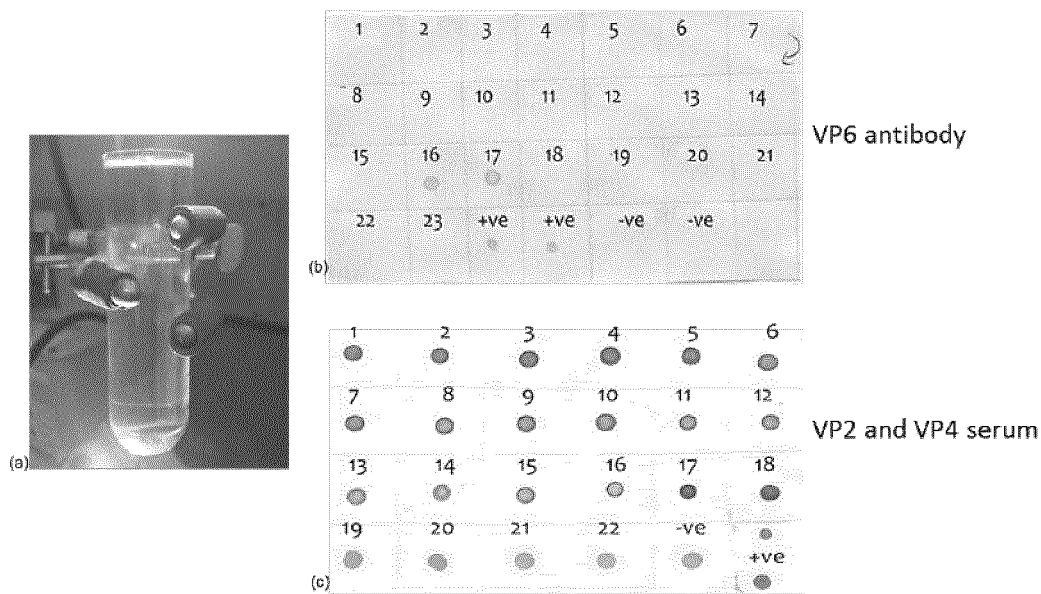


Figure 11

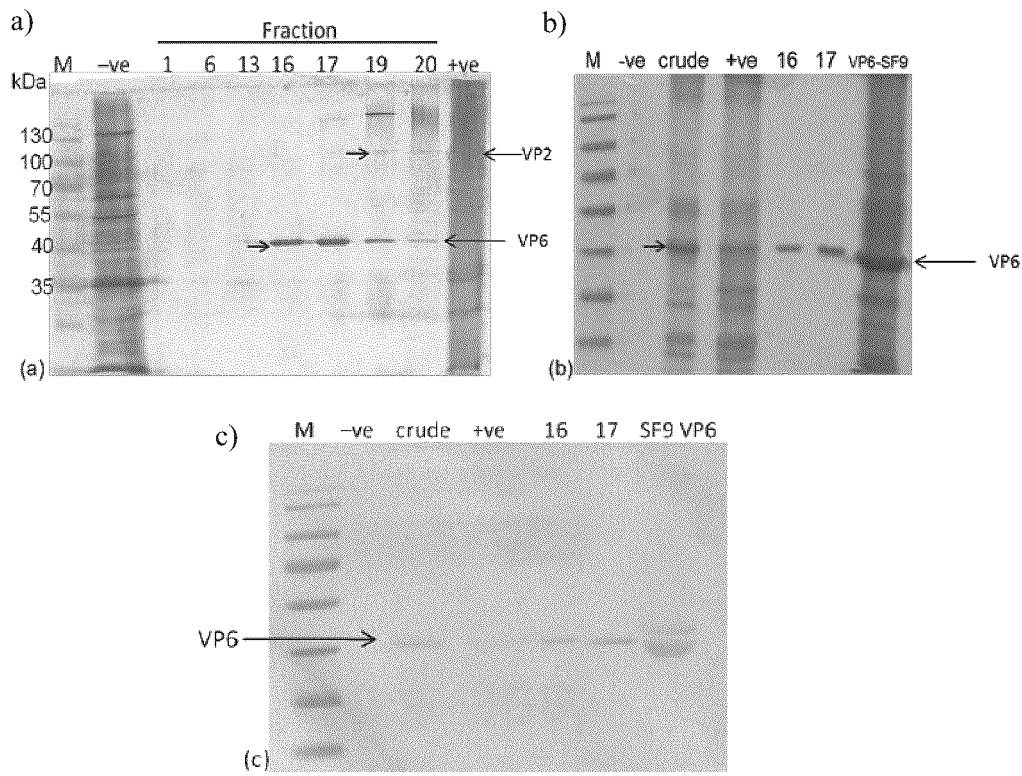


Figure 12

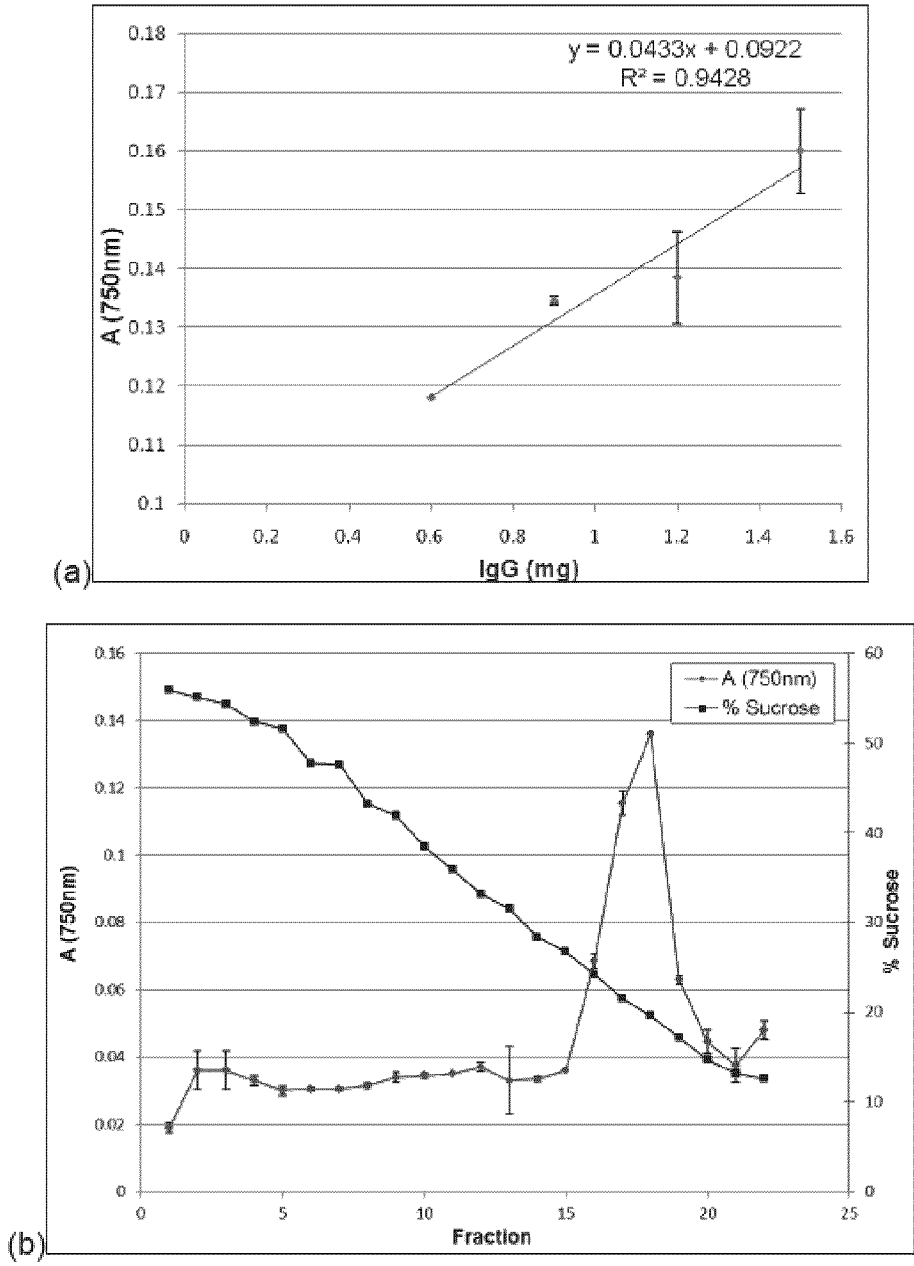


Figure 13

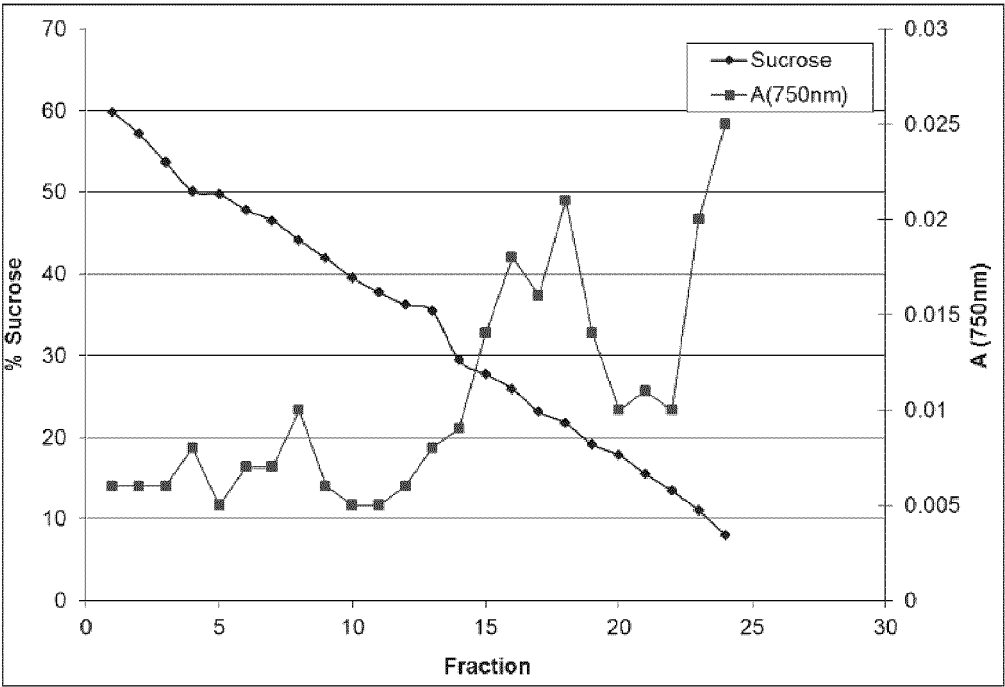


Figure 14

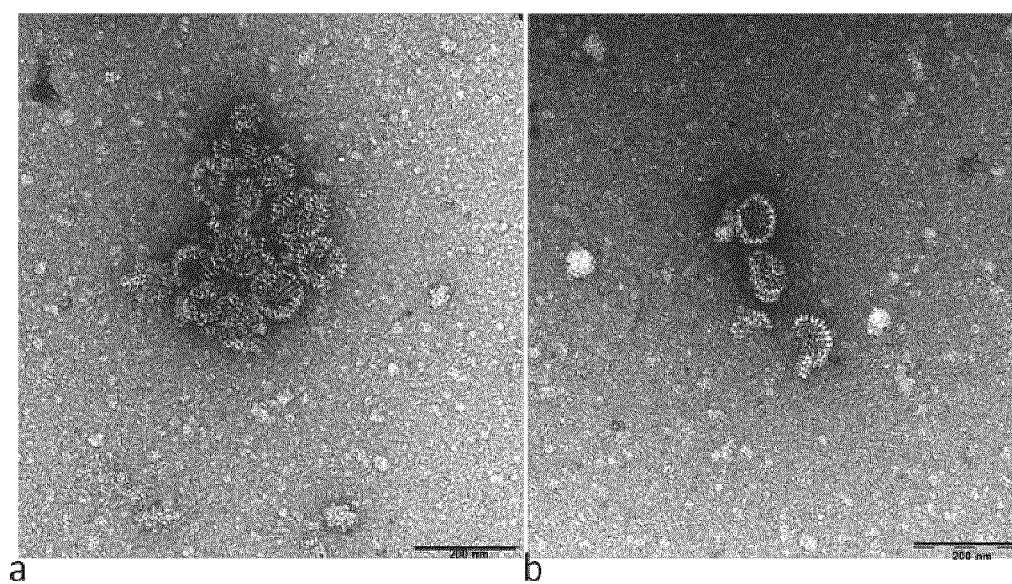


Figure 15

Figure 16A -1**Rotavirus VP2**Gene Name: **G9P6_VP2**

Gene length: 2700 bp

Optimized for expression in: *Nicotiana tabacum*

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1  GGTACCGAATTCGGACGCGTTCGTTCCATGGCTTACCGTAAAAGGGTGCTAGGCGTGAA
   -----+-----+-----+-----+-----+-----+
   CCATGGCTTAAGCCTGCGCAAGCAAGGTACCGAATGGCATTTCACGATCCGCACTT
   SEQ ID NO:1 G_R_V_R_S_M_A_Y_R_K_R_G_A_R_R_E_

61  GCTAACCTCAACAACAACGATAGGATGCAAGAGAAGATCGATGAGAAGCAGGATTCCAAC
   -----+-----+-----+-----+-----+-----+
   CGATTGGAGTTGTTGTTGCTATCCTACGTTCTCTTCTAGCTACTCTTCGTCCTAAGGTTG
   A_N_L_N_N_N_D_R_M_Q_E_K_I_D_E_K_Q_D_S_N_

121 AAGATCCAGCTCTCCGATAAGGTGCTCTCCAAGAAAGAAGAGATCGTTACTGATTCCCAC
   -----+-----+-----+-----+-----+-----+
   TTCTAGGTCGAGAGGCTATTCCACGAGAGGTTCTTTCTTCTCTAGCAATGACTAAGGGTG
   K_I_Q_L_S_D_K_V_L_S_K_K_E_E_I_V_T_D_S_H_

181 GAAGAGGTGAAGGTGACAGATGAGCTTAAGAAGTCCACAAAAGAAGAGTCCAAGCAGCTC
   -----+-----+-----+-----+-----+-----+
   CTTCTCCACTTCCACTGTCTACTCGAATTCTTCAGGTGTTTTCTTCTCAGGTTCTGTCGAG
   E_E_V_K_V_T_D_E_L_K_K_S_T_K_E_E_S_K_Q_L_

241 CTTGAGGTGCTCAAGACAAAAGAGGAACACCAGAAAGAGATCCAGTACGAGATCCTCCAA
   -----+-----+-----+-----+-----+-----+
   GAACTCCACGAGTTCTGTTTTCTCCTTGTGGTCTTTCTCTAGGTCATGCTCTAGGAGGTT
   L_E_V_L_K_T_K_E_E_H_Q_K_E_I_Q_Y_E_I_L_Q_

```

Figure 16A -2

AAGACTATCCCAACTTTTCGAGCCAAAAGAGACTATCCTCAGGAAGCTTGAGGATATCCAG
 301 -----+-----+-----+-----+-----+-----+
 TTCTGATAGGGTTGAAAGCTCGGTTTTCTCTGATAGGAGTCCTTCGAACTCCTATAGGTC
K _ T _ I _ P _ T _ F _ E _ P _ K _ E _ T _ I _ L _ R _ K _ L _ E _ D _ I _ Q _

CCAGAGCTTGCTAAGAAGCAGACTAAGCTCTTCAGGATCTTCGAGCCAAAGCAGCTCCCA
 361 -----+-----+-----+-----+-----+-----+
 GGTCTCGAACGATTCTTCGTCTGATTTCGAGAAGTCCTAGAAGCTCGGTTTCGTTCGAGGGT
P _ E _ L _ A _ K _ K _ Q _ T _ K _ L _ F _ R _ I _ F _ E _ P _ K _ Q _ L _ P _

ATCTACCGTGCTAACGGTGAAAGGGAACCTAGGAACAGGTGGTACTGGAAGCTCAAGAAG
 421 -----+-----+-----+-----+-----+-----+
 TAGATGGCAGGATTGCCACTTTCCCTTGAATCCTTGTCACCATGACCTTCGAGTTCTTC
I _ Y _ R _ A _ N _ G _ E _ R _ E _ L _ R _ N _ R _ W _ Y _ W _ K _ L _ K _ K _

GATACTCTCCCAGACGGTGATTACGATGTGAGAGAGTACTTCCTCAACCTCTACGATCAG
 481 -----+-----+-----+-----+-----+-----+
 CTATGAGAGGGTCTGCCACTAATGCTACACTCTCTCATGAAGGAGTTGGAGATGCTAGTC
D _ T _ L _ P _ D _ G _ D _ Y _ D _ V _ R _ E _ Y _ F _ L _ N _ L _ Y _ D _ Q _

GTGCTCACTGAGATGCCAGATTACCTCCTCCTCAAGGATATGGCTGTGGAGAACAAGAAC
 541 -----+-----+-----+-----+-----+-----+
 CACGAGTGACTCTACGGTCTAATGGAGGAGGAGTTCTTATACCGACACCTCTTGTTCCTG
V _ L _ T _ E _ M _ P _ D _ Y _ L _ L _ L _ K _ D _ M _ A _ V _ E _ N _ K _ N _

TCCAGGGATGCTGGAAAGGTGGTGGATTCCGAGACTGCTTCCATCTGTGATGCTATCTTC
 601 -----+-----+-----+-----+-----+-----+
 AGGTCCCTACGACCTTTCCACCACCTAAGGCTCTGACGAAGGTAGACACTACGATAGAAG
S _ R _ D _ A _ G _ K _ V _ V _ D _ S _ E _ T _ A _ S _ I _ C _ D _ A _ I _ F _

CAGGATGAAGAGACTGAGGGTGCTGTGAGGCGTTTCATTGCTGAGATGAGGCAGAGGGTT
 661 -----+-----+-----+-----+-----+-----+
 GTCCTACTTCTCTGACTCCACGACACTCCGCAAAGTAACGACTCTACTCCGTCTCCCAA
Q _ D _ E _ E _ T _ E _ G _ A _ V _ R _ R _ F _ I _ A _ E _ M _ R _ Q _ R _ V _

CAGGCTGATAGGAACGTGGTGAACCTACCCATCCATCCTCCACCCAATCGATTACGCTTTC
 721 -----+-----+-----+-----+-----+-----+
 GTCCGACTATCCTTGCACTTGTGAGGTTAGGTAGGAGGTGGGTTAGCTAATGCGAAAG
Q _ A _ D _ R _ N _ V _ V _ N _ Y _ P _ S _ I _ L _ H _ P _ I _ D _ Y _ A _ F _

AACGAGTACTTCTTCAGCACCAGCTTGTGGAGCCACTCAACAACGATATCATCTTCAAC
 781 -----+-----+-----+-----+-----+-----+
 TTGCTCATGAAGGAAGTCGTGGTCGAACACCTCGGTGAGTTGTTGCTATAGTAGAAGTTG
N _ E _ Y _ F _ L _ Q _ H _ Q _ L _ V _ E _ P _ L _ N _ N _ D _ I _ I _ F _ N _

Figure 16A -3

TACATCCCAGAGAGGATTAGGAACGACGTTAACTACATCCTCAACATGGATAGGAACCTC
 841 -----+-----+-----+-----+-----+-----+
 ATGTAGGGTCTCTCCTAATCCTTGCTGCAATTGATGTAGGAGTTGTACCTATCCTTGGAG
Y_I_P_E_R_I_R_N_D_V_N_Y_I_L_N_M_D_R_N_L

CCATCCACTGCTCGTTACATCAGGCCAAACCTCCTCCAGGATAGGCTCAACCTCCACGAT
 901 -----+-----+-----+-----+-----+-----+
 GGTAGGTGACGAGCAATGTAGTCCGGTTTGGAGGAGGTCCTATCCGAGTTGGAGGTGCTA
P_S_T_A_R_Y_I_R_P_N_L_L_Q_D_R_L_N_L_H_D

AACTTCGAGTCCCTCTGGGATACAATCACTACTTCCAACATACATTCTCGCTCGTTCCGTG
 961 -----+-----+-----+-----+-----+-----+
 TTGAAGCTCAGGGAGACCCTATGTTAGTGATGAAGGTTGATGTAAGAGCGAGCAAGGCAC
N_F_E_S_L_W_D_T_I_T_T_S_N_Y_I_L_A_R_S_V

GTGCCAGATCTCAAAGAACTCGTGTCCACTGAGGCTCAGATCCAGAAGATGTCCCAGGAT
 1021 -----+-----+-----+-----+-----+-----+
 CACGGTCTAGAGTTTCTTGAGCACAGGTGACTCCGAGTCTAGGTCTTCTACAGGGTCCTA
V_P_D_L_K_E_L_V_S_T_E_A_Q_I_Q_K_M_S_Q_D

CTCCAGCTTGAGGCTCTCACTATCCAGTCCGAGACTCAGTTCCTCACTGGTATCAACTCC
 1081 -----+-----+-----+-----+-----+-----+
 GAGGTGCAACTCCGAGAGTGATAGGTGAGGCTCTGAGTCAAGGAGTGACCATAGTTGAGG
L_Q_L_E_A_L_T_I_Q_S_E_T_Q_F_L_T_G_I_N_S

CAGGCTGCTAACGATTGCTTCAAGACTCTCATTGCTGCTATGCTCTCCCAGAGGACTATG
 1141 -----+-----+-----+-----+-----+-----+
 GTCCGACGATTGCTAACGAAGTTCTGAGAGTAACGACGATACGAGAGGGTCTCCTGATAC
Q_A_A_N_D_C_F_K_T_L_I_A_A_M_L_S_Q_R_T_M

TCCCTCGATTTCTGTGACTACTAACTATATGTCCCTCATCTCCGGAATGTGGCTCTTGACT
 1201 -----+-----+-----+-----+-----+-----+
 AGGGAGCTAAAGCACTGATGATTGATATACAGGGAGTAGAGGCCTTACACCGAGAACTGA
S_L_D_F_V_T_T_N_Y_M_S_L_I_S_G_M_W_L_L_T

GTGGTGCCAAACGATATGTTTCATCCGTGAGTCCCTTGTGGCTTGCCAGCTCGCTATCGTG
 1261 -----+-----+-----+-----+-----+-----+
 CACCACGGTTTTGCTATACAAGTAGGCACTCAGGGAACACCGAACGGTCGAGCGATAGCAC
V_V_P_N_D_M_F_I_R_E_S_L_V_A_C_Q_L_A_I_V

AACACTATCATCTACCCAGCTTTCCGAATGCAAAGGATGCACTACCGTAACGGTGATCCA
 1321 -----+-----+-----+-----+-----+-----+
 TTGTGATAGTAGATGGGTGAAAGCCTTACGTTTCCTACGTGATGGCATTGCCACTAGGT
N_T_I_I_Y_P_A_F_G_M_Q_R_M_H_Y_R_N_G_D_P

Figure 16A -4

```

CAGACTCCATTCCAGATCGCAGAGCAGCAGATCCAGAACTTCCAGGTGGCAAACCTGGCTC
1381 -----+-----+-----+-----+-----+-----+
GTCTGAGGTAAGGTCTAGCGTCTCGTCTAGGTCTTGAAGGTCCACCGTTTGACCGAG
Q T P F Q I A E Q Q I Q N F Q V A N W L
C
CACTTCGTGAACAACAACCAGTTCAGGCAGGCTGTGATCGATGGTGTGTTGAACCAGGTG
1441 -----+-----+-----+-----+-----+-----+
GTGAAGCACTTGTGTTGGTCAAGTCCGTCCGACACTAGCTACCAACAACCTTGGTCCAC
H F V N N N Q F R Q A V I D G V L N Q V
C
CTCAACGATAACATCCGTAACGGTCACGTGATCAACCAGCTCATGGAAGCTCTCATGCAA
1501 -----+-----+-----+-----+-----+-----+
GAGTTGCTATTGTAGGCATTGCCAGTGCAGTGTGGTCGAGTACCTTCGAGAGTACGTT
L N D N I R N G H V I N Q L M E A L M Q
C
CTCTCCAGGCAGCAGTTCCTCAACTATGCCTATCGATTACAAGCGTTCCATCCAGAGGGGA
1561 -----+-----+-----+-----+-----+-----+
GAGAGGTCCGTCGTCAAGGTTGATACGGATAGCTAATGTTGCAAGGTAGGTCTCCCTT
L S R Q Q F P T M P I D Y K R S I Q R G
C
ATCCTCCTCCTTTCCAACAGGCTTGGACAGCTCGTGGATCTCACTAGGCTCCTCGCTTAC
1621 -----+-----+-----+-----+-----+-----+
TAGGAGGAGGAAAGGTTGTCCGAACCTGTGAGCACCTAGAGTGATCCGAGGAGCGAATG
I L L L S N R L G Q L V D L T R L L A Y
C
AACTACGAGACTCTCATGGCTTGCATCACTATGAACATGCAGCACGTTCCAGACTCTCACT
1681 -----+-----+-----+-----+-----+-----+
TTGATGCTCTGAGAGTACCGAACGTAGTGATACTTGTACGTCGTGCAAGTCTGAGAGTGA
N Y E T L M A C I T M N M Q H V Q T L T
C
ACTGAGAAGCTCCAGCTCACTTCCGTGACTTCCTCTGTCATGCTCATCGGAAACGCTACT
1741 -----+-----+-----+-----+-----+-----+
TGACTCTTCGAGGTGAGTGAAGGCACTGAAGGGAGACGTACGAGTAGCCTTTGCGATGA
T E K L Q L T S V T S L C M L I G N A T
C
GTGATCCCATCCCCACAGACACTCTTCCACTACTACAACGTGAACGTGAACCTTCCACTCC
1801 -----+-----+-----+-----+-----+-----+
CACTAGGGTAGGGGTGTCTGTGAGAAGGTGATGATGTTGCACTTGCCTTGAAGGTGAGG
V I P S P Q T L F H Y Y N V N V N F H S
C
AACTACAACGAGAGGATCAACGATGCTGTGGCTATCATCACTGCTGCTAACAGGCTTAAC
1861 -----+-----+-----+-----+-----+-----+
TTGATGTTGCTCTCCTAGTTGCTACGACACCGATAGTAGTGACGACGATTGTCCGAATTG
N Y N E R I N D A V A I I T A A N R L N

```

Figure 16A -5

```

CTCTACCAAAAGAAGATGAAGGCTATCGTTGAGGATTTCTCAAGAGGCTCTACATCTTC
1921 -----+-----+-----+-----+-----+-----+
GAGATGGTTTCTTCTACTTCCGATAGCAACTCCTAAAGGAGTTCTCCGAGATGTAGAAG
L_Y_Q_K_K_M_K_A_I_V_E_D_F_L_K_R_L_Y_I_F_

GATGTGTCCAGGGTGCCAGATGATCAGATGTACCGTCTTAGGGATAGGCTTAGGCTCCTC
1981 -----+-----+-----+-----+-----+-----+
CTACACAGGTCCCACGGTCTACTAGTCTACATGGCAGAATCCCTATCCGAATCCGAGGAG
D_V_S_R_V_P_D_D_Q_M_Y_R_L_R_D_R_L_R_L_L_

CCAGTGGAGATCAGAAGGCTCGATATCTTCAACCTCATCCTTATGAACATGGATCAGATC
2041 -----+-----+-----+-----+-----+-----+
GGTCACCTCTAGTCTTCCGAGCTATAGAAGTTGGAGTAGGAATACTTGTACCTAGTCTAG
P_V_E_I_R_R_L_D_I_F_N_L_I_L_M_N_M_D_Q_I_

GAGAGGGCTTCCGATAAGATCGCTCAGGGTGTTATTATCGCTTACCGTGATATGCACCTT
2101 -----+-----+-----+-----+-----+-----+
CTCTCCCGAAGGCTATTCTAGCGAGTCCCACAATAATAGCGAATGGCACTATACGTGGAA
E_R_A_S_D_K_I_A_Q_G_V_I_I_A_Y_R_D_M_H_L_

GAGAGGGATGAGATGTACGGATACGTGAACATTGCTAGGAACCTTGAGGGATTCCAGCAG
2161 -----+-----+-----+-----+-----+-----+
CTCTCCCTACTCTACATGCCTATGCACTTGTAACGATCCTTGGAACCTCCCTAAGGTCGTC
E_R_D_E_M_Y_G_Y_V_N_I_A_R_N_L_E_G_F_Q_Q_

ATCAACCTTGAAGAGCTTATGCGTTCCGGTGATTACGCTCAGATCACTAACATGCTCCTC
2221 -----+-----+-----+-----+-----+-----+
TAGTTGGAACCTCTCGAATACGCAAGGCCACTAATGCGAGTCTAGTGATTGTACGAGGAG
I_N_L_E_E_L_M_R_S_G_D_Y_A_Q_I_T_N_M_L_L_

AACAACCAGCCAGTGGCTCTTGTGGTGCTCTCCCATTCATCACTGATTCCTCCGTGATC
2281 -----+-----+-----+-----+-----+-----+
TTGTTGGTTCGGTCACCGAGAACAACCACGAGAGGGTAAGTAGTGACTAAGGAGGCACTAG
N_N_Q_P_V_A_L_V_G_A_L_P_F_I_T_D_S_S_V_I_

TCCCTCATTGCTAAGTTGGATGCTACTGTGTTCGCTCAGATCGTGAAGCTCAGGAAAGTG
2341 -----+-----+-----+-----+-----+-----+
AGGGAGTAACGATTCAACCTACGATGACACAAGCGAGTCTAGCACTTCGAGTCCTTTTAC
S_L_I_A_K_L_D_A_T_V_F_A_Q_I_V_K_L_R_K_V_

GATACTCTCAAGCCAATCCTCTACAAGATCAACTCCGATTCCAACGATTTCTACCTCGTG
2401 -----+-----+-----+-----+-----+-----+
CTATGAGAGTTCGGTTAGGAGATGTTCTAGTTGAGGCTAAGGTTGCTAAAGATGGAGCAC
D_T_L_K_P_I_L_Y_K_I_N_S_D_S_N_D_F_Y_L_V_

```

Figure 16A -6

2461 GCTAACTACGATTGGGTGCCAACTTCCACTACAAAGGTGTACAAGCAGGTGCCACAGCAG
-----+-----+-----+-----+-----+
CGATTGATGCTAACCACGGTTGAAGGTGATGTTTCCACATGTTTCGTCCACGGTGTCGTC
A_N_Y_D_W_V_P_T_S_T_T_K_V_Y_K_Q_V_P_Q_Q

2521 TTCGATTTCGTAACCTCCATGCACATGCTCACTTCCAACCTCACTTTCCTGTGTACTCC
-----+-----+-----+-----+-----+
AAGCTAAAGGCATTGAGGTACGTGTACGAGTGAAGGTTGGAGTGAAAGTGACACATGAGG
F_D_F_R_N_S_M_H_M_L_T_S_N_L_T_F_T_V_Y_S

2581 GATCTCCTCGCTTTCGTGTCCGCTGATACTGTGGAGCCTATCAACGCTGTGGCTTTCGAT
-----+-----+-----+-----+-----+
CTAGAGGAGCGAAAGCACAGGCGACTATGACACCTCGGATAGTTGCGACACCGAAAGCTA
D_L_L_A_F_V_S_A_D_T_V_E_P_I_N_A_V_A_F_D

2641 AACATGAGGATTATGAACGAGCTTTGATGACTCGAGGGATCCTCTAGAGAA
-----+-----+-----+-----+
TTGTACTCCTAATACTTGCTCGAACTACTGAGCTCCCTAGGAGATCTCTT
N_M_R_I_M_N_E_L_*_* SEQ ID NO: 1

TTCGAGCTC SEQ ID NO: 13
-----+
AAGCTCGAG SEQ ID NO: 14

Figure 16B -1**Rotavirus VP4**

Gene name: **G9P6_VP4**

Gene length: 2388 bp

Optimized for expression in: ***Nicotiana tabacum***

```

1      GGTACCGAATTCCGACGCGTTTCGTTCCATGGCTTCCCTCATCTACCGTCAGTTGCTCACT
      -----+-----+-----+-----+-----+-----+
      CCATGGCTTAAGCCTGCGCAAGCAAGGTACCGAAGGGAGTAGATGGCAGTCAACGAGTGA
      SEQ ID NO 2 G_R_V_R_S_M_A_S_L_I_Y_R_Q_L_L_T_

61     AACTCCTACACTGTGGAGCTTTCGGATGAGATCAACACTATCGGTTCCGAGAAGTCCCAG
      -----+-----+-----+-----+-----+-----+
      TTGAGGATGTGACACCTCGAAAGGCTACTCTAGTTGTGATAGCCAAGGCTCTTCAGGGTC
      N_S_Y_T_V_E_L_S_D_E_I_N_T_I_G_S_E_K_S_Q_

121    AACGTGACTATCAACCCAGGACCATTTCGCTCAGACTAACTACGCTCCAGTGACTTGGTCA
      -----+-----+-----+-----+-----+-----+
      TTGCACTGATAGTTGGGTCCTGGTAAGCGAGTCTGATTGATGCGAGGTCACTGAACCACT
      N_V_T_I_N_P_G_P_F_A_Q_T_N_Y_A_P_V_T_W_S_

181    CACGGTGAAGTGAACGATTCCACTACTATCGAGCCAGTGCTCGATGGACCATAACCAGCCA
      -----+-----+-----+-----+-----+-----+
      GTGCCACTTCACTTGCTAAGGTGATGATAGCTCGGTCACGAGCTACCTGGTATGGTCGGT
      H_G_E_V_N_D_S_T_T_I_E_P_V_L_D_G_P_Y_Q_P_

241    ACTAACTTCAAGCCACCAAACGATTACTGGATTCTCCTCAACCCAACTAACCAGCAGGTG
      -----+-----+-----+-----+-----+-----+
      TGATTGAAGTTCGGTGGTTTGCTAATGACCTAAGAGGAGTTGGGTTGATTGGTCGTCCAC
      T_N_F_K_P_P_N_D_Y_W_I_L_L_N_P_T_N_Q_Q_V_

301    GTGCTTGAGGGAACATAACAAGACTGATATCTGGGTGGCACTCCTTCTGTGGAGCCAAAC
      -----+-----+-----+-----+-----+-----+
      CACGAACTCCCTTGATTGTTCTGACTATAGACCCACCGTGAGGAAGAACACCTCGGTTTG
      V_L_E_G_T_N_K_T_D_I_W_V_A_L_L_L_V_E_P_N_

361    GTGACTAACCAGTCCAGGCAGTACACTCTCTCGGAGAGACTAAGCAGATCACTGTGGAG
      -----+-----+-----+-----+-----+-----+
      CACTGATTGGTCAGGTCCGTCATGTGAGAGAAGCCTCTCTGATTCTAGTGACACCTC
      V_T_N_Q_S_R_Q_Y_T_L_F_G_E_T_K_Q_I_T_V_E_

```

Figure 16B -2

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AACAACACTAACAAGTGGAAGTTCTTCGAGATGTTTCAGGTCCAACGTGAACGCTGAGTTC
421 -----+-----+-----+-----+-----+-----+
TTGTTGTGATTGTTTCACCTTCAAGAAGCTCTACAAGTCCAGGTGCACTTGCGACTCAAG
N__N__T__N__K__W__K__F__F__E__M__F__R__S__N__V__N__A__E__F__

CAGCACAAAGAGGACTCTCACTTCCGATACAAAGCTCGCTGGTTTTATGAAGTTCTACAAC
481 -----+-----+-----+-----+-----+-----+
GTCGTGTTCTCCTGAGAGTGAAGGCTATGTTTCGAGCGACCAAAATACTTCAAGATGTTG
Q__H__K__R__T__L__T__S__D__T__K__L__A__G__F__M__K__F__Y__N__

TCTGTGTGGACTTTCCACGGTGAAACTCCACACGCTACTACTGATTACTCTCCACTTCC
541 -----+-----+-----+-----+-----+-----+
AGACACACCTGAAAGGTGCCACTTTGAGGTGTGCGATGATGACTAATGAGGAGGTGAAGG
S__V__W__T__F__H__G__E__T__P__H__A__T__T__D__Y__S__S__T__S__

AACCTTTCCGAGGTGGAGACTGTGATCCACGTGGAGTTCTACATCATCCCAAGGTCCCAA
601 -----+-----+-----+-----+-----+-----+
TTGGAAGGCTCCACCTCTGACACTAGGTGCACCTCAAGATGTAGTAGGGTTCCAGGGTT
N__L__S__E__V__E__T__V__I__H__V__E__F__Y__I__I__P__R__S__Q__

GAGTCTAAGTGCTCCGAGTACATCAACACTGGACTCCCACCAATGCAAAACACTAGGAAC
661 -----+-----+-----+-----+-----+-----+
CTCAGATTCACGAGGCTCATGTAGTTGTGACCTGAGGGTGGTTACGTTTGTGATCCTTG
E__S__K__C__S__E__Y__I__N__T__G__L__P__P__M__Q__N__T__R__N__

ATCGTGCCAGTGGCTTTGTCTCTCGTTCCGTGACTTACCAGAGGGCTCAGGTGAACGAG
721 -----+-----+-----+-----+-----+-----+
TAGCACGGTCCAGAAACAGGAGAGCAAGGCACTGAATGGTCTCCCGAGTCCACTTGCTC
I__V__P__V__A__L__S__S__R__S__V__T__Y__Q__R__A__Q__V__N__E__

GATATCATCATCTCCAAGACTTCCCTCTGAAAGAGATGCAGTACAACAGGGATATTATC
781 -----+-----+-----+-----+-----+-----+
CTATAGTAGTAGAGGTTCTGAAGGGAGACCTTTCTCTACGTTCATGTTGTCCCTATAATAG
D__I__I__I__S__K__T__S__L__W__K__E__M__Q__Y__N__R__D__I__I__

ATCAGGTTCAAGTTCAACAACCTCCATCGTGAAGCTCGGAGGACTCGGATACAAGTGGAGT
841 -----+-----+-----+-----+-----+-----+
TAGTCCAAGTTCAAGTTGTTGAGGTAGCACTTCGAGCCTCCTGAGCCTATGTTTCACCTCA
I__R__F__K__F__N__N__S__I__V__K__L__G__G__L__G__Y__K__W__S__

GAGATCTCCTTCAAGGCTGCTAACTACCAGTACTCTACCTCAGGGATGGTGAACAGGTG
901 -----+-----+-----+-----+-----+-----+
CTCTAGAGGAAGTTCCGACGATTGATGGTCATGAGGATGGAGTCCCTACCACTTGTCAC
E__I__S__F__K__A__A__N__Y__Q__Y__S__Y__L__R__D__G__E__Q__V__

```

Figure 16B-3

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ACAGCTCACACTACTTGCTCCGTGAACGGTGTTAAACAATTCTCCTACAACGGTGGTTCC
961 -----+-----+-----+-----+-----+-----+
TGTCGAGTGTGATGAACGAGGCACTTGCCACAATTGTTGAAGAGGATGTTGCCACCAAGG
T _ A _ H _ T _ T _ C _ S _ V _ N _ G _ V _ N _ N _ F _ S _ Y _ N _ G _ G _ S _

CTCCCAACTGATTTCTCCGTGTCCCGTTACGAGGTGATCAAAGAGAACTCCTACGTTTAC
1021 -----+-----+-----+-----+-----+-----+
GAGGGTTGACTAAAGAGGCACAGGGCAATGCTCCACTAGTTTCTCTTGAGGATGCAAATG
L _ P _ T _ D _ F _ S _ V _ S _ R _ Y _ E _ V _ I _ K _ E _ N _ S _ Y _ V _ Y _

GTGGATTACTGGGATGATTCCCAGGCTTTCAGGAACATGGTGTATGTTAGATCCCTCGCT
1081 -----+-----+-----+-----+-----+-----+
CACCTAATGACCCTACTAAGGGTCCGAAAGTCCTTGTACCACATACAATCTAGGGAGCGA
V _ D _ Y _ W _ D _ D _ S _ Q _ A _ F _ R _ N _ M _ V _ Y _ V _ R _ S _ L _ A _

GCTAACCTCAACTCCGTGAAGTGCTCCGGTGGAACTACAACCTCCAGATCCCAGTGGGA
1141 -----+-----+-----+-----+-----+-----+
CGATTGGAGTTGAGGCACCTTACGAGGCCACCTTTGATGTTGAAGGTCTAGGGTCACCTT
A _ N _ L _ N _ S _ V _ K _ C _ S _ G _ G _ N _ Y _ N _ F _ Q _ I _ P _ V _ G _

GCTTGGCCAGTGATGTCTGGTGGAGCTGTGTCTCTCCACTTCGCTGGTGTTACACTCTCC
1201 -----+-----+-----+-----+-----+-----+
CGAACCGGTCACTACAGACCACCTCGACACAGAGAGGTGAAGCGACCACAATGTGAGAGG
A _ W _ P _ V _ M _ S _ G _ G _ A _ V _ S _ L _ H _ F _ A _ G _ V _ T _ L _ S _

ACTCAGTTCAGTGATTTCTGTGTCCTCAACTCCCTCAGGTTCCAGGTTCTCCCTCACTGTG
1261 -----+-----+-----+-----+-----+-----+
TGAGTCAAGTGACTAAAGCACAGGGAGTTGAGGGAGTCCAAGTCCAAGAGGGAGTGACAC
T _ Q _ F _ T _ D _ F _ V _ S _ L _ N _ S _ L _ R _ F _ R _ F _ S _ L _ T _ V _

GAAGAGCCACCATTCTCCATCCTCAGGACTAGGGTGTCCGGACTTTACGGACTCCCAGCT
1321 -----+-----+-----+-----+-----+-----+
CTTCTCGGTGGTAAGAGGTAGGAGTCCTGATCCCACAGGCCTGAAATGCCTGAGGGTCGA
E _ E _ P _ P _ F _ S _ I _ L _ R _ T _ R _ V _ S _ G _ L _ Y _ G _ L _ P _ A _

TTCAACCCAAACAACGGACACGAGTACTACGAGATCGCTGGACGTTTCTCCCTTATCTCC
1381 -----+-----+-----+-----+-----+-----+
AAGTTGGGTTTGTGCTGTGCTCATGATGCTCTAGCGACCTGCAAAGAGGGAATAGAGG
F _ N _ P _ N _ N _ G _ H _ E _ Y _ Y _ E _ I _ A _ G _ R _ F _ S _ L _ I _ S _

CTCGTGCCATCCAACGATGATTACCAGACTCCAATTATGAACTCCGTGACTGTGAGGCAG
1441 -----+-----+-----+-----+-----+-----+
GAGCACGGTAGGTTGCTACTAATGGTCTGAGGTTAATACTTGAGGCACTGACACTCCGTC
L _ V _ P _ S _ N _ D _ D _ Y _ Q _ T _ P _ I _ M _ N _ S _ V _ T _ V _ R _ Q _

```

Figure 16B-4

1501 GATCTTGAGAGGCAGCTCGGAGATCTCAGGGAAGAGTTCAACTCCCTCTCCCAAGAGATC
 -----+-----+-----+-----+-----+-----+
 CTAGAACTCTCCGTCGAGCCTCTAGAGTCCCTTCTCAAGTTGAGGGAGAGGGTTCTCTAG
 D L E R Q L G D L R E E F N S L S Q E I

1561 GCTATGACTCAGCTCATCGATCTCGCTCTCCTCCCACTCGATATGTTCTCCATGTTCTCT
 -----+-----+-----+-----+-----+-----+
 CGATACTGAGTCGAGTAGCTAGAGCGAGAGGGTGAGCTATACAAGAGGTACAAGAGA
 A M T Q L I D L A L L P L D M F S M F S

1621 GGTATCAAGTCCACTATCGATGTGGCTAAGTCTATGGTGACTAAGGTGATGAAGAAGTTC
 -----+-----+-----+-----+-----+-----+
 CCATAGTTCAGGTGATAGCTACACCGATTGAGATACCACTGATTCCACTACTTCTTCAAG
 G I K S T I D V A K S M V T K V M K K F

1681 AAGAAGTCCGACTCGCTACTTCCATCTCCGAGCTTACTGGATCTCTCTCCAACGCTGCT
 -----+-----+-----+-----+-----+-----+
 TTCTTCAGGCCTGAGCGATGAAGGTAGAGGCTCGAATGACCTAGAGAGAGGTTGCGACGA
 K K S G L A T S I S E L T G S L S N A A

1741 TCTTCTGTGTCTAGGTCCTCCTCCATCAGGTCCAACATCTCCTCCATCTCAGTGTGGACT
 -----+-----+-----+-----+-----+-----+
 AGAAGACACAGATCCAGGAGGAGGTAGTCCAGGTTGTAGAGGAGGTAGAGTACACCTGA
 S S V S R S S S I R S N I S S I S V W T

1801 GATGTGTCCGAGCAGATCGCTGGATCTTCCGATTCCGTGCGTAACATCTCCACTCAGACT
 -----+-----+-----+-----+-----+-----+
 CTACACAGGCTCGTCTAGCGACCTAGAAGGCTAAGGCACGCATTGTAGAGGTGAGTCTGA
 D V S E Q I A G S S D S V R N I S T Q T

1861 TCCGCTATCTCCAAGAGGCTTAGGCTCAGAGAGATCACTACTCAGACTGAGGGAATGAAC
 -----+-----+-----+-----+-----+-----+
 AGGCGATAGAGGTTCTCCGAATCCGAGTCTCTCTAGTGATGAGTCTGACTCCCTTACTTG
 S A I S K R L R L R E I T T Q T E G M N

1921 TTCGATGATATCTCCGCTGCTGTGCTCAAGACTAAGATCGATAGGTCCACTCACATCTCC
 -----+-----+-----+-----+-----+-----+
 AAGCTACTATAGAGGCGACGACACGAGTTCTGATTCTAGCTATCCAGGTGAGTGTAGAGG
 F D D I S A A V L K T K I D R S T H I S

1981 CCAGATACTCTCCAGATATCATCACTGAGTCCTCCGAGAAGTTCATCCCAAGCGTGCT
 -----+-----+-----+-----+-----+-----+
 GGTCTATGAGAGGGTCTATAGTAGTGACTCAGGAGGCTCTTCAAGTAGGGTTTCGCACGA
 P D T L P D I I T E S S E K F I P K R A

Figure 16B-5

2041 TACCGTGTCTCTCAAGGATGATGAGGTGATGGAAGCTGATGTGGATGGAAAGTTCTTCGCT
 -----+-----+-----+-----+-----+-----+
 ATGGCACAAGAGTTCTTACTACTCCACTACCTTCGACTACACCTACCTTTCAAGAAGCGA
 Y_R_V_L_K_D_D_E_V_M_E_A_D_V_D_G_K_F_F_A_

2101 TACAAAGTGGGAACCTTTTCGAAGAGGTGCCATTTCGATGTGGATAAGTTCGTGGATCTCGTG
 -----+-----+-----+-----+-----+-----+
 ATGTTTCACCCCTTGAAAGCTTCTCCACGGTAAGCTACACCTATTCAAGCACCTAGAGCAC
 Y_K_V_G_T_F_E_E_V_P_F_D_V_D_K_F_V_D_L_V_

2161 ACTGATTCCCCAGTGATCTCCGCTATCATCGATTTCAAGACTCTCAAGAACCTCAACGAT
 -----+-----+-----+-----+-----+-----+
 TGACTAAGGGGTCAGTAGAGGCGATAGTAGCTAAAGTTCTGAGAGTTCTTGAGTTGCTA
 T_D_S_P_V_I_S_A_I_I_D_F_K_T_L_K_N_L_N_D_

2221 AACTACGGAATCACTAGGTCCCAGGCTCTCGATCTCATCCGTTCCGATCCAAGGGTGCTC
 -----+-----+-----+-----+-----+-----+
 TTGATGCCTTAGTGATCCAGGGTCCGAGAGCTAGAGTAGGCAAGGCTAGGTTCCCACGAG
 N_Y_G_I_T_R_S_Q_A_L_D_L_I_R_S_D_P_R_V_L_

2281 AGGGATTTTCATCAACCAGAACAACCCAATCATCAAGAACAGGATCGAGCAGCTCATTCTC
 -----+-----+-----+-----+-----+-----+
 TCCCTAAAGTAGTTGGTCTTGTGGGTTAGTAGTTCTTGTCTAGCTCGTCGAGTAAGAG
 R_D_F_I_N_Q_N_N_P_I_I_K_N_R_I_E_Q_L_I_L_

2341 CAGTGCCGTCTTTGATGACTCGAGGGATCCTCTAGAGAATTCGAGCTC SEQ ID NO: 15
 -----+-----+-----+-----+-----+
 GTCACGGCAGAACTACTGAGCTCCCTAGGAGATCTCTTAAGCTCGAG SEQ ID NO: 16
 Q_C_R_L_*_*_ SEQ ID NO: 2

Figure 16C -1
Rotavirus VP6

Gene name: **G9P6_VP6**

Gene length: 1254 bp

Optimized for expression in: ***Nicotiana tabacum***

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      GGTACCGAATTCGGACGCGTTCGTTCCATGGATGTGCTCTACTCCCTCTCCAAGACTCTC
1  -----+-----+-----+-----+-----+-----+
      CCATGGCTTAAGCCTGCGCAAGCAAGGTACCTACACGAGATGAGGGAGAGGTTCTGAGAG
          G_R_V_R_S_M_D_V_L_Y_S_L_S_K_T_L_

      AAGGATGCTAGGGATAAGATCGTGGAGGGAACCTCTCTACTCCAACGTTTCCGATCTCATC
61  -----+-----+-----+-----+-----+-----+
      TTCCTACGATCCCTATTCTAGCACCTCCCTTGAGAGATGAGGTTGCAAAGGCTAGAGTAG
      K_D_A_R_D_K_I_V_E_G_T_L_Y_S_N_V_S_D_L_I_

      CAGCAGTTCAACCAGATGATCATCACTATGAACGGAAACGAGTTCAGACTGGTGGAATC
121  -----+-----+-----+-----+-----+-----+
      GTCGTCAAGTTGGTCTACTAGTAGTGATACTTGCCCTTTGCTCAAGGTCTGACCACCTTAG
      Q_Q_F_N_Q_M_I_I_T_M_N_G_N_E_F_Q_T_G_G_I_

      GGAAACCTCCCAATCAGGAAC TGGAAC TTCGAT TTCGGACT CCTCGGAACTACTCTCCTC
181  -----+-----+-----+-----+-----+-----+
      CCTTTGGAGGGTTAGTCCTTGACCTTGAAGCTAAAGCCTGAGGAGCCTTGATGAGAGGAG
      G_N_L_P_I_R_N_W_N_F_D_F_G_L_L_G_T_T_L_L_

      AACCTCGATGCTAACTACGTGGAGACTGCTAGGAACACTATCGATTACTTTCGTTGATTTTC
241  -----+-----+-----+-----+-----+-----+
      TTGGAGCTACGATTGATGCACCTCTGACGATCCTTGTGATAGCTAATGAAGCAACTAAAG
      N_L_D_A_N_Y_V_E_T_A_R_N_T_I_D_Y_F_V_D_F_

      GTGGATAATGTGTGCATGGATGAGATGGTTCGTGAGTCCCAGAGGAACGGAATTGCTCCA
301  -----+-----+-----+-----+-----+-----+
      CACCTATTACACACGTACCTACTCTACCAAGCACTCAGGGTCTCCTTGCCCTTAACGAGGT
      V_D_N_V_C_M_D_E_M_V_R_E_S_Q_R_N_G_I_A_P_

      CAGTCCGATTCCCTCAGGAAGCTCTCCGGTATCAAGTTCAAGAGGATCAACTTCGATAAC
361  -----+-----+-----+-----+-----+-----+
      GTCAGGCTAAGGGAGTCCTTCGAGAGGCCATAGTTCAAGTTCTCCTAGTTGAAGCTATTG
      Q_S_D_S_L_R_K_L_S_G_I_K_F_K_R_I_N_F_D_N_

      TCCTCCGAGTACATCGAGAAC TGGAAC TC CAGAACAGAGGCAGAGGACTGGATTCACT
421  -----+-----+-----+-----+-----+-----+
      AGGAGGCTCATGTAGCTCTTGACCTTGAGGTCCTTGTCTCCGTCCTGACCTAAGTGA
      S_S_E_Y_I_E_N_W_N_L_Q_N_R_R_Q_R_T_G_F_T_

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Figure 16C -2

TTCCACAAGCCAAACATCTTCCCATACTCCGCTTCCTTCACTCTCAACAGGTCCCAGCCA
 481 -----+-----+-----+-----+-----+-----+
 AAGGTGTTCCGGTTTGTAGAAGGGTATGAGGCGAAGGAAGTGAGAGTTGTCCAGGGTCGGT
F_H_K_P_N_I_F_P_Y_S_A_S_F_T_L_N_R_S_Q_P

GCTCACGATAACCTCATGGGAACATATGTGGCTCAACGCTGGTTCTGAGATCCAGGTGGCA
 541 -----+-----+-----+-----+-----+-----+
 CGAGTGCTATTGGAGTACCCTTGATACACCGAGTTGCGACCAAGACTCTAGGTCCACCGT
A_H_D_N_L_M_G_T_M_W_L_N_A_G_S_E_I_Q_V_A

GGATTCGATTACTCCTGCGCTATCAACGCTCCAGCTAACACTCAGCAGTTCGAGCACATC
 601 -----+-----+-----+-----+-----+-----+
 CCTAAGCTAATGAGGACGCGATAGTTGCGAGGTCGATTGTGAGTCGTCGAAGCTCGTGTAG
G_F_D_Y_S_C_A_I_N_A_P_A_N_T_Q_Q_F_E_H_I

GTTCAGCTCAGAAGGGTGCTCACTACTGCTACTATCACTCTCCTCCCAGATGCTGAGAGG
 661 -----+-----+-----+-----+-----+-----+
 CAAGTCGAGTCTTCCCACGAGTGATGACGATGATAGTGAGAGGAGGGTCTACGACTCTCC
V_Q_L_R_R_V_L_T_T_A_T_I_T_L_L_P_D_A_E_R

TTCTCCTTCCCAAGGGTGATCAACTCCGCTGATGGTGCTACTACTTGGTACTTCAACCCA
 721 -----+-----+-----+-----+-----+-----+
 AAGAGGAAGGGTTCCTCACTAGTTGAGGCGACTACCACGATGATGAACCATGAAGTTGGGT
F_S_F_P_R_V_I_N_S_A_D_G_A_T_T_W_Y_F_N_P

GTGATCCTCAGGCCAAACAACGTGGAGGTGGAGTTCCTTCTCAACGGACAGATCATCAAC
 781 -----+-----+-----+-----+-----+-----+
 CACTAGGAGTCCGGTTTGTGTGCACCTCCACCTCAAGGAAGAGTTGCCTGTCTAGTAGTTG
V_I_L_R_P_N_N_V_E_V_E_F_L_L_N_G_Q_I_I_N

ACTTACCAGGCTCGTTTCGGAACATATCGTGGCTAGGAACCTCGATACAATCAGGCTCTCC
 841 -----+-----+-----+-----+-----+-----+
 TGAATGGTCCGAGCAAAGCCTTGATAGCACCGATCCTTGAAGCTATGTTAGTCCGAGAGG
T_Y_Q_A_R_F_G_T_I_V_A_R_N_F_D_T_I_R_L_S

TTCCAGCTTATGAGGCCACCAAACATGACTCCATCCGTGGCTGCACTCTTCCCAAACGCA
 901 -----+-----+-----+-----+-----+-----+
 AAGGTCAATACTCCGGTGGTTTGTACTGAGGTAGGCACCGACGTGAGAAGGGTTTTCGT
F_Q_L_M_R_P_P_N_M_T_P_S_V_A_A_L_F_P_N_A

CAGCCATTCGAGCACCACGCTACTGTGGGACTCACTCTCAAGATCGAGTCCGCTGTGTGC
 961 -----+-----+-----+-----+-----+-----+
 GTCGGTAAGCTCGTGGTGCGATGACACCTGAGTGAGAGTTCTAGCTCAGGCGACACACG
Q_P_F_E_H_H_A_T_V_G_L_T_L_K_I_E_S_A_V_C

Figure 16C -3

1021 GAGTCTGTGCTCGCTGATGCTTCCGAGACTATGCTCGCTAACGTGACTTCTGTGAGGCAA
 -----+-----+-----+-----+-----+-----+
 CTCAGACACGAGCGACTACGAAGGCTCTGATACGAGCGATTGCACTGAAGACACTCCGTT
E _ S _ V _ L _ A _ D _ A _ S _ E _ T _ M _ L _ A _ N _ V _ T _ S _ V _ R _ Q _

1081 GAGTACGCTATCCCAGTGGGACCAGTGTTTCCACCAGGAATGAACTGGACTGATCTCATC
 -----+-----+-----+-----+-----+-----+
 CTCATGCGATAGGGTCACCCTGGTCACAAAGGTGGTCCTTACTTGACCTGACTAGAGTAG
E _ Y _ A _ I _ P _ V _ G _ P _ V _ F _ P _ P _ G _ M _ N _ W _ T _ D _ L _ I _

1141 ACTAACTACTCCCCATCCAGAGAGGATAACCTCCAGAGGGTGTTCACTGTGGCTTCCATC
 -----+-----+-----+-----+-----+-----+
 TGATTGATGAGGGGTAGGTCTCTCCTATTGGAGGTCTCCACAAGTGACACCGAAGGTAG
T _ N _ Y _ S _ P _ S _ R _ E _ D _ N _ L _ Q _ R _ V _ F _ T _ V _ A _ S _ I _

1201 CGTTCCATGCTCGTGAAGTGATGACTCGAGGGATCCTCTAGAGAA
 -----+-----+-----+-----+-----+
 GCAAGGTACGAGCACTTCACTACTGAGCTCCCTAGGAGATCTCTT
R _ S _ M _ L _ V _ K _ * _ * _ SEQ ID NO: 3

TTGAGCTC SEQ ID NO: 17

----+----

AAGCTCGAG SEQ ID NO: 18

Figure 16D -1
Rotavirus VP 7

Gene name: **G9P6_VP7**

Gene length: 1041 bp

Optimized for expression in:

Nicotiana tabacum

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1      GGTACCGAATTCGGACGCGTTCGTTGCATGTACGGAATCGAGTACACTACTATCCTCACT
-----+-----+-----+-----+-----+-----+
      CCATGGCTTAAGCCTGCGCAAGCAACGTACATGCCTTAGCTCATGTGATGATAGGAGTGA
SEQ ID NO:4 G_R_V_R_C_M_Y_G_I_E_Y_T_T_I_L_T_

61     TTCCTCATCTCCATCGTGCCTCCTCAACTACATCCTCAAGTCCCTCACTTCCGCTATGGAT
-----+-----+-----+-----+-----+-----+
      AAGGAGTAGAGGTAGCACGAGGAGTTGATGTAGGAGTTCAGGGAGTGAAGGCGATACCTA
F_L_I_S_I_V_L_L_N_Y_I_L_K_S_L_T_S_A_M_D_

121    TTCATCATCTACCGTTTCCTCCTCCTCATCGTGATCGCTTCCCCATTTCGTTAAGACTCAG
-----+-----+-----+-----+-----+-----+
      AAGTAGTAGATGGCAAAGGAGGAGGAGTAGCACTAGCGAAGGGGTAAGCAATTCTGAGTC
F_I_I_Y_R_F_L_L_L_I_V_I_A_S_P_F_V_K_T_Q_

181    AACTACGGTATCAACCTCCCAATCACTGGATCTATGGATACTGCTTACGCTAACTCCTCC
-----+-----+-----+-----+-----+-----+
      TTGATGCCATAGTTGGAGGGTTAGTGACCTAGATACCTATGACGAATGCGATTGAGGAGG
N_Y_G_I_N_L_P_I_T_G_S_M_D_T_A_Y_A_N_S_S_

241    CAGCAAGAGACTTTCCTCACTTCCACACTCTGCCTCTACTACCCAACTGAGGCATCCACA
-----+-----+-----+-----+-----+-----+
      GTCGTTCTCTGAAAGGAGTGAAGGTGTGAGACGGAGATGATGGGTTGACTCCGTAGGTGT
Q_Q_E_T_F_L_T_S_T_L_C_L_Y_Y_P_T_E_A_S_T_

301    CAGATCGGAGATACAGAGTGGAAGGATACTCTCTCCCAGCTCTTCCTCACTAAGGGATGG
-----+-----+-----+-----+-----+-----+
      GTCTAGCCTCTATGTCTCACCTTCCTATGAGAGAGGGTCGAGAAGGAGTGATTCCCTACC
Q_I_G_D_T_E_W_K_D_T_L_S_Q_L_F_L_T_K_G_W_

361    CCAACTGGTTCCGTGTACTTCAAAGAGTACACTGATATCGCTTCCTTCTCCATCGATCCA
-----+-----+-----+-----+-----+-----+
      GGTTGACCAAGGCACATGAAGTTTCTCATGTGACTATAGCGAAGGAAGAGGTAGCTAGGT
P_T_G_S_V_Y_F_K_E_Y_T_D_I_A_S_F_S_I_D_P_

```

Figure 16D -2

CAGCTCTACTGCGATTACAACGTGGTGCTTATGAAGTACGATTCCACTCTTGAGCTTGAT
 421 -----+-----+-----+-----+-----+-----+
 GTCGAGATGACGCTAATGTTGCACCACGAATACTTCATGCTAAGGTGAGAACTCGAACTA
Q L Y C D Y N V V L M K Y D S T L E L D

 ATGTCCGAGCTTGCTGATCTCATCCTCAACGAGTGGCTCTGCAACCCAATGGATATCACT
 481 -----+-----+-----+-----+-----+-----+
 TACAGGCTCGAACGACTAGAGTAGGAGTTGCTCACCAGACGTTGGGTTACCTATAGTGA
M S E L A D L I L N E W L C N P M D I T

 CTCTACTACTACCAGCAGACTGATGAGGCTAACAAGTGGATCTCTATGGGACAGTCCTGC
 541 -----+-----+-----+-----+-----+-----+
 GAGATGATGATGGTCGTCTGACTACTCCGATTGTTACCTAGAGATACCCTGTCAGGACG
L Y Y Y Q Q T D E A N K W I S M G Q S C

 ACTATCAAAGTGTGCCCCTCAACACTCAGACTCTCGGAATCGGATGCATCACTACTAAC
 601 -----+-----+-----+-----+-----+-----+
 TGATAGTTTCACACGGGTGAGTTGTGAGTCTGAGAGCCTTAGCCTACGTAGTGATGATTG
T I K V C P L N T Q T L G I G C I T T N

 ACTGCTACTTTTCGAGGAAGTGGCTACTTCCGAGAAGCTCGTGATCACTGATGTGGTGGAT
 661 -----+-----+-----+-----+-----+-----+
 TGACGATGAAAGCTCCTTCACCGATGAAGGCTCTTCGAGCACTAGTGACTACACCACCTA
T A T F E E V A T S E K L V I T D V V D

 GGTGTTAACCACAAGCTCGATGTGACTACTAACACATGCACAATCAGGAAGTGAAGAAG
 721 -----+-----+-----+-----+-----+-----+
 CCACAATTGGTGTTCGAGCTACACTGATGATTGTGTACGTGTTAGTCCTTGACGTTCTTC
G V N H K L D V T T N T C T I R N C K K

 CTCGGACCAAGGGAACGTGGCTATCATCCAAGTGGGAGGTTCCGATGTGCTCGATATC
 781 -----+-----+-----+-----+-----+-----+
 GAGCCTGGTTCCCTTTTGCACCGATAGTAGGTTACCCCTCCAAGGCTACACGAGCTATAG
L G P R E N V A I I Q V G G S D V L D I

 ACTGCTGATCCAACACTACTGCTCCACAGACTGAGAGGATGATGAGGGTGAAGTGAAGAAG
 841 -----+-----+-----+-----+-----+-----+
 TGACGACTAGGTTGATGACGAGGTGTCTGACTCTCCTACTACTCCCACTTGACCTTCTTC
T A D P T T A P Q T E R M M R V N W K K

 TGGTGGCAGGTTTTCTACACTGTGGTGGATTACATCAACCAGATCGTTCAGGTGATGTCC
 901 -----+-----+-----+-----+-----+-----+
 ACCACCGTCCAAAAGATGTGACACCACCTAATGTAGTTGGTCTAGCAAGTCCACTACAGG
W W Q V F Y T V V D Y I N Q I V Q V M S

Figure 16D -3

```
AAGAGGTCCCGTTCTCTCAACTCCGCTGCTTTTCTACTACCGTGTGTGATGACTCGAGGGA
961 -----+-----+-----+-----+-----+-----+
TTCTCCAGGGCAAGAGAGTTGAGGCGACGAAAGATGATGGCACACACTACTGAGCTCCCT
K_R_S_R_S_L_N_S_A_A_F_Y_Y_R_V_*_*_ SEQ ID NO: 4

TCCTCTAGAGAATTCGAGCTC SEQ ID NO: 19
1021 -----+-----+-----+
AGGAGATCTCTTAAGCTCGAG SEQ ID NO: 20
```

Figure 17

A-2X35S/CPMV-HT/ RVA(WA) VP2(opt)/ NOS (Construct number 1710)

Figure 17A, SEQ ID NO: 21

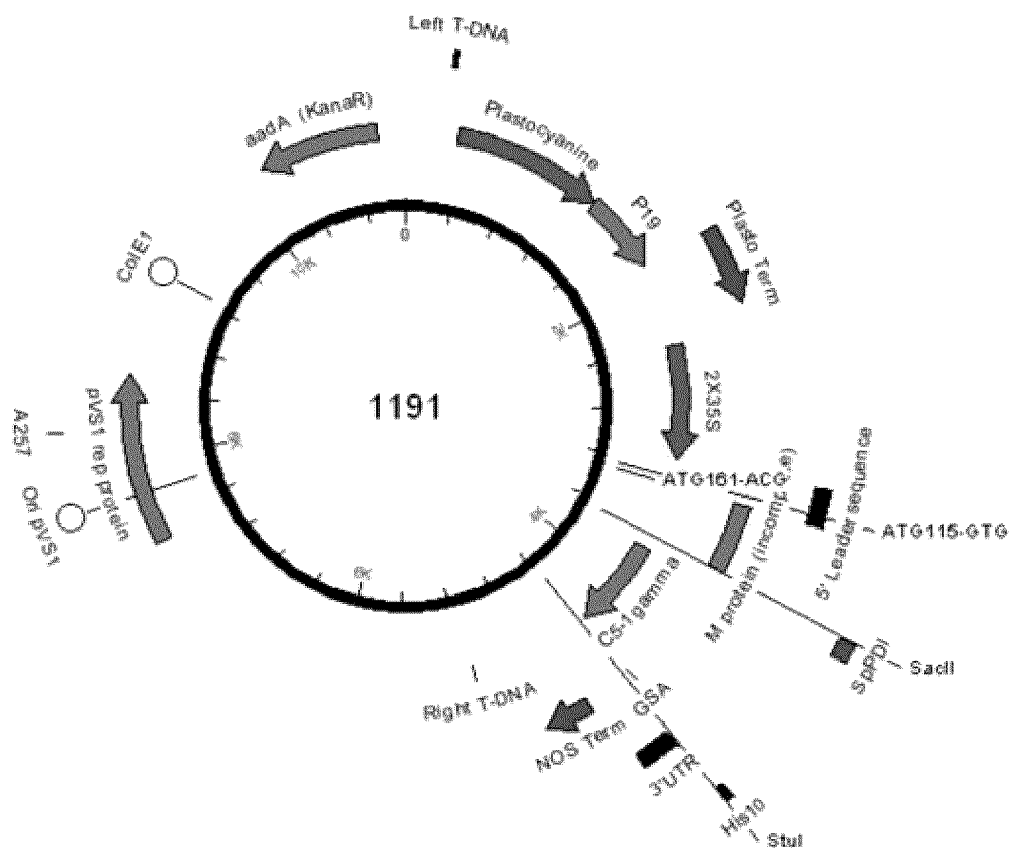
IF-WA_VP2(opt).s1+3c

AAATTTGTCGGGCCCATGGCATAACCGGAAGAGAGGAGCAAAGCGCGAA

Figure 17B, SEQ ID NO: 22

IF-WA_VP2(opt).s1-4r

ACTAAAGAAAATAGGCCTTTAAAGCTCGTTCATTATTCGCATATTGTCGA

Figure 17C

Construct 1191 from left to right t-DNA borders (underlined). 2X35S/CPMV-HT/NOS with Plastocyanine-P19-Plastocyanine silencing inhibitor expression cassette

34/73

CACACAGCTCAGACGCAACCCCGGGAGGAGCAGTTCAACAGCACTTTCCGCTCAGTCAGTGAAC TTC
CCATCATGCACCAGGACTGGCTCAATGGCAAGGAGCGATCGCTCACCATCACCATCACCATCACCAT
CACCATTAAAGGCCTATTTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGA
GCGGTTTTCTGTGCTCAGAGTGTGTTTATTTATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCAG
GTCGTCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTATTAATAAAAAAAAAAAAAAAAAAGACCGG
GAATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCAATAAAGTTTCTTAAGATTG
AATCCTGTTGCCGGTCTTGCGATGATTATCATATAATTTCTGTTGAATTACGTTAAGCATGTAATAAT
TAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTATGATTAGAGTCCCGCAATTATACATTT
AATACGCGATAGAAAAACAAATATAGCGCGCAAACTAGGATAAATTATCGCGCGCGGTGTCATCTAT
GTTACTAGATCTCTAGAGTCTCAAGCTTGGCGCGCCACGTGACTAGTGGCACTGGCCGTCGTTTTAC
AACGTCGTGACTGGGAAAACCTGGCGTTACCCAACTTAATCGCCTTGCAGCACATCCCCCTTTCGCC
AGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCG
AATGCTAGAGCAGCTTGAGCTTGATCAGATTGTCGTTTCCCGCCTTCAGTTTAACTATCAGTGTTT
GACAGGATATATTGGCGGGTAAACCTAAGAGAAAAGAGCGTTTA

Figure 19 nucleotide sequence encoding VP2(opt) from Rotavirus A WA strain (SEQ ID NO: 45).

ATGGCATACCGGAAGAGAGGAGCAAAGCGCGAAAACCTGCCGCAACAGAACGAGAGA
CTGCAAGAAAAAGAGATAGAGAAAGATGTCGACGTAACAATGGAAAACAAGAATAAC
AATAGGAAACAACAGCTGTCCGACAAAGTTCTGTCCCAGAAGGAGGAAATTATCACT
GACGCCCAGGACGATATTTAAATTTGCCGGAGAAATAAAGAAGAGCTCGAAAGAAGAA
TCTAAACAGCTGCTCGAAATTCTGAAAACAAAAGAAGACCATCAGAAAGAGATTCAA
TATGAAATTTTGCAAAAAACAATACCTACATTTGAGTCCAAAGAAAGTATCCTCAAG
AAGCTTGAAGACATAAGACCGGAGCAGGCAAAAAACAGATGAAACTCTTTCGCATT
TTCGAGCCAAAACAGCTCCCTATATATCGCGCCAATGGCGAGAAGGAGCTACGCAAC
CGGTGGTACTGGAAGTTGAAAAAGACACCTTGCCAGATGGAGATTATGACGTCCGG
GAGTATTTCTCAATCTCTATGATCAGATCCTCATCGAAATGCCGGACTATCTGCTC
CTCAAGGACATGGCCGTGGAGAACAATAAGCAGAGACGCCGGCAAAGTTGTGAC
TCTGAGACTGCCAATATTTGTGATGCCATCTTCCAGGATGAGGAGACCGAGGGAGTC
GTCCGTAGATTTCATCGCTGATATGCGGCAACAGGTCCAGGCTGATCGTAACATTGTC
AATTACCTTCCATCCTTCACCTATTGATCATGCATTCAATGAGTATTTTCTTAAC
CACCAGTTGGTGGAGCCGCTGAACAATGAGATAATCTTCAATTACATACCAGAGAGG
ATAAGGAATGACGTGAATTACATCCTGAACATGGATATGAATCTGCCATCTACAGCC
AGGTATATCAGGCCAACTTGTTGCAGGATAGACTGAATCTTCACGATAATTTTGAG
TCCCTGTGGGATACCATCACAACATCCAACCTACATTCTGGCCAGGTCCGTCGTTCCC
GATTTGAAGGAGAAGGAGCTGGTCTCCACCGAAGCACAGATCCAGAAAATGAGCCAG
GACCTGCAGCTGGAGGCCCTCACTATTCAGAGCGAGACACAGTTTTTAGCCGGGATT
AACAGTCAGGCTGCCAATGATTGTTTCAAGACCCTCATAGCCGCCATGCTGTCTCAA
AGAACCATGTCTTTGGACTTTGTGACCACGAACCTATATGAGCCTAATCTCCGGAATG
TGGCTACTTACAGTGATTCCCAACGATATGTTCTCCGGGAGTCACTAGTGGCCTGT
GAGCTGGCGATCATCAACACCATCGTGTATCCAGCATTTCGGAATGCAGAGAATGCAT
TACCGGAATGGCGACCCTCAGACACCCTTCCAGATCGCAGAACAGCAGATCCAGAAT
TTCCAGGTGGCGAACTGGCTCCATTTTATTAACAATAACAGATTCAGGCAAGTTGTG
ATTGATGGAGTTCTGAATCAGACTCTGAACGACAATATACGGAATGGACAGGTCATC
AACCAGCTGATGGAAGCATTGATGCAACTCAGCAGACAGCAGTTCCCCACGATGCCT
GTGGATTACAAACGGAGCATCCAACGGGGCATTTCTGCTTCTCTCCAATAGGCTGGGG
CAGCTTGTGACTTAACCCGACTGGTCTCCTATAACTACGAGACGCTAATGGCTTGT
GTGACCATGAACATGCAGCACGTGCAAACCCTGACAACTGAGAAGTTGCAGCTCACT
TCTGTGACTTCGCTTTGTATGTTAATTGGTAACACAACCGTGATTCCGTCCCCACAG
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AAAATGAAGTCCATAGTGGAAGACTTTCTGAAACGGCTCCAGATTTTCGACGTACCA
CGAGTGCTGACGACCAAATGTACAGGCTGAGGGATCGCCTTCGGCTCTTACCCGTT
GAACGGAGACGGCTTGACATATTCAACTTGATCCTGATGAATATGGAGCAGATCGAA
CGCGCTTCTGATAAGATTGCTCAGGGGGTTATCATCGCATAACGAGATATGCAGCTG
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GACTTTTACCTTGTGGCCAACCTACGACTGGATCCCCACAAGTACAACCTAAGGTCTAC
AAACAGGTGCCACAACCATTCGACTTTAGAGCCAGCATGCACATGCTGACTTCTAAC
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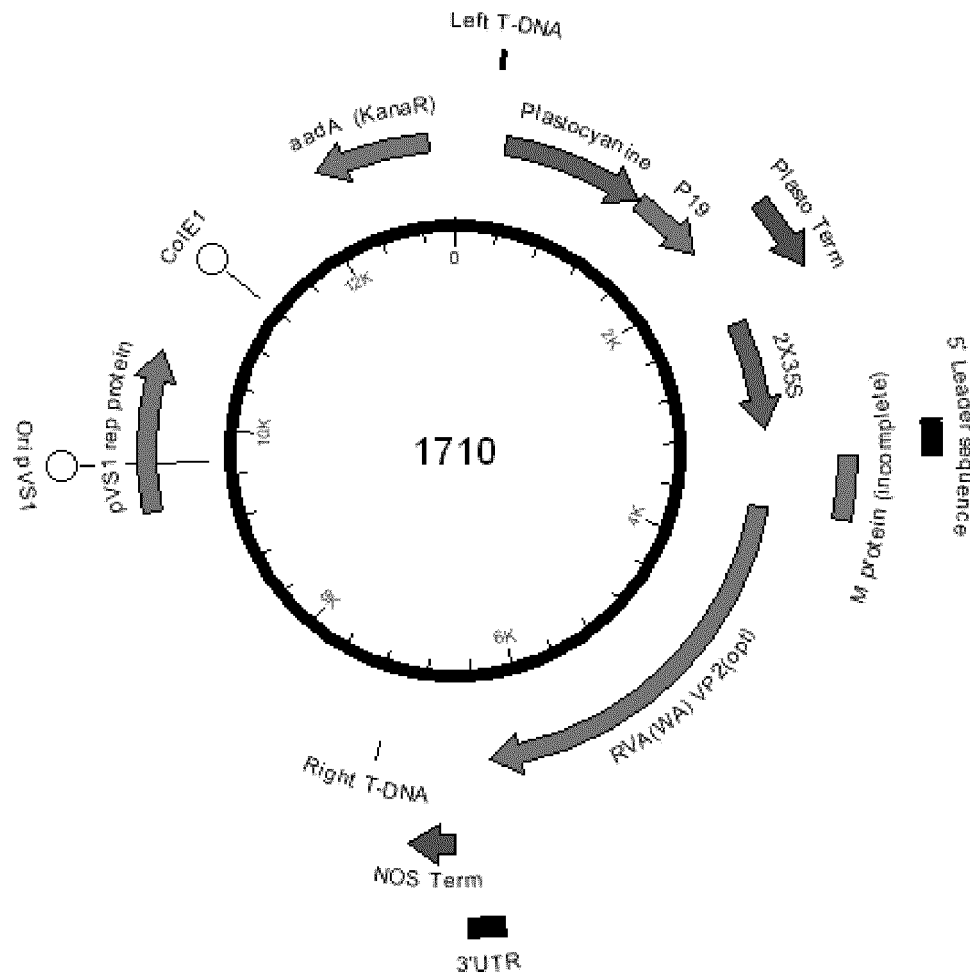
Figure 20, SEQ ID NO: 25

Amino acid sequence of VP2 from Rotavirus A WA strain

MAYRKRGA KRENLPQQNERLQEKEIEKDVDVTMENKNNNRKQQLSDKVLSQKEEITDAQDDIKIAGEIK
KSSKEESKQ LLEILKTKEDHQKEIQYEILQKTIPTFESKESILKKLEDIRPEQAKKQMKLFRIFEPKQLPIYRA
NGEKELRNRWYWKLLKDTLPDGDYDVREYFLNLYDQILIEMPDYLLLKDMAVENKNSRDAGKVVDSE
TANICDAIFQDEETEGVRRFIADMRQQVQADRNVNYP SILHPIDHAFNEYFLNHQLVEPLNNEIIFNYIPE
RIRNDVNYILNMDMNL PSTARYIRPNLLQDRLNLHDNFESLWD TITTSNYILARSVVPDLKEKELVSTEAQ
IQKMSQDLQLEALTIQSETQFLAGINSQAANDCFKTLIAAMLSQRTMSLDFVTTNYMSLISGMWLLTVIPN
DMFLRESLVACELAIINTIVYPAFGMQRMHYRNGDPQTPFQIAEQQIQNFQVANWLHFINNNRFRQVVID
GVLNQTLNDNIRNGQVINQLMEALMQLSRQQFPTMPVDYKRSIQRGILL SNRLGQLVDLTRLVSYNYET
LMACVTMNMQHVQTLTTEKLQLTSVTSCLMIGNTTVIPSPQTLFHYYNINVN FHSNYNERINDAVAIITA
ANRLNLYQKKMKSIVEDFLKRLQIFDVPRVPDDQMYRLRDRRLRLLPVERRRLDIFNLILMNMEQIERASD
KIAQGVIHAYRDMQLERDEMYGYVNIARNLDGYQQINLEELMRTGDYGGITNMLLNNQPVALVGALPFV
TDSSVISLIAKLDATVFAQIVKLRKVDTLKPILYKINSDSNDFYLVANYDWIPTSTTKVYKQVPQPFDFRAS
MHMLTSNLTFTVYSDDL SFVSADTVEPINAVAFDNMRIMNEL

Figure 21

Schematic representation of construct number 1710



B-2X35S/CPMV-HT/RVA(WA) VP2(opt)/NOS into BeYDV(m)+Replicase
amplification system (Construct number 1711)

Figure 22A

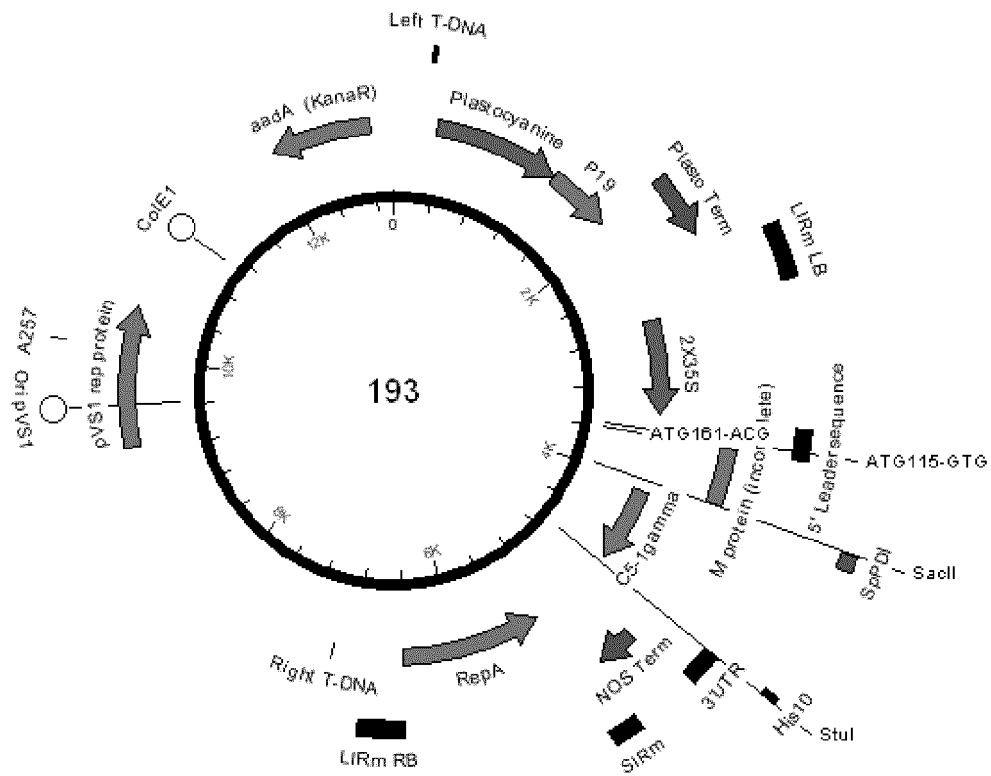


Figure 22B, SEQ ID NO: 26

Construct 193 from left to right t-DNA borders (underlined). 2X35S/CPMV-HT/NOS into BeYDV(m)+Replicase amplification system with Plastocyanine-P19-Plastocyanine silencing inhibitor expression cassette

TGGCAGGATATATTGTGGTGTAAACAAATTGACGCTTAGACAACCTTAATAACACATTGCGGACGTTT
TAAATGTACTGAATTAACGCCGAATCCCGGGCTGGTATATTTATATGTTGTCAAATAACTCAAAAACC
ATAAAAGTTTAAAGTTAGCAAGTGTGTACATTTTACTTGAACAAAAATATTCACCTACTACTGTTATA
AATCATTATTAACATTAGAGTAAAGAAATATGGATGATAAGAACAAGAGTAGTGATATTTTGACAA
CAATTTTGTGCAACATTTGAGAAAAATTTGTTGTCTCTCTTTTCATTGGTCAAAAACAATAGAGAG
AGAAAAAGGAAGAGGGGAGAATAAAAAACATAATGTGAGTATGAGAGAGAAAGTTGTACAAAAGTTG
TACCAAAATAGTTGTACAAATATCATTGAGGAATTTGACAAAAGCTACACAAATAAGGGTTAATTGC
TGTAAATAAATAAGGATGACGCATTAGAGAGATGTACCATTAGAGAATTTTGGCAAGTCATTAAAA
AGAAAGAATAAATTATTTTAAATTAAGTTGAGTCATTTGATTAAACATGTGATTATTTAATGAA
TTGATGAAAGAGTTGGATTAAAGTTGTATTAGTAATTAGAATTTGGTGTCAAATTTAAGTTGACATTT
GATCTTTTCTATATATTGCCCATAGAGTCAGTTAACTCATTTTATATTTTCATAGATCAAATAAGA
GAAATAACGGTATATTAATCCCTCCAAAAAAGAAACGGTATATTTACTAAAAAATCTAAGCCACG
TAGGAGGATAACAGGATCCCGTAGGAGGATAACATCCAATCCAACCAATCACAACAATCCTGATG
AGATAACCCACTTTAAGCCACGCATCTGTGGCACATCTACATTATCTAAATCACACATTCTCCACA
CATCTGAGCCACACAAAAACCAATCCACATCTTTACCCATTCTATAAAAAATCACACTTTGTGAG
TCTACACTTTGATTCCCTTCAAACACATACAAAGAGAAGAGACTAATTAATTAATTAATCATCTTGAG
AGAAAATGGAACGAGCTATACAAGGAAACGACGCTAGGGAACAAGCTAACAGTGAACGTTGGGATG
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GCTACATAACGATGAGACGAATTCGAATCAAGATAATCCCTTGGTTTCAAGGAAAGCTGGGGTTTC
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GATCTTGGACGGGAGATTCCGTTAACTATGCAGCATCTCGATTTTCGGTTTCGACCAGATCGGATGT
ACCTATAGTATTCGGTTTCGAGGAGTTAGTATCACCGTTTCTGGAGGGTCGCGAACTCTTCAGCATCT
CTGTGAGATGGCAATTCGGTCTAAGCAAGAACTGCTACAGCTTGCCCAATCGAAGTGGAAGTAAT
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CTTCGCTCTCTATTTATAATATGGTTTGTATTGTTAATTTTGTCTTGTAGAAGAGCTTAATTAATCG
TTGTTGTTATGAAATACTATTTGTATGAGATGAACTGGTGTAAATGTAATTCATTTACATAAGTGGA
CAGAATCAGAATGTTTCTCCATAACTAAGTACATGAAGACCTGCCGCGTACAATTGCTTATATT
TGAACAATAAAATTGAACATCTTTTGCCACAACCTTTATAAGTGGTTAATATAGCTCAAATATATGGT
CAAGTTCAATAGATTAATAATGGAATATCAGTTATCGAAATTCATTAACAATCAACTTAACGTTATT
AACTACTAATTTTATATCATCCCTTTGATAAATGATAGTACACCAATTAGGAAGGAGCATGCTCGCC
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CTCTCCCCGCGCGTTGGGAATTACTAGCGCGTGTGAGACGCGTTGTTGTTGTGACTCCGAGGGGTTG
CCTCAAACCTCTATCTTATAACCGGCGTGGAGGCATGGAGGCAGGGGTATTTTGGTCAATTTAATAGAT
AGTGGAATAATGACGTGGAATTTACTTAAAGACGAAGTCTTTGCGACAAGGGGGGGCCACGCCGAA
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TCTATATAAGGAAGTTTCATTTGAGAGGTATTAATACTTAATAGGTTTTGATAAAAGCGAAC
GTGGGGAAACCCGAACCAAACTTCTTCTAACTCTCTCTCATCTCTTAAAGCAAACCTTCTCTCT
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TGCTGCCCAAACTCAATGGTGACCTGGGATGCCTGGTCAAGGGCTATTTCCTGAGCCAGTG
ACAGTGACCTGGAACCTTGATCCCTGTCCAGCGGTGTGCACACCTTCCAGCTGTCTGCAGTCTGA

CCTCTACACTCTGAGCAGCTCAGTGACTGTCCCCTCCAGCACCTGGCCCAGCGAGACCGTCACTGC
AACGTTGCCACCCGGCCAGCAGCACCAAGGTGGACAAGAAAATTGTGCCAGGGATTGTGGTTGTA
AGCCTTGATATGTACAGTCCCAGAAAGTATCATCTGTCTTCATCTTCCCCCAAAGCCCAAGGATGTG
CTCACCATTACTCTGACTCCTAAGGTCACGTGTGTTGTGGTAGACATCAGCAAGGATGATCCCCGAGG
TCCAGTTCAGCTGGTTGTAGATGATGTGGAGGTGCACACAGCTCAGACGCAACCCCGGGAGGAGCA
GTTCAACAGCACTTCCGCTCAGTCAGTGAACCTCCCATCATGCACCAGGACTGGCTCAATGGCAAG
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CGTGCGTCAGATTTGCGAGGAGAGACCTTATGATCTCGGAAATCTCCTCTGGTTTTAATATCTCCGTC
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TACCGGCGTGGCCCCCTTATCGCGAGTGCTTTAGCACGAGCGGTCCAGATTTAAAGTAGAAAAATT
TCCCGCCCACTAGGGTTAAAGGTGTTCACTATAAAAGCATATACGATGTGATGGTATTTGACTAG
TGGCACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACCTGGCGTTACCCAACCTAATCGCCTT
GCAGCACATCCCCCTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCAGTCGCCCTTCCCAAC
AGTTGCGCAGCCTGAATGGCGAATGCTAGAGCAGCTTGAGCTTGGATCAGATTGTGCTTTCCCGCCTT
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Figure 23, SEQ ID NO: 27

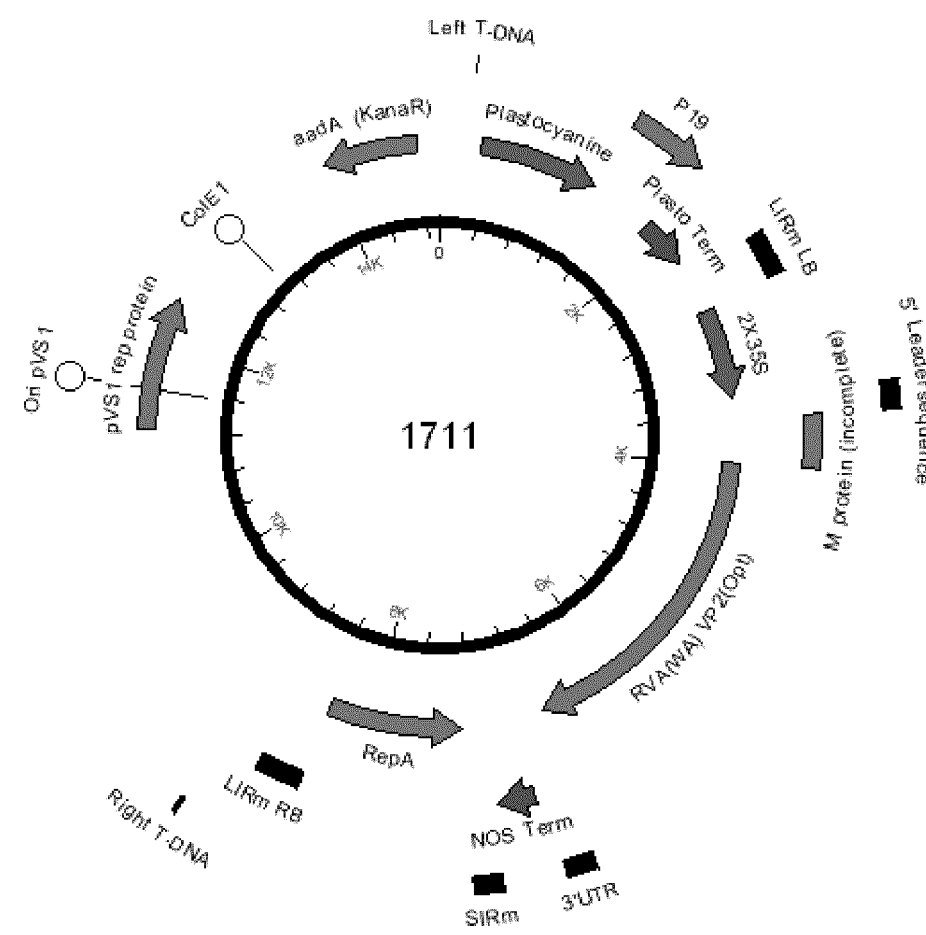
Expression cassette number 1710 from 2X35S promoter to NOS terminator. VP2(opt) from Rotavirus A WA strain is underlined.

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 TATCTGTCACTTTATTGTGAAGATAGTGGAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGAT
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 AGGAGCATCGTGGAAAAAGAACGCTTCCAACCACGCTTCAAAGCAAGTGGATTGATGTGATAAC
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 GCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAACCTCCTCGGATTCCATTGCCCAGCTATCTG
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 CATTTGGAGAGGTATTAATCTTAATAGGTTTGTATAAAGCGAACGTGGGGAAACCCGAACCAAA
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GCTCCCTATATATCGCGCCAATGGCGAGAAAGGAGCTACGCAACCGGTGGTACTGGAAGTTGAAAAA
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AACCTTACGTTTACCGTCTACTCTGACCTACTGTTCATTTGTTTCAGCGGACACGGTAGAGCCATTAA
CGCAGTCGATTTCGACAATATGCGAATAATGAACGAGCTTTAAAGGCCTATTTTCTTTAGTTTGAATT
TACTGTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTAT

GTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATTTT
AATTTTATTAAAAAAGACCGGGAATTCGATATCAAGCTTATCGACCTGCAGATC
GTTCAAACATTTGGCAATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATTATCATA
TAATTTCTGTTGAATTACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATG
GGTTTTTATGATTAGAGTCCCGCAATTATACATTTAATACGCGATAGAAAAAAAATATAGCGCGCA
AACTAGGATAAATTATCGCGCGCGGTGTCATCTATGTTACTAGAT

Figure 24

Schematic representation of construct number 1711



C-2X35S/CPMV-HT/RVA(WA) VP6(opt)/NOS (Construct number 1713)**Figure 25a**, SEQ ID NO: 28

IF-WA_VP6(opt).s1+3c

AAATTTGTCGGGCCCATGGAGGTCCTTTATAGTCTCTCCAAAACGCTGA

Figure 25b, SEQ ID NO: 29

IF-WA_VP6(opt).s1-4r

ACTAAAGAAAATAGGCCTCTACTTGATCAACATACTCCGGATAGAGGCCA
CA**Figure 25c**, SEQ ID NO: 30

Expression cassette number 1713 from 2X35S promoter to NOS terminator. VP6(opt) from Rotavirus A WA strain is underlined.

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACC
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 TATCTGTCACTTTATTGTGAAGATAGTGGAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGAT
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 AGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAAC
 ATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGG
 GCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCAGCTATCTG
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 AAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGC
 ATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTG
 ACGTAAGGGATGACGCACAATCCCACTATCCTTCGCAAGACCCCTTCCTCTATATAAGGAAGTTCATTT
 CATTGGAGAGGTATTAATCTTAATAGGTTTGTATAAAGCGAACGTGGGGAAACCCGAACCAAA
 CCTTCTTCTAACTCTCTCATCTCTCTTAAAGCAAACCTTCTCTTGTCTTTCTTGCCTGAGCGATCT
 TCAACGTTGTGAGATCGTCTCGGCACCACTACAACGTTTCTTTCACTGAAGCGAAATCAAAGATC
 TCTTTGTGGACACGTAGTGCAGCGCCATTAAATAACGTGTACTTGTCTTCTTGTCTGCTGCTGCT
 TGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTACGCCCCATACATTACTTGTACGATTCTGCTGACT
 TTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTTGCTGTACTTCTTCTTCTTCTTCT
 TTGCTGATTGGTTCTATAAGAAATCTAGTATTTCTTTGAAACAGAGTTTCCCGTGGTTTTCGAACCT
 GGAGAAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTGCGGGCCCATGGAGGTCCTTTATAGT
CTCTCCAAAACGCTGAAGGACGCTAGGGACAAGATCGTGGAGGGTACACTTTATAGCAATGTCAGCG
ACCTAATACAGCAGTTTAAATCAAATGATCGTTACAATGAATGGGAATGATTTCCAACTGGCGGTAT
TGGTAATCTGCCCGTGAGGAACTGGACATTCGATTTCCGGCCTGCTGGGCACGACTCTCCTTAATCTCG
ATGCAAAATTATGTAGAAAACGCCAGAACGATTATCGAGTACTTTATCGATTTCATTGATAACGTTTGT
ATGGATGAGATGGCCCGCGAGTCACAACGGAACGGAGTTGCTCCACAGTCCGAGGCCCTTCGGAAA
CTCGCCGGCATTAAGTTCAAGCGTATTAATTTGACAACCTCTCCGAATATATAGAGAACTGGAACCT
GCAGAATCGTCGACAGAGAACCGGCTTCGTGTCCATAAACCTAATATCTTTCCGTATAGCGCCTCAT
TCACCCTGAATAGGAGTCAGCCCCATGCACGACAACCTCATGGGTACAATGTGGCTGAATGCGGGGAG
TGAAATACAGGTCGCCGGGTTGATTACTCCTGTGCCATTAATGCACCCGCAAAACATCCAGCAGTTC
GAACATATCGTGCAACTAAGACGGGCTCTCACGACCGCGACAATTACACTCCTGCCGACGCCGAGC
GCTTCTCCTTTCCCGCGTAATCAACTCAGCTGATGGCGCCACCACTTGGTTCTTCAACCCTGTTATAT
TGCGCCCTAACAACGTAGAGGTGGAGTTTCTCTTAAACGGACAGATCATCAATACCTACCAAGCCAG
GTTCCGGCACGATTATTGCAAGAAATTTGACGCTATCAGGCTGCTCTTCCAACCTGATGAGGCCCCCCA
ATATGACTCCCGCTGTGAACGCTTTGTTTCCGCAGGCTCAGCCTTTCCAGCACACGCCACCGTCGGC
TTGACTCTTGAATAGAGAGCGCGGTCTGCGAATCAGTGTGCGACAGCCAAACGAGACGCTGCTGG
CAAACGTTACCGCCGTGCGGCAAGAGTATGCCATCCCAGTAGGGCCTGTGTTTCCACCCGGCATGAA
CTGGACTGAACTAATTACTAATATAGCCCATCCAGAGAAGACAACCTTGCAGCGGGTCTTCACTGTG
GCCTCTATCCGGAGTATGTTGATCAAGTAGAGGCCTATTTCTTTAGTTTGAATTTACTGTTATTCCGT
GTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTATTTATGTAATTTAATTTCT
 TTGTGAGCTCCTGTTTAGCAGGTGCTCCCTTCAGCAAGGACACAAAAAGATTTAATTTTATTAATAA
 AAAAAAAAAAAAAAGACCGGAATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTGGC
 AATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCATGATTATCATATAATTTCTGTTGAATT
 ACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTATGATTAGA
 GTCCCGCAATTATACATTTAATACGCGATAGAAAAACAAATATAGCGCGCAAACTAGGATAAATTAT
 CGCGCGCGGTGTATCTATGTTACTAGAT

Figure 25d

Nucleotide sequence encoding VP6(opt) from Rotavirus A WA strain (SEQ ID NO: 46)

ATGGAGGTCCTTTATAGTCTCTCCAAAACGCTGAAGGACGCTAGGGACAAGATCGTG
GAGGGTACACTTTTATAGCAATGTCAGCGACCTAATACAGCAGTTTAATCAAATGATC
GTTACAATGAATGGGAATGATTTCCAAACTGGCGGTATTGGTAATCTGCCCCGTGAGG
AACTGGACATTCGATTTTCGGCCTGCTGGGCACGACTCTCCTTAATCTCGATGCAAAT
TATGTAGAAAACGCCAGAACGATTATCGAGTACTTTATCGATTTTCATTGATAACGTT
TGTATGGATGAGATGGCCCGCGAGTCACAACGGAACGGAGTTGCTCCACAGTCCGAG
GCCCTTCGGAAACTCGCCGGCATTAAGTTCAAGCGTATTAATTTTCGACAACCTCCTCC
GAATATATAGAGAACTGGAACCTGCAGAATCGTCGACAGAGAACC GGCTTCGTGTTT
CATAAACCTAATATCTTTCCGTATAGCGCCTCATTACCCCTGAATAGGAGTCAGCCC
ATGCACGACAACCTCATGGGTACAATGTGGCTGAATGCGGGGAGTGAAATACAGGTC
GCCGGGTTTCGATTACTCCTGTGCCATTAATGCACCCGCAAACATCCAGCAGTTCGAA
CATATCGTGCAACTAAGACGGGCTCTCACGACCGCGACAATTACACTCCTGCCCGAC
GCCGAGCGCTTCTCCTTTCCCCGCGTAATCAACTCAGCTGATGGCGCCACCACTTGG
TTCTTCAACCCTGTTATATTGCGCCCTAACAAACGTAGAGGTGGAGTTTCTCTTAAAC
GGACAGATCATCAATACCTACCAAGCCAGGTTTCGGCACGATTATTGCAAGAAATTTT
GACGCTATCAGGCTGCTCTTCCAACTGATGAGGCCCCCAATATGACTCCCGCTGTG
AACGCTTTGTTTCCGCAGGCTCAGCCTTTCCAGCACACGCCACCGTCGGCTTGACT
CTTCGAATAGAGAGCGCGGTCTGCGAATCAGTGCTGGCAGACGCCAACGAGACGCTG
CTGGCAAACGTTACCGCCGTGCGGCAAGAGTATGCCATCCCAGTAGGGCCTGTGTTT
CCACCCGGCATGAACTGGACTGAACTAATTACTAACTATAGCCCATCCAGAGAAGAC
AACTTGCAGCGGGTCTTCACTGTGGCCTCTATCCGGAGTATGTTGATCAAGTAG

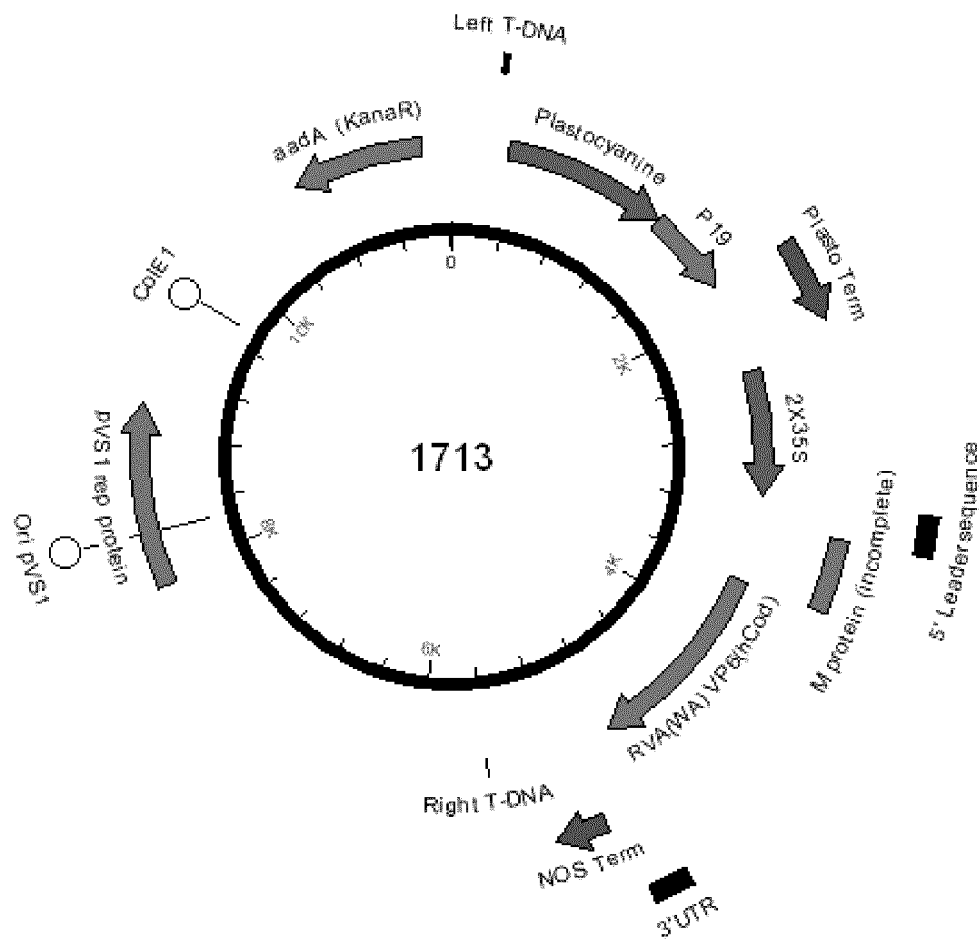
Figure 26, SEQ ID NO: 31

Amino acid sequence of VP6 from Rotavirus A WA strain

MEVLYSLSKTLKDARDKIVEGTLYSNVSDLIQQFNQMIVTMNGNDFQTGGIGNLPVRNWTDFEGLLGTTL
LNLDANYVENARTHEYFIDFIDNVCMDEMARESQRNGVAPQSEALRKLKAGIKFKRINF DNSSEYIENWNL
QNRRTQTGFVFHKPNIFPYSASF TLNRSQPMHDNLMGMTMWLNAGSEIQVAGFDYSCAINAPANIQQFEHI
VQLRRALTATITLLPDAERFSFPRVINSADGATTWFFNPVILRPNNVEVEFLNGQIINTYQARFGTHIARN
FDAIRLLFQLMRPPNMTPAVNALFPQAQPFQHHATVGLTLRIESAVCESVLADANETLLANVTAVRQEYA
IPVGPVFPPGMNWTTELITNYSRDNLQRVFTVASIRSMLIK

Figure 27

Schematic representation of construct number 1713



D-2X35S/CPMV-HT/RVA(WA) VP6(opt)/NOS into BeYDV(m)+Replicase
amplification system (Construct number 1714)

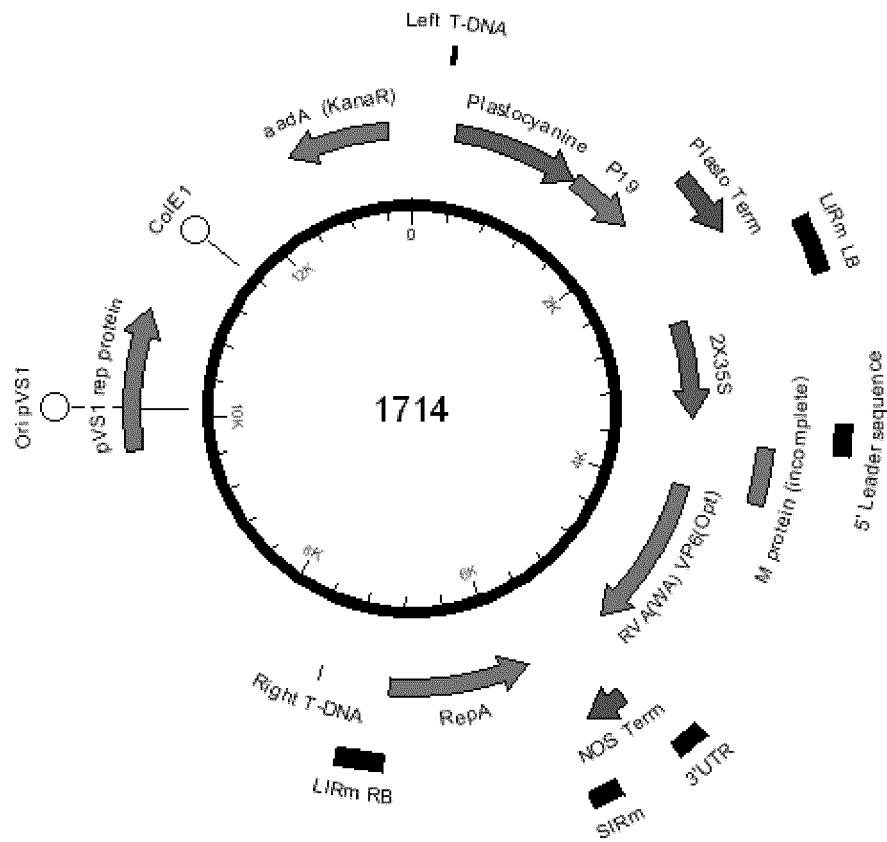
Figure 28, SEQ ID NO: 32

Expression cassette number 1714 from 2X35S promoter to NOS terminator. VP6(opt) from Rotavirus A WA strain is underlined.

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACC
AAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCAGC
TATCTGTCACTTTATTGTGAAGATAGTGGAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGAT
AAAGGAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCAAAGATGGACCCCCACCCACG
AGGAGCATCGTGGAAAAAGAACGTTCCAACCACGCTTCAAAGCAAGTGGATTGATGTGATAAC
ATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGG
GCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCAGCTATCTG
TCACCTTATTGTGAAGATAGTGGAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGA
AAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCAAAGATGGACCCCCACCCACGAGGAGC
ATCGTGGAAAAAGAACGTTCCAACCACGCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTG
ACGTAAGGGATGACGCACAATCCCACTATCCTTCGCAAGACCCCTTCTCTATATAAGGAAGTTCAATTT
CATTTGGAGAGGTATTAATAATCTTAATAGGTTTGTATAAAGCGAACGTGGGGAAACCCGAACCAAA
CCTTCTCTAAACTCTCTCTCATCTCTTAAAGCAAACCTTCTCTTGTCTTCTTGTGCGTGAGCGATCT
TCAACGTTGTCAGATCGTGCTTCGGCACCAGTACAACGTTTTCTTCACTGAAGCGAAATCAAAGATC
TCTTTGTGGACACGTAGTGGCGGCCATTAAATAACGTGTACTGTCTATTCTTGTGCGGTGTGGTCT
TGGGAAAAAGAAAGCTTGTGGAGGCTGCTGTTACGCCCCATACATTACTTGTACGATTCTGCTGACT
TTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTGTTGCCTGTACTTCTTCTCTCTTC
TTGCTGATTGGTTCTATAAGAAATCTAGTATTTCTTTGAAACAGAGTTTCCCGTGGTTTTCGAACTT
GGGAAAGATTGTTAAGCTTCTGTATATTCTGCCAAATTTGTCGGGCCCCATGGAGGTCCTTTATAGT
CTCTCCAAAACGCTGAAGGACGCTAGGGACAAGATCGTGGAGGGTACACTTTATAGCAATGTCAGCG
ACCTAATACAGCAGTTTAAATCAAATGATCGTTACAATGAATGGGAATGATTTCCAAACTGCGCGTAT
TGGTAATCTGCCCCTGAGGAACTGGACATTCGATTTCCGGCCTGCTGGGCACGACTCTCCTTAATCTCG
ATGCAAAATTATGTAGAAAACGCCAGAACGATTATCGAGTACTTTATCGATTTCATTGATAACGTTTGT
ATGGATGAGATGGCCCGGAGTCACAACGGAACGGAGTTGCTCCACAGTCCGAGGCCCTTCGGAAA
CTCGCCGGCATTAAAGTTCAAGCGTATTAATTTGACAACCTCCTCCGAATATATAGAGAACTGGAACCT
GCAGAATCGTCCGACAGAGAACC GGCTTCGTGTTCCATAAAACCTAATATCTTCCGTATAGCGCCTCAT
TCACCCTGAATAGGAGTCAGCCCATGCACGACAACCTCATGGGTACAATGTGGCTGAATGCGGGGAG
TGAAATACAGGTCGCCGGGTTCTGATTACTCCTGTGCCATTAATGCACCCGCAAACATCCAGCAGTTC
GAACATATCGTGCAACTAAGACGGGCTCTCAGCACC GCGACAATTACACTCCTGCCCGACGCCGAGC
GCTTCTCCTTTCCCCGCGTAATCAACTCAGCTGATGGCGCCACC ACTTGGTTCTTCAACCCTGTTATAT
TGCGCCCTAACACGTAGAGGTGGAGTTTCTTTAAACGGACAGATCATCAATACCTACCAAGCCAG
GTTCCGGCACGATTATTGCAAGAAATTTTCGACGCTATCAGGCTGCTCTTCCAACCTGATGAGGCCCCCA
ATATGACTCCCCTGTGAACGCTTTGTTTCCGAGGCTCAGCCTTTCCAGCACCACGCCACCGTCGGC
TTGACTCTTCGAATAGAGAGCGCGGTCTGCGAATCAGTGCTGGCAGACGCCAACGAGACGCTGCTGG
CAACGTTACCGCCGTGCGGCAAGAGTATGCCATCCAGTAGGGCCTGTGTTTCCACCCGGCATGAA
CTGGACTGAACTAATTACTAATAAGCCCATCCAGAGAAGACAACCTTGACGCGGGTCTTCACTGTG
GCCTCTATCCGGAGTATGTTGATCAAGTAGAGGCCTATTTCTTTAGTTTGAATTTACTGTTATTCGGT
GTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTATGTAATTTAATTTCT
TTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATTTAATTTTATTAATAA
AAAAAAAAAAAAAGACCGGAATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGC
AATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGGCATGATTATCATATAATTTCTGTTGAAT
ACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTATGATTAGA
GTCCCGCAATTATACATTTAATACGCGATAGAAAAACAAATATAGCGCGCAAACCTAGGATAAATTAT
CGCGCGCGGTGTCATCTATGTTACTAGAT

Figure 29

Schematic representation of construct number 1714



E-2X35S/CPMV-HT/ RVA(Rtx) VP4(opt)/ NOS (Construct number 1731)

Figure 30A, SEQ ID NO: 33

IF-Rtx_VP4(opt).sl+3c

AAATTTGTCGGGCCCATGGCTAGCCTGATCTACAGACAACTCTTGACCAAT
TC

Figure 30B, SEQ ID NO: 34

IF-Rtx_VP4(opt).sl-4r

ACTAAAGAAAATAGGCCTTCAGAGTTTACATTGCAGGATTAATTGCTCAA
TCCTA

Figure 31A, SEQ ID NO: 35

Expression cassette number 1731 from 2X35S promoter to NOS terminator. VP4(opt) from Rotavirus A Rotarix strain is underlined.

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACC
AAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGC
TATCTGTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGAT
AAAGGAAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGC
AGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAAC
ATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAAGG
GCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTG
TCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGA
AAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGC
ATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTG
ACGTAAGGGATGACGCACAATCCCACTATCCTTCGCAAGACCCCTTCTCTATATAAGGAAGTTCATTT
CATTTGGAGAGGTATTAATACTTAATAGGTTTGTATAAAGCGAACGTGGGGAAACCCGAACCAAAA
CCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAGCAAACTTCTCTTGTCTTTCTTGGCGTGAAGCATCT
TCAACGTTGTGATCGTGTCTCGGCACCAAGTACAACGTTTCTTTCACTGAAGCGAAATCAAAGATC
TCTTTGTGGACACGTAGTGGCGGCCATTAAATAACGTGTACTTGTCTTCTTGTCTGCTGCTGCTGCT
TGGGAAAAGAAAGCTTGTGAGGCTGCTGTTACGCCCCATACATTACTTGTACGATTCTGCTGACT
TTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATGTTGCCTGTACTTCTTCTCTCTCTC
TTGCTGATTGGTTCTATAAGAAATCTAGTATTTCTTTGAAACAGAGTTTCCCGTGGTTTTCGAACCTT
GGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTGCGGGCCCATGGCTAGCCTGATCTAC
AGACAACTCTTGACCAATTCATATTCTGTGGATCTTCATGACGAAATCGAGCAGATTGGGTCCGAGA
AGACCCAGAACGTGACCATCAACCCTGGACCTTTTGCTCAGACCCGCTATGCCCTGTGAATTGGGA
TCACGGAGAAATCAACGACAGTACGACCGTCAACCCATTCTGGACGGGCCATACCAACCCACCACC
TTACCCACCTAATGATTATTGGATTTTAATCAACTCCAACACAAACGGAGTGGTCTACGAGTCCAC
TAATAACTCCGATTTTGGACCGCCGTTGTAGCCATCGAGCCACACGTCAATCCTGTGATCGCCAGT
ATATGATATTTCGGCGAGTCCAAACAGTTTAACGTTTCCAATGACAGCAACAAATGGAAGTTTCTGGA
GATGTTTTCGAGCTCCTCTCAGAACGAATTCTATAATAGACGGACCCCTACCTCCGATACACGACTCG
TGGGTATTTTAAGTACGGCGGCAGGGTGTGGACATTTACGGTGAAACCCCTCGAGCAACCACTGA
CTCCAGTAGCACTGCAAACCTGAACAATATATCTATTACCATCCACAGCGAATTCTACATAATCCCA
AGATCTCAGGAAAGTAAGTGTAACGAATATATCAACAACGGACTCCCCCAATTGAGAATACACGG
AACGTGGTGCCTCTCCCACTCAGTTCTCGGTCTATCCAGTATAAAGAGAGCACAAAGTGAATGAGGACA
TTATTGTGAGCAAGACTAGCCTTTGGAAAGAAATGCAGTACAACAGAGACATTATCATCCGGTTTAA
GTTTGGGAACTCTATCGTGAAGATGGGCGGCCCTGGGGTACAAATGGTCAGAAATCTCATATAAAGCC
GCCAACTATCAGTATAACTACTTGAGAGACGGCGAGCAGGTAAACCGCCACACAACATGCTCTGTCA
ACGGCGTTAATAACTTTAGTACAACGGAGGCTTCCTTCCACCGACTTCGGTATCAGCCGGTATGA
AGTCATCAAGGAAAATTCTTATGTGTACGTAGATTACTGGGATGATAGCAAAGCGTTCCGCAACATG
GTGTATGTTAGGAGCCTGGCTGCTAATCTCAATTCTGTGAAGTGTACTGGTGGATCATATTATTCTC
AATTCCCGTGGGGCTTGCCAGTCATGAATGGCGGGGAGTCTCCCTCCATTTTGTGGCGTGACGT
TGAGCACTCAGTTTACCGATTTCTGTGTCTCTGAACTCCCTGAGGTTCCGGTTTTCCCTTACTGTGACG
AGCCCCATTGACATTCTGCGTACAAGAACTGTCAACCTCTACGGGTTACCTGCCGGAATCCAAA
CAACGGCAATGAATACTATGAAATTTCCGGCCGCTTCTCTTTGATAAGTCTGGTACCAACTAGAC
GACTATCAGACACCCATCATGAACAGCGTGACTGTAGACAGGACCTGGAAAGACAACTATACAGAT
CTGCGGGAAGAATTCAATTCTCTCAGTCAGGAGATTGCAATGGCCCAATTGATAGATCTTGCCCTACT
GCCTCTCGATATGTTTAGTATGTTCTCCGGCATCAAACTATAGATCTGACAAAGAGCATGGCTA
CTTCTGTGATGAAGAAGTTCAGGAAATCAAAACTTGCCACGAGCATATCAGAAATGACGAACTCTCT
GAGTGATGCAGCATCATCAGCGTCACGCAACGTTTCATTCCGTCGAATCTCAGCGCCATCAGCAAC
TGGACAAACGTTGTCACACGACGTGACGCAACGTTGACCAACTCCTTGAACGATATTTTACCCAGACGT
CAACGATCAGTAAGAAACTCCGCTTGAAAGAAATGATCACCAGACTGAGGGAATGTCTTTCGACGA

CATTTCCGCCGCCGTGCTAAAAACAAAATCGATATGTCTACTCAGATCGGCAAGAACACTCTGCCG
GATATCGTAACCGAAGCCTCCGAAAAGTTTATCCCTAAGCGCAGCTACAGAATATTGAAAGATGACG
AGGTCATGGAGATCAACACAGAAGGGAAGTTCTTCGCTTATAAGATCAACACCTTTGACGAGGTTCC
GTTTGACGTCAATAAGTTTGCAGAGCTCGTGACAGATAGTCCAGTGATTTCTGCCATCATTGACTTTA
AGACTTTGAAGAACCTGAACGACAACCTATGGAATAACACGACCGAAGCGTTGAACCTCATTAAGTC
CAATCCCAATATGTTGCGCAATTTTCAATTAACCAGAACAAATCCAATCATAAGAAATAGGATTGAGCAA
TTAATCCTGCAATGTAAACTCTGAAGGCCTATTTTCTTTAGTTTGAATTTACTGTTATTCCGGTGTGCAT
TTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTTATGTAATTTAATTTCTTTGTGA
GCTCCTGTTTAGCAGGTCTGCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTATTAATAAAAAA
AAAAAAAAGACCGGGAATTTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCAATAA
AGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCAGTATTATCATATAATTTCTGTTGAATTACGTT
AAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTATGATTAGAGTCCC
GCAATTATACATTTAATACGCGATAGAAAACAAAATATAGCGCGCAAACTAGGATAAATTATCGCGC
GCGGTGTCATCTATGTTACTAGAT

Figure 31B

Optimized coding sequence of Rotavirus A VP4 from strain RVA/Vaccine/USA/Rotarix-A41CB052A/1988/G1P1A[8] (SEQ ID NO: 47)

ATGGCTAGCCTGATCTACAGACAACCTCTTGACCAATTCATATTCTGTGGATCTTCATGACGAAATCGA
 GCAGATTGGGTCCGAGAAGACCCAGAACGTGACCATCAACCCCTGGACCTTTTGCTCAGACCCGCTAT
 GCCCCTGTGAATTGGGATCACGGAGAAATCAACGACAGTACGACCGTCAACCCATTCTGGACGGGC
 CATACCAACCCACCACCTTCAACCCACCTAATGATTATTGGATTTTAATCAACTCCAACACAAACGGA
 GTGGTCTACGAGTCCACTAATAACTCCGATTTTGGACCGCGGTTGTAGCCATCGAGCCACACGTCAA
 TCCTGTGATCGCCAGTATATGATATTCCGGCGAGTCCAAACAGTTTAACGTTTCCAATGACAGCAAC
 AAATGGAAGTTTCTGGAGATGTTTCGAGCTCCTCTCAGAACGAATTCATAATAGACGGACCCCTTA
 CCTCCGATACACGACTCGTGGGTATTTTAAGTACGGCGGCAGGGTGTGGACATTTACGGTGAAC
 CCCTCGAGCAACCACTGACTCCAGTAGCACTGCAAAACCTGAACAATATATCTATTACCATCCACAGC
 GAATTCATACATAATCCCAAGATCTCAGGAAAAGTAAGTGAACGAATATATCAACAACGGACTCCCC
 CAATTCAGAATACACGGAACGTGGTGCCTCTCCCACTCAGTTCTCGGTCTATCCAGTATAAGAGAGC
 ACAAGTGAATGAGGACATTATTGTGAGCAAGACTAGCCTTTGGAAGAAATGCAGTACAACAGAGA
 CATTATCATCCGGTTTAAAGTTTGGGAACCTCTATCGTGAAGATGGGCGGCCTGGGGTACAAATGGTCA
 GAAATCTCATATAAAGCCGCAACTATCAGTATAACTACTTGAGAGACGGCGAGCAGGTAACCGCCC
 ACACAACATGCTCTGTCAACGGCGTTAATAACTTTAGCTACAACGGAGGCTTCCTTCCCACCGACTTC
 GGTATCAGCCGGTATGAAGTCATCAAGGAAAATTCTTATGTGTACGTAGATTACTGGGATGATAGCA
 AAGCGTTCGCAACATGGTGTATGTTAGGAGCCTGGCTGCTAATCTCAATTCTGTGAAGTGTACTGGT
 GGATCATATTATTTCTCAATTCCCGTGGGGGCTTGGCCAGTCATGAATGGCGGGGCAGTCTCCCTCCA
 TTTTGTGGCGTGACGTTGAGCACTCAGTTTACCGATTTCGTGTCTCTGAACTCCCTGAGGTTCCGGTT
 TTCCCTTACTGTGACGAGCCCCCATTACGCAATTCTGCGTACAAGAACTGTCAACCTCTACGGGTTAC
 CTGCCGCAATCCAAACAACGGCAATGAATACTATGAAATTTCCGGCCGCTTCTCTTTGATAAGTCT
 GGTACCAACTAATGACGACTATCAGACACCCATCATGAACAGCGTGACTGTCAGACAGGACCTGGA
 AAGACAACCTTACAGATCTGCGGGAAGAATTCAATTCTCTCAGTCAGGAGATTGCAATGGCCCAATTG
 ATAGATCTTGCCCTACTGCCTCTCGATATGTTTAGTATGTTCTCCGGCATCAAATCAACTATAGATCT
 GACAAAGAGCATGGCTACTTCTGTGATGAAGAAGTTCAGGAAATCAAACTTGCCACGAGCATATCA
 GAAATGACGAACTCTCTGAGTGATGCAGCATCATCAGCGTCACGCAACGTTTCCATTCCGGTCAATC
 TCAGCGCCATCAGCAACTGGACAAACGTGTCCAACGACGTGACGCAACGTGACCAACTCCTTGAACGA
 TATTTCTACCCAGACGTCAACGATCAGTAAGAAACTCCGCTTGAAAGAAATGATACCCAGACTGAG
 GGAATGTCTTTGACGACATTTCCGCCGCCGTGCTAAAAACAAAATCGATATGTCTACTCAGATCG
 GCAAGAACACTCTGCCGATATCGTAACCGAAGCCTCCGAAAAGTTTATCCCTAAGCGCAGCTACAG
 AATATTGAAAGATGACGAGGTGATGAGATCAACACAGAAGGGAAGTTCTTCGCTTATAAGATCAA
 CACCTTTGACGAGGTTCCGTTTACGTCATAAAGTTTGCAGAGCTCGTGACAGATAGTCCAGTGATTT
 CTGCCATCATTGACTTTAAGACTTTGAAGAACCTGAACGACAACCTATGGAATAACACGACCGAAGC
 GTTGAACCTCATTAAGTCCAATCCCAATATGTTGCGCAATTTCAATTAACCAGAACAAATCCAATCATAA
 GAAATAGGATTGAGCAATTAATCCTGCAATGTAAACTCTGA

Figure 31C (SEQ ID NO: 44)

Expression cassette number 1730 from 2X35S promoter to NOS terminator. VP4(opt) from Rotavirus A Rotarix strain is underlined.

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACC
 AAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGC
 TATCTGTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGAT
 AAAGGAAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACG
 AGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAAC
 ATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGG
 GCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTG
 TCATTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGA
 AAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGC
 ATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTG
 ACGTAAGGGATGACGCACAATCCCACTATCCTTCGCAAGACCCCTTCCTCTATATAAGGAAGTTCATTT
 CATTGGAGAGGTATTAATCTTAATAGGTTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAA
 CCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAGCAAACCTTCTCTTGTCTTTCTTGGCGTGAAGCATCT
 TCAACGTTGTGACAGTCTGCTTCGGCACCAGTACAACGTTTTCTTTCACTGAAGCGAAATCAAAGATC
 TCTTTGTGGACACGTAGTGGCGGCCATTAAATAACGTGTACTTGTCTTCTTGTCTGCGTGTGGTCT
 TGGGAAAAGAAAGCTTGTGAGGCTGCTGTTACGCCCCATACATTACTTGTACGATTCTGCTGACT
 TTCGGCGGGTGCAATATCTTACTTCTGCTTGACGAGGTATGTTGCCTGTACTTCTTCTTCTTCTTCT
 TTGCTGATTGGTTCTATAAGAAATCTAGTATTTCTTTGAAACAGAGTTTTCCCGTGGTTTTCGAACTT
 GGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTGCGGCCCATGGCTAGCCTGATCTAC
 AGACAACTCTTGACCAATTCATATTCTGTGGATCTTCATGACGAAATCGAGCAGATTGGGTCCGAGA
 AGACCCAGAACGTGACCATCAACCCTGGACCTTTTGCTCAGACCCGCTATGCCCTGTGAATTGGGA
 TCACGGAGAAATCAACGACAGTACGACCGTGAACCCATTCTGGACGGGCCATACCAACCCACCACC
 TTACCCCCACCTAATGATTATTGGATTTTAATCAACTCCAACACAAACGGAGTGGTCTACGAGTCCAC
 TAATAACTCCGATTTTGGACCGCGCTTGTAGCCATCGAGCCACACGTCAATCTGTGCTGATCGCCAGT
 ATATGATATTCGGCGAGTCCAAACAGTTTAACGTTTCCAATGACAGCAACAAATGGAAGTTTCTGGA
 GATGTTTTCGAGCTCCTCTCAGAACGAATTCTATAATAGACGGACCCCTACCTCCGATACACGACTCG
 TGGGTATTTTAAAGTACGGCGGCAGGGTGTGGACATTTACGGGTGAAACCCCTCGAGCAACCACTGA
 CTCCAGTAGCACTGCAAACCTGAACAATATATCTATTACCATCCACAGCGAATTCTACATAATCCCA
 AGATCTCAGGAAGTAAGTGAACGAATATATCAACAACGGACTCCCCCAATTGAGAATACACGG
 AACGTGGTGCCTCTCCCACTCAGTTCTCGGTCTATCCAGTATAAGAGAGCACAAGTGAATGAGGACA
 TTATTGTGAGCAAGACTAGCCTTTGGAAGAAATGCAGTACAACAGAGACATTATCATCCGGTTTAA
 GTTTGGGAACCTCTATCGTGAAGATGGGCGGCCTGGGGTACAAATGGTCAGAAATCTCATATAAAGCC
 GCCAACTATCAGTATAACTACTTGAGAGACGGCGAGCAGGTAAACCGCCACACAACATGCTCTGTCA
 ACGGCGTTAATAACTTTAGCTACAACGGAGGCTTCCTTCCACCGACTTCGGTATCAGCCGGTATGA
 AGTCATCAAGGAAATTTCTTATGTGTACGTAGATTACTGGGATGATAGCAAAGCGTTCGCAACATG
 GTGTATGTTAGGAGCCTGGCTGCTAATCTCAATTCTGTGAAGTGTACTGGTGGATCATATTATTTCTC
 AATTCCCGTGGGGGCTTGGCCAGTCATGAATGGCGGGGCGAGTCTCCCTCCATTTTGTGCGGTGACGT
 TGAGCACTCAGTTTACCGATTTCGTGTCTCTGAACTCCCTGAGGTTCCGGTTTTCCCTTACTGTGACG
 AGCCCCATTGACATTCTGCGTACAAGAACTGTCAACCTCTACGGGTTACCTGCCGCAATCCAA
 CAACGGCAATGAATACTATGAAATTTGGGCGCGTCTCTCTTTGATAAGTCTGGTACCAACTAATGAC
 GACTATCAGACACCCATCATGAACAGCGTGACTGTGACAGACAGGACCTGGAAAGACAACCTTACAGAT
 CTGCGGGAAGAATTCAATTCTCTCAGTCAGGAGATTGCAATGGCCCAATTGATAGATCTTGCCCTACT
 GCCTCTCGATATGTTTAGTATGTTCTCCGGCATCAAACTAATAGATCTGACAAAGAGCATGGCTA
 CTTCTGTGATGAAGAAGTTCAGGAAATCAAAACTTGCCACGAGCATATCAGAAATGACGAACTCTCT
 GAGTGATGCAGCATCATCAGCGTCACGCAACGTTTCCATTCCGGTCAATCTCAGCGCCATCAGCAAC
 TGGACAAACGTGTCCAACGACGTGACCAACGTGACCAACTCCTTGAACGATATTTCTACCCAGACGT
 CAACGATCAGTAAGAACTCCGCTTGAAGAAATGATCACCAGACTGAGGGAATGTCTTTTCGACGA
 CATTTCGCCCGCCGTGCTAAAAACCAAAATCGATATGTCTACTCAGATCGGCAAGAACACTCTGCCG
 GATATCGTAACCGAAGCCTCCGAAAAGTTTATCCCTAAGCGCAGCTACAGAATATTGAAAGATGACG
 AGGTGATGGAGATCAACACAGAAGGGAAGTTCTTCGCTTATAAGATCAACACCTTTGACGAGGTTCC
 GTTTGACGTCAATAAGTTTGCAGAGCTCGTACAGATAGTCCAGTGATTCTGCCATCATTGACTTTA
 AGACTTTGAAGAACCTGAACGACAACCTATGGAATAACACGGACCGAAGCGTTGAACCTCATTAAGTC
 CAATCCCAATATGTTGCGCAATTTCAATTAACCAGAACAAATCCAATCATAAGAAATAGGATTGAGCAA
 TTAATCCTGCAATGTAACCTCTGAAGGCCTATTTCTTTAGTTTGAATTTACTGTTATTCCGGTGTGCAT
 TTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTATTTTATGTAATTTAATTTCTTTGTGA
 GCTCCTGTTTAGCAGGTGCTCCCTTCAGCAAGGACACAAAAAGATTTAATTTTATTAATAAAAAA
 AAAAAAAGACCGGAATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCAATAA
 AGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCATGATTATCATATAATTTCTGTTGAATTACGTT
 AAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTATGATTAGAGTCCC
 GCAATTATACATTTAATACGCGATAGAAAACAAAATATAGCGCGCAAACTAGGATAAATTATCGCGC
 GCGGTGTCATCTATGTTACTAGAT

Figure 32, SEQ ID NO: 36

Amino acid sequence of VP4 from Rotavirus A Rotarix strain

MASLIYRQLLTNSYSVDLHDEIEQIGSEKTQNVNTINPGPFAQTRYAPVNWDHGEINDSTTVEPILDGPYQPT
TFTPPNDYWILINSNTNGVVYESTNNSDFWTAVVAIEPHVNPVDRQYMIFGESKQFNVSNDSENKWKFLE
MFRSSSQNEFYNNRRTLTSDTRLVGIFKYGGRVWTFHGETPRATTDSSSTANLNNISITIHSEFYIIPRSQESK
CNEYINNGLPPIQNTRNVVPLPLSSRSIQYKRAQVNEDIIVSKTSLWKEMQYNRDIIIRFKFGNSIVKMGGGL
GYKWSEISYKAANYQYNYLRDGEQVTAHTTCSVNGVNNFSYNGGFLPTDFGISRYEVIKENSYYVYVDY
WDDSKAFRNMVYVRSLAANLNSVKCTGGSYYFSIPVGAWPVMNGGAVSLHFAGVTLSTQFTDFVSLNS
LRFRLSLTVDEPPFSILRTRTVNLYGLPAANPNNGNEYEISGRFSLISLVPTNDDYQTPIMNSVTVRQDLE
RQLTDLREEFNLSQEIAMAQIDLALLPLDMFSMFSGIKSTIDLTKSMATSVMKKFRKSKLATSISEMTNS
LSDAASSSRNVSIRSNLSAISNWTNVSNVSNVTNSLNDISTQTSTISKKLRLKEMITQTEGMSFDDISAA
VLKTKIDMSTQIGKNTLPDIVTEASEKFIPKRSYRILKDDEVMEINTEGKFFAYKINTFDEVFPDVNKFael
VTDSPVISAIDFKTLKLNLDNYGITRTEALNLIKSNPNMLRNFINQNNPIIRNRIEQLILQCKL

Figure 33A
Schematic representation of construct number 1730

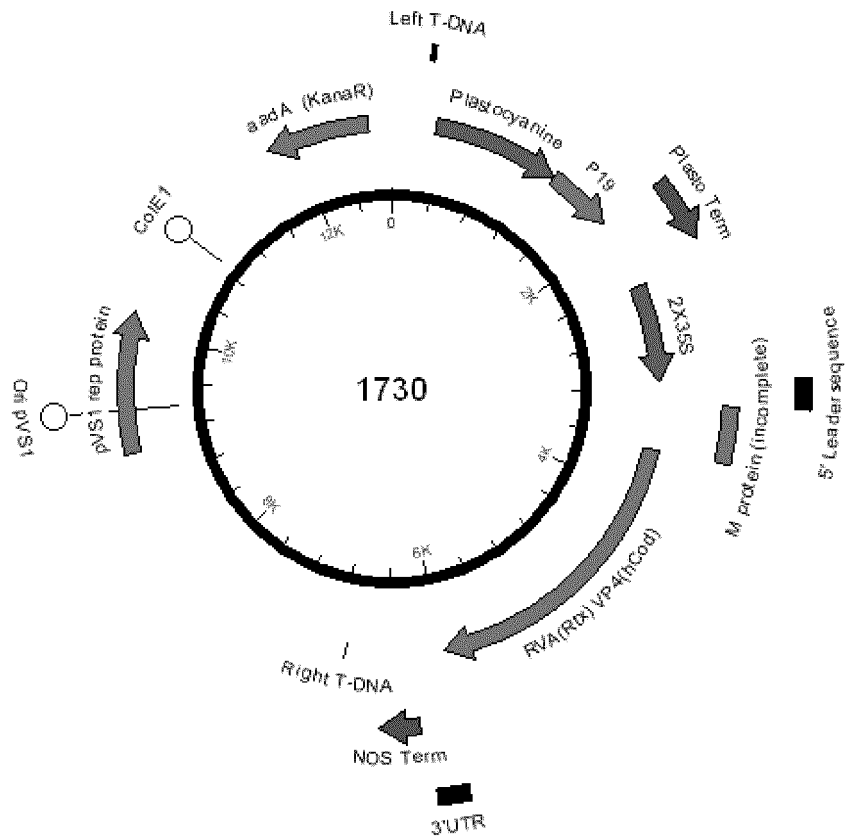
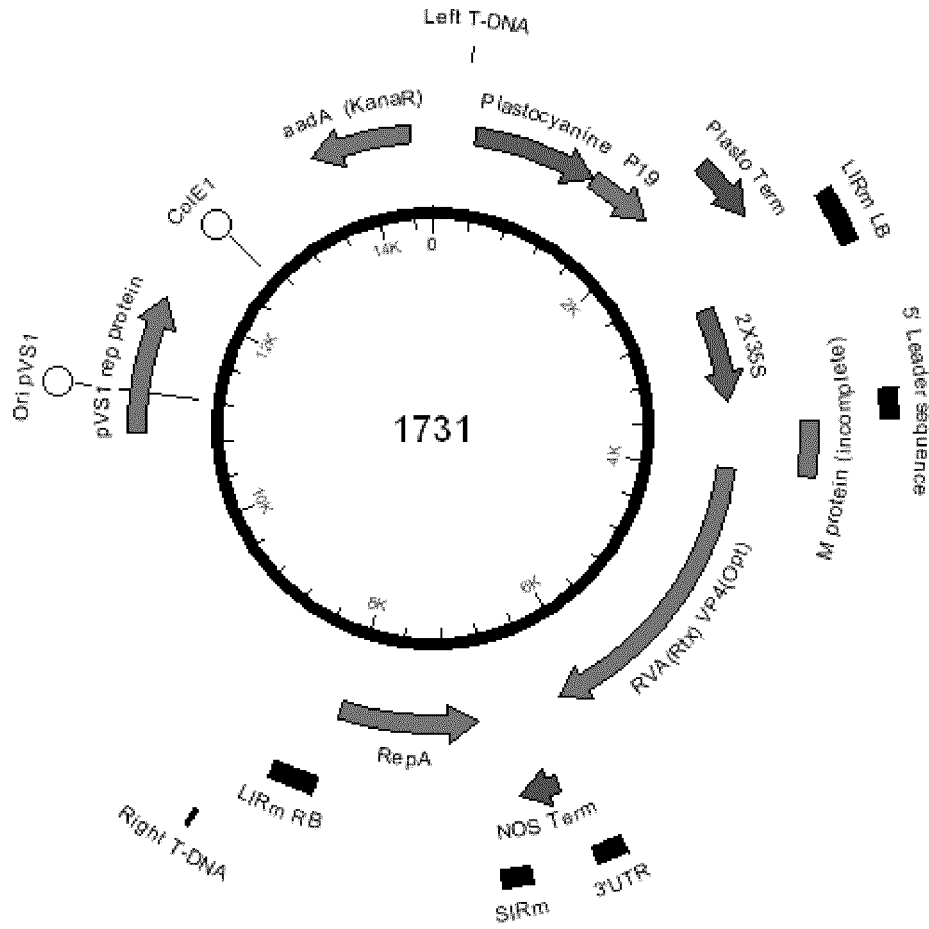


Figure 33B
Schematic representation of construct number 1731



F-2X35S/CPMV-HT/RVA(Rtx) VP7(Opt)/NOS (Construct number 1733)

Figure 34A, SEQ ID NO: 37

IF-Rtx_VP7(opt).s1+3c

AAATTTGTCGGGCCCCATGTACGGCATCGAGTATACAACAATTTTAATTTTC

Figure 34B, SEQ ID NO: 38

IF-Rtx_VP7(opt).s1-4r

ACTAAAGAAAATAGGCCTCTAAACGCGATAATAGAAGGCTGCTGAGTTCA
GGGA

Figure 34C, SEQ ID NO: 24

Expression cassette number 1733 from 2X35S promoter to NOS terminator. VP7 from Rotavirus A vaccine USA/Rotarix-A41CB052A/1988/G1P1A[8] strain is underlined.

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACC
AAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCAGC
TATCTGTACACTTTATTGTGAAGATAGTGGAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGAT
AAAGGAAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACG
AGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAAC
ATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGG
GCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCAGCTATCTG
TCACTTTATTGTGAAGATAGTGGAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGA
AAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGC
ATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTG
ACGTAAGGGATGACGCACAATCCCACTATCCTTCGCAAGACCCCTTCCTCTATATAAGGAAGTTCATTT
CATTGGAGAGGTATTAATCTTAATAGGTTTTGATAAAGCGAACGTGGGGAAACCCGAACCAAA
CCTTCTTCTAAACTCTCTCATCTCTCTTAAAGCAAACTTCTCTTGTCTTTCTTGCCTGAGCGATCT
TCAACGTTGTCAGATCGTCTCGGCACCAGTACAACGTTTTCTTTCACTGAAGCGAAATCAAAGATC
TCTTTGTGGACACGTAGTGCAGGCCATTAAATAACGTGTACTTGTCTTCTTGTCTGCTGCTGCTGCT
TGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTACGCCCCATACATTACTTGTACGATTCTGCTGACT
TTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTGTTGCCTGTACTTCTTCTTCTTCTT
TTGCTGATTGGTTCTATAAGAAATCTAGTATTTCTTTGAAACAGAGTTTTCCCGTGGTTTTCGAAGCTT
GGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCAAATTTGTCGGGCCCATGTACGGCATCGAGTAT
ACAACAATTTTAATTTTCTGATTTCCATCATTTCTGTTAAACTACATCCTTAAGTCCGTGACCAGAAAT
ATGGATTATATTATCTATCGTAGCCTCCTCATCTACGTGGCCCTTTTGGCCGTGACCAGGGCCCCAGAA
CTATGGCCTGAAGTTACCAATCACCGGTTCAATGGATACCGTTTACGCTAATTCCTCAAGAGGGG
ATATTTCTGACAAGTACCCTGTGCCTGTATTATCCAACAGAAGCCTCTACCCAGATCAATGATGGG
AGTGGAAGGATAGTCTCTCACAGATGTTCTTAACCAAGGGCTGGCCACCGGTTCCGTCTACTTCAA
GGAATACTCTAGTATTGTCGACTTCTCAGTTGACCCCGAGCTTTATTGCGACTACAACCTGGTACTTA
TGAAATACGACCAGAACCTGGAGCTGGATATGTCCGAGCTGGCTGACCTGATCCTCAATGAGTGGCT
GTGCAACCCCATGGACATCACATTATATTACTACCAGCAGTCTGGAGAATCCAACAAGTGGATCAGT
ATGGGCTCAAGTTGCACCGTGAAGGTGTGTCCTTGAACACCCAAATGCTGGGCATTGGTTGTGAGA
CAACTAATGTGGATTTCGTTTGAATGGTAGCCGAAAACGAGAAGCTGGCTATAGTGGACGTAGTCTGA
TGGGATTAACCACAAGATCAATCTGACTACCACCACTTGTACCATCAGAACTGTAAAAAGCTCGGC
CCCCGGGAGAACGTGCGCGTGATCCAGGTGGGGGGGAGCAATGTGCTCGACATTACTGCCGACCCTA
CCACCAATCCACAGACGGAACGGATGATGAGAGTCAACTGGAAGAAATGGTGGCAGGTCTTTATA
CCATTGTGGACTACATTAACCAGATTGTGCAAGTCATGAGTAAACGGTCCAGATCCCTGAAGTCAAGC
AGCCTTCTATTATCGCGTTTAGAGGCCTATTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATTT
CTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTTATGTAATTTAATTTCTTTGTGAGC
TCCTGTTTAGCAGGTGCTCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTATTAATAAAAAAAAAA
AAAAAAGACCGGAATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCAATAAAG
TTTCTTAAGATTGAATCCTGTTGCCGCTTGTGCGATGATTATCATATAATTTCTGTTGAATTACGTTAA
GCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTATGATTAGAGTCCCGC
AATTATACATTTAATACGCGATAGAAAACAAAAATATAGCGCGCAAACTAGGATAAATTATCGCGCGC
GGTGTCTATGTTACTAGAT

Figure 34D

Nucleotide sequence encoding VP7 from Rotavirus A vaccine USA/Rotarix-A41CB052A/1988/G1P1A[8] strain (SEQ ID NO: 48)

ATGTACGGCATCGAGTATACAACAATTTTAATTTTCCTGATTTCCATCATTCTGTAAACTACATCCTT
AAGTCCGTGACCAGAATTATGGATTATATTATCTATCGTAGCCTCCTCATCTACGTGGCCCTTTTTC
CCTGACCAGGGCCCAGAACTATGGCCTGAACCTACCAATCACCAGTTCAATGGATACCGTTTACGCT
AATTCCACTCAAGAGGGGATATTTCTGACAAGTACCCTGTGCCTGTATTATCCAACAGAAAGCCTCTAC
CCAGATCAATGATGGGGAGTGGAAGGATAGTCTCTCACAGATGTTCCCTAACCAAGGGCTGGCCCACC
GGTTCCGTCTACTTCAAGGAATACTCTAGTATTGTGCGACTTCTCAGTTGACCCCCAGCTTTATTGCGA
CTACAACCTGGTACTTATGAAATACGACCAGAACCTGGAGCTGGATATGTCCGAGCTGGCTGACCTG
ATCCTCAATGAGTGGCTGTGCAACCCCATGGACATCACATTATATTACTACCAGCAGTCTGGAGAAT
CCAACAAGTGGATCAGTATGGGCTCAAGTTGCACCGTGAAGGTGTGTCCCTTGAACACCCAAATGCT
GGGCATTGGTTGTGACACAATAATGTGGATTTCGTTTGAATGGTAGCCGAAAACGAGAAGCTGGCT
ATAGTGGACGTAGTCGATGGGATTAACCACAAGATCAATCTGACTACCACCACTTGTACCATCAGAA
ACTGTAAAAAGCTCGGCCCCCGGGAGAACGTCGCCGTGATCCAGGTGGGGGGGAGCAATGTGCTCG
ACATTACTGCCGACCCTACCACCAATCCACAGACGGAACGGATGATGAGAGTCAACTGGAAGAAAT
GGTGGCAGGTCTTTTATACCATTGTGGACTACATTAACCAGATTGTGCAAGTCATGAGTAAACGGTC
CAGATCCCTGAACTCAGCAGCCTTCTATTATCGCGTTTAG

Figure 34E

Optimized coding sequence of Rotavirus A VP7 from strain
RVA/Vaccine/USA/Rotarix-A41CB052A/1988/G1P1A[8] (SEQ ID NO 54)

ATGTACGGCATCGAGTATACAACAATTTTAATTTTCCTGATTTCCATCATTCTGTAA
AACTACATCCTTAAGTCCGTGACCAGAATTATGGATTATATTATCTATCGTAGCCTC
CTCATCTACGTGGCCCTTTTTCGCCCTGACCAGGGCCCAGAACTATGGCCTGAACCTTA
CCAATCACCAGTTCAATGGATACCGTTTACGCTAATTCCACTCAAGAGGGGATATTT
CTGACAAGTACCCTGTGCCTGTATTATCCAACAGAAAGCCTCTACCCAGATCAATGAT
GGGGAGTGGAAGGATAGTCTCTCACAGATGTTCCCTAACCAAGGGCTGGCCCACCGGT
TCCGTCTACTTCAAGGAATACTCTAGTATTGTGCGACTTCTCAGTTGACCCCCAGCTT
TATTGCGACTACAACCTGGTACTTATGAAATACGACCAGAACCTGGAGCTGGATATG
TCCGAGCTGGCTGACCTGATCCTCAATGAGTGGCTGTGCAACCCCATGGACATCACA
TTATATTACTACCAGCAGTCTGGAGAATCCAACAAGTGGATCAGTATGGGCTCAAGT
TGCACCGTGAAGGTGTGTCCCTTGAACACCCAAATGCTGGGCATTGGTTGTGACACA
ACTAATGTGGATTTCGTTTGAATGGTAGCCGAAAACGAGAAGCTGGCTATAGTGGAC
GTAGTCGATGGGATTAACCACAAGATCAATCTGACTACCACCACTTGTACCATCAGA
AACTGTAAAAAGCTCGGCCCCCGGGAGAACGTCGCCGTGATCCAGGTGGGGGGGAGC
AATGTGCTCGACATTACTGCCGACCCTACCACCAATCCACAGACGGAACGGATGATG
AGAGTCAACTGGAAGAAATGGTGGCAGGTCTTTTATACCATTGTGGACTACATTAAC
CAGATTGTGCAAGTCATGAGTAAACGGTCCAGATCCCTGAACTCAGCAGCCTTCTAT
TATCGCGTTTAG

Figure 35, SEQ ID NO: 39

Amino acid sequence of VP7 from Rotavirus A vaccine USA/Rotarix-A41CB052A/1988/G1P1A[8] strain

MYGIEYTTILIFLISHILLNYILKSVTRIMDYIYRSLIYVALFALTRAQNYGLNLPITGSMDTVYANSTQEGI
FLTSTLCLYYPTEASTQINDGEWKDSLQMFLLTKGWPTGSVYFKEYSSIVDFSVDPQLYCDYNLVLMKYD
QNLGLDMSSELADLILNEWLCNPMIDITLYYYQQSGESNKWISMGSSCTVKVCPLNTQMLGIGCQTTNVDS
FEMVAENEKLAIVDVVDGINHKINLTTTCTIRNCKKLGPRENVAVIQVGGSNVLDITADPTTNPQTERM
MRVNWKKWWQVFYTIVDYINQIVQVMSKRSLNSAAFYRV

Figure 36

Schematic representation of construct number 1733

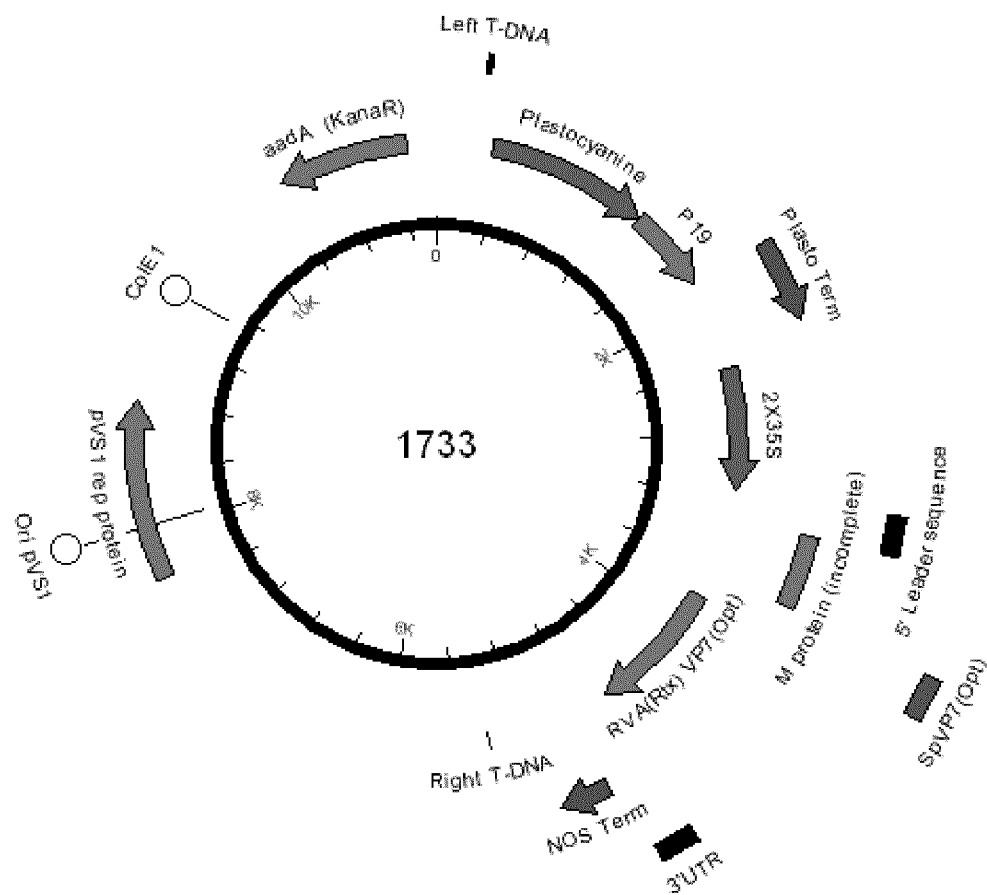


Figure 39, SEQ ID NO: 41

Construct 1192 from left to right t-DNA borders (underlined). 2X35S/CPMV-HT/PDISP/NOS with Plastocyanine-P19-Plastocyanine silencing inhibitor expression cassette

TGGCAGGATATATTGTGGTGTAAACAAATTGACGCTTAGACAACTTAATAACACATTGCGGACGTTT
 TTAATGTACTGAATTAACGCCGAATCCCCGGGCTGGTATATTTATATGTTGTCAAATAACTCAAAAACC
 ATAAAAAGTTTAAGTTAGCAAGTGTGTACATTTTACTTTGAACAAAAATATTCACCTACTACTGTTATA
 AATCATTATTAACATTAGAGTAAAGAAATATGGATGATAAGAACAAGAGTAGTGATATTTTGACAA
 CAATTTTGTGCAACATTTGAGAAAAATTTGTTGTCTCTCTTTTCATTGGTCAAAAACAATAGAGAG
 AGAAAAAGGAAGAGGGAGAATAAAAAACATAATGTGAGTATGAGAGAGAAAGTTGTACAAAAGTTG
 TACCAAAATAGTTGTACAAATATCATTGAGGAATTTGACAAAAGCTACACAAATAAGGGTTAATTGC
 TGTAATAATAAAGGATGACGCATTAGAGAGATGTACCATTAGAGAATTTTGGCAAGTCATTAAAA
 AGAAAGAATAAATTATTTTAAAAATTAAGTTGAGTCATTTGATTAAACATGTGATTATTTAATGAA
 TTGATGAAAAGAGTTGGATTAAAGTTGTATTAGTAATTAGAATTTGGTGTCAAATTTAATTTGACATTT
 GATCTTTTCTATATATTGCCCATAGAGTCAGTTAACTCATTTTATATTTTCATAGATCAAATAAGA
 GAAATAACGGTATATTAATCCCTCCAAAAAAGCGGTATATTTACTAAAAAATCTAAGCCACG
 TAGGAGGATAACAGGATCCCCGTAGGAGGATAACATCCAATCCAACCAATCACAACAATCCTGATG
 AGATAACCCACTTTAAGCCACGCATCTGTGGCACATCTACATTATCTAAATCACACATTCTTCCACA
 CATCTGAGCCACACAAAAACCAATCCACATCTTTATCACCCATTCTATAAAAAATCACACTTTGTGAG
 TCTACACTTTGATTCCCTTCAAACACATACAAAGAGAAGAGACTAATTAATTAATCATCTTGAG
 AGAAAAATGGAACGAGCTATACAAGGAAACGACGCTAGGGAACAAGCTAACAGTGAACGTTGGGATG
 GAGGATCAGGAGGTACCACTTCTCCCTTCAAACCTTCTGACGAAAGTCCGAGTTGGACTGAGTGGCG
 GCTACATAACGATGAGACGAATTCGAATCAAGATAATCCCTTGGTTTCAAGGAAAGCTGGGGTTTC
 GGGAAAGTTGTATTAAAGAGATATCTCAGATACGACGAGCGGAAGCTTCACTGCACAGAGTCTGTG
 GATCTTGGACGGGAGATTCCGGTTAACTATGCAGCATCTCGATTTTTCGGTTTCGACGACGATCGGATGT
 ACCTATAGTATTCGGTTTCGAGGAGTTAGTATCACCGTTTCTGGAGGGTCGCGAACTCTTCAGCATCT
 CTGTGAGATGGCAATTCGGTCTAAGCAAGAACTGCTACAGCTTGCCCAATCGAAGTGGAAGTAAT
 GTATCAAGAGGATGCCCTGAAGGTACTCAAACCTTCGAAAAAGAAAGCGAGTAAGTTAAAAATGCTT
 CTTCTCTCTATTTATAATATGGTTTGTATTGTTAATTTTGTCTTGTAGAAGAGCTTAATTAATCG
 TTGTTGTTATGAAATACTATTTGTATGAGATGAACCTGGTGTAAATGTAATTCATTTACATAAGTGGAGT
 CAGAATCAGAATGTTTCTCCATAACTAAGTACATGAAGACCTGCCGCGTACAATGTCTTATATT
 TGAACAATAAAATTGAACATCTTTTGCCACAACCTTTATAAGTGGTTAATATAGCTCAAATATATGGT
 CAAAGTTCAATAGATTAATAATGGAAATATCAGTTATCGAAATTCATTAACAATCAACTTAACGTTATT
 AACTACTAATTTTATATCATCCCTTTTGATAAATGATAGTACACCAATTAGGAAGGAGCATGCTCGCC
 TAGGAGATTGTCTGTTTCCCGCCTTCAGTTTGCAAGCTGCTCTAGCCGTGTAGCCAATACGCAAAACCGC
 CTCTCCCCGCGCGTTGGGAATTACTAGCGCGTGTGACAAGCTTGCATGCCGCTCAACATGGTGGAG
 CACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAAGGGCAATTGAG
 ACTTTTCAACAAAGGGTAATATCCGGAACCTCTCGGATTCCATTGCCAGCTATCTGTCACTTTAT
 TGTGAAGATAGTGGAAAAGGAAGGTGGCTCTACAAATGCCATCATTGCGATAAAGGAAAGGCCAT
 CGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAGATGGACCCCAACCCACGAGGAGCATCGTGGAA
 AAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACGAC
 ACCTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAAGGGCAATTGAGACTTTTC
 AACAAAGGGTAATATCCGGAACCTCTCGGATTCCATTGCCAGCTATCTGTCACTTTATTGTGAAG
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 GACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACCTAAGGGATGACG
 CACAATCCCACTATCCTTCGCAAGACCTTCTCTATATAAGGAAGTTTCATTTTCAATTTGGAGAGGTAT
 TAAAACTTAATAGGTTTGTGATAAAGCGAACGTGGGGAAACCCGAACCAACCTTCTTCTAACTC
 TCTCTCATCTCTTAAAGCAAACCTTCTCTTGTCTTCTTGTGCGTGAGCGATCTTCAACGTTGTGAGA
 TCGTGTCTCGGCACCAGTACAACGTTTCTTCTACTGAAGCGAAATCAAAGATCTCTTTGTGGACACG
 TAGTGCGGCGCCATTAAATAACGTGTACTTGTCTATTCTTGTGCGGTGTGGTCTTGGGAAAAAGAAAGC
 TTGCTGGAGGCTGCTGTTACGCCCCATACATTACTTGTACGATTCTGCTGACTTTCGGCGGGTGCAA
 TATCTCTACTTCTGCTTACGAGGTATTGTTGCCTGTACTTCTTCTTCTTCTTCTGCTGATTGGTTCT
 ATAAGAAATCTAGTATTTCTTTGAAACAGAGTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTT
 AAGCTTCTGTATATTCTGCCAAATTTGTGCGGCCCATGGCGAAAAACGTTGCGATTTCGCGCTTATT
 GTTTCTCTTCTTGTGTTGTTCTTCTCAGATCTTCGCGCGGCTCTCAGCCAAAACGACACCCCA
 TCTGTCTATCCACTGGCCCTGGATCTGCTGCCCAAACTAACTCCATGGTGACCCTGGGATGCCTGGT
 CAAGGGCTATTTCCCTGAGCCAGTGACAGTGACCTGGAACCTCTGGATCCCTGTCCAGCGGTGTGCAC
 ACCTTCCCAGCTGTCTGCACTGTGACCTCTACACTCTGAGCAGCTCAGTGACTGTCCCTCCAGCAC
 CTGGCCCGCAGGACCGTCACCTGCAACGTTGCCACCCGCGCCAGCAGCACCAAGGTGGACAAGAA
 AATTGTGCCAGGGATTGTGGTTGTAAGCCTTGACATATGTACAGTCCAGAAGTATCATCTGTCTTCA
 TCTTCCCCCAAGGCCAAGGATGTGCTCACCATTACTCTGACTCCTAAGGTCACGTGTGTTGTGGTA
 GACATCAGCAAGGATGATCCCGAGGTCCAGTTCAGCTGGTTGTAGATGATGTGGAGGTGCACACAG
 CTCAGACGCAACCCCGGGAGGAGCAGTTCAACAGCACTTCCGCTCAGTCAGTGAACCTCCCATCAT

GCACCAGGACTGGCTCAATGGCAAGGAGCGATCGCTCACCATCACCATCACCATCACCATCACCATT
 AAAGGCCTATTTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTT
 TCTGTGCTCAGAGTGTGTTTATTTTATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCAGGTGCTCC
 CTTTCAGCAAGGACACAAAAAGATTTTAAATTTTATTAATAAAAAAAAAAAAAAAAAAGACCGGAATTCG
 ATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCAATAAAGTTTCTTAAGATTGAATCCTG
 TTGCCGGTCTTGCGATGATTATCATATAATTTCTGTTGAATTACGTTAAGCATGTAATAATTAACATG
 TAATGCATGACGTTATTTATGAGATGGGTTTTATGATTAGAGTCCCGCAATTATACATTTAATACGC
 GATAGAAAAACAAAATATAGCGCGCAAACTAGGATAAATTATCGCGCGCGGTGTCATCTATGTTACTA
 GATCTCTAGAGTCTCAAGCTTGGCGCGCCACGTGACTAGTGGCACTGGCCGTCGTTTTACAACGTCG
 TGACTGGGAAAAACCTGGCGTTACCCAACTTAATCGCCTTGCAGCACATCCCCCTTCGCCAGCTGGC
 GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGCTA
 GAGCAGCTTGAGCTTGGATCAGATTGTCGTTTCCCGCCTTCAGTTTAACTATCAGTGTGACAGGA
 TATATTGGCGGGTAAACCTAAGAGAAAAGAGCGTTTA

Figure 40A, SEQ ID NO:42

Expression cassette number 1735 from 2X35S promoter to NOS terminator.
 PDISP/VP7(opt) from Rotavirus A vaccine USA/Rotarix-
 A41CB052A/1988/G1P1A[8] strain is underlined.

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACC
 AAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAACCTCCTCGGATTCCATTGCCAGC
 TATCTGTCACTTTATTGTGAAGATAGTGGAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGAT
 AAAGGAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACG
 AGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCCTCAAAGCAAGTGGATTGATGTGATAAC
 ATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGG
 GCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAACCTCCTCGGATTCCATTGCCAGCTATCTG
 TCACCTTTATTGTGAAGATAGTGGAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGA
 AAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGC
 ATCGTGGAAAAAGAAGACGTTCCAACCACGTCCTCAAAGCAAGTGGATTGATGTGATATCTCCACTG
 ACGTAAGGGATGACGCACAATCCCACTATCCTTCGCAAGACCCCTCCTCTATATAAGGAAGTTCATTT
 CATTGGAGAGGTATTAATATCTTAATAGGTTTGTATAAAGCGAACGTGGGGAAACCCGAACCAAA
 CCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAGCAAACCTTCTCTTGTCTTTCTTGCCTGAGCGATCT
 TCAACGTTGTCAGATCGTGCTTCGGCACCAAGTACAACGTTTCTTTCACTGAAGCGAAATCAAAGATC
 TCTTTGTGGACACGTAAGTGGCGGCCATTAAATAACGTGTACTTGTCTATTCTTGTGCGTGTGGTCT
 TGGGAAAAAGAAAGCTTGTGAGGCTGCTGTTACGCCCCATACATTACTTGTACGATTCTGCTGACT
 TTCGGCGGGTGCAATATCTCTACTTCTGCTTACGAGGTATTGTTGCCTGTACTTCTTCTTCTTCTTCT
 TTGCTGATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGAGTTTTCCCGTGGTTTTCAAGATT
 GGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTGGGCCCCATGGCGCAAAACCGTTGC
GATTTTCGGCTTATTGTTTTCTTCTTGTGTTGGTTCCTTCTCAGATCTTCGCCCAGAACTATGGCCT
GAACCTTACCAATCACCGGTTCAATGGATACCGTTACGCTAATTCCACTCAAGAGGGGATATTTCTGA
CAAGTACCCTGTGCCTGTATTATCCAACAGAAAGCCTCTACCCAGATCAATGATGGGGAGTGGAAAGGA
TAGTCTCTCAGATGTTCCTAACCAAGGGCTGGCCACCGGTTCCGTCTACTTCAAGGAATACTCTA
GTATTGTGCACTTCTCAGTTGACCCCGAGCTTTATTGCGACTACAACCTGGTACTTATGAAATACGAC
CAGAACCTGGAGCTGGATATGTCCGAGCTGGCTGACCTGATCCTCAATGAGTGGCTGTGCAACCCCA
TGGACATCACATTATATTACTACCAGCAGTCTGGAGAATCCAACAAGTGGATCAGTATGGGCTCAAG
TTGCACCGTGAAGGTGTGTCCTTGAACACCCAAATGCTGGGCATTGGTTGTCAGACAACTAATGTG
GATTGTTTTGAAATGGTAGCCGAAAACGAGAAGCTGGCTATAGTGGACGTAAGTGGATGAGTAAACC
ACAAGATCAATCTGACTACCACCACTTGTACCATCAGAAACTGTAAAAAGCTCGGCCCCCGGGAGAA
CGTCGCCGTGATCCAGGTGGGGGGGAGCAATGTGCTCGACATTACTGCCGACCCTACCACCAATCCA
CAGACGGAACGGATGATGAGAGTCAACTGGAAGAAATGGTGGCAGGTCTTTATACCATTTGTGGACT
ACATTAACCAGATTGTGCAAGTCATGAGTAAACGGTCCAGATCCCTGAACCTCAGCAGCCTTCTATTA
TCGCGTTTTAGAGGCCTATTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGT
 AGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCA
 GGTCGTCCCTTCAGCAAGGACACAAAAAGATTTTAAATTTTATTAATAAAAAAAAAAAAAAAAAAGACCG
 GGAATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCAATAAAGTTTCTTAAGATT
 GAATCCTGTTGCCGGTCTGCGATGATTATCATATAATTTCTGTTGAATTACGTTAAGCATGTAATAA
 TTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTATGATTAGAGTCCCGCAATTATACATT
 TAATACGCGATAGAAAACAAAATATAGCGCGCAAACTAGGATAAATTATCGCGCGCGGTGTCATCTA
 TGTTACTAGAT

Figure 40B

Nucleotide sequence encoding PDISP/VP7(opt) from Rotavirus A vaccine USA/Rotarix-A41CB052A/1988/G1P1A[8] strain (SEQ ID NO: 62)

```
ATGGCGAAAAACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTTGGTTCCCTTCTCAGATCTTC
GCCCAGAACTATGGCCTGAACCTACCAATCACCGTTCAATGGATACCGTTTACGCTAATTCCACTCA
AGAGGGGATATTTCTGACAAGTACCCTGTGCCTGTATTATCCAACAGAAGCCTCTACCCAGATCAAT
GATGGGGAGTGGAAGGATAGTCTCTCACAGATGTTCTTAACCAAGGGCTGGCCCACCGGTTCCGTCT
ACTTCAAGGAATACTCTAGTATTGTGCGACTTCTCAGTTGACCCCCAGCTTTATTGCGACTACAACCTG
GTACTTATGAAATACGACCAGAACCTGGAGCTGGATATGTCCGAGCTGGCTGACCTGATCCTCAATG
AGTGGCTGTGCAACCCCATGGACATCACATTATATTACTACCAGCAGTCTGGAGAATCCAACAAGTG
GATCAGTATGGGCTCAAGTTGCACCGTGAAAGGTGTGTCCCTTGAACACCCAAATGCTGGGCATTGGT
TGTCAGACAACTAATGTGGATTTCGTTTGAAATGGTAGCCGAAAACGAGAAGCTGGCTATAGTGGACG
TAGTCGATGGGATTAACCACAAGATCAATCTGACTACCACCACTTGTACCATCAGAAACTGTAAAAA
GCTCGGCCCCCGGGAGAACGTCGCCGTGATCCAGGTGGGGGGGAGCAATGTGCTCGACATTACTGCC
GACCCTACCACCAATCCACAGACGGAACGGATGATGAGAGTCAACTGGAAGAAATGGTGGCAGGTC
TTTTATACCATTGTGGACTACATTAACCAGATTGTGCAAGTCATGAGTAAACGGTCCAGATCCCTGAA
CTCAGCAGCCTTCTATTATCGCGTTTAG
```

Figure 41, SEQ ID NO: 43

Amino acid sequence of PDISP/VP7 from Rotavirus A vaccine USA/Rotarix-A41CB052A/1988/G1P1A[8] strain

```
MAKNVAIFGLLFSLLVLVPSQIFAQNYGLNLPITGSMDTVYANSTQEGIFLTSTLCLYYPT EASTQINDGE
WKDSLSQMFLTKGWPTGSVYFKEYSSIVDFSVDPLQYCDYNLVLWKYDQNL ELDMS ELADLILNEWLC
NPM DITLYYYQQSGESNKWISMGSSCTVKVCPLNTQMLGIGCQTTNVDSFEMVAENEKLAIVDVVDGIN
HKINLTTTCTIRNCKKLGPRENVAVIQVGGSNVL DITADPTTNPQTERMMRVNWKKWWQVFYTIVDYI
NQIVQVMSKRSLNSAAFYYRV
```

Figure 42

Schematic representation of construct number 1735

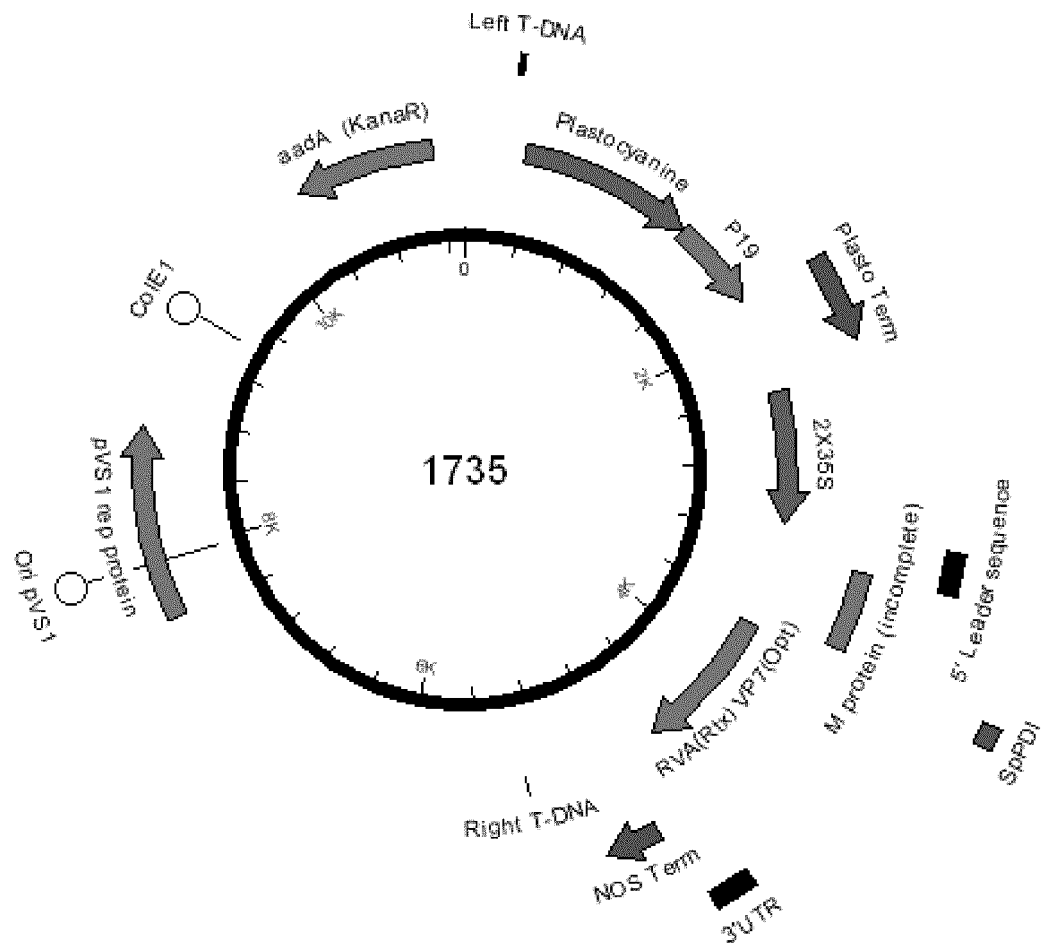


Figure 43A

Coding sequence of Rotavirus A VP4 from strain
RVA/Simian-tc/ZAF/SA11-H96/1958/G3P5B[2] (SEQ ID NO: 50)

```
ATGGCTTCGCTCATTATAGACAATTGCTCACGAATTCTTATACAGTAGATTTATCC
GATGAGATACAAGAGATTGGATCAACTAAATCACAAAATGTCACAATTAATCCTGGA
CCATTTGCGCAAACAGGTTATGCTCCAGTTAACTGGGGACCTGGAGAAATTAATGAT
TCTACGACAGTTGAACCATTGCTGGATGGGCCTTATCAACCAACGACATTCAATCCA
CCAGTCGATTATTGGATGTTACTGGCTCCAACGACACCTGGCGTAATTGTTGAAGGT
ACAAATAATACAGATAGATGGTTAGCCACAATTTTAATCGAGCCAAATGTTTCAGTCT
GAAAATAGAACTTACACTATATTTGGTATTCAAGAACAATTAACGGTATCCAATACT
TCACAAGACCAGTGGAAATTTATTGATGTCGTAAAAACAACGCAAATGGAAGTATA
GGACAATATGGACCATTACTATCCAGTCCGAAATTATATGCAGTTATGAAGCATAAT
GAAAAATTATATACATATGAAGGACAGACACCTAACGCTAGGACAGCACATTATTCA
ACAACGAATTATGATTCTGTTAATATGACTGCTTTTTGTGACTTTTATATAATTCCT
AGATCTGAAGAGTCTAAATGTACGGAATACATTAATAATGGATTACCACCAATACAA
AATACTAGAAATGTTGTACCATTATCGTTGACTGCTAGAGATGTAATACACTATAGA
GCTCAAGCTAATGAAGATATTGTGATATCCAAGACATCATTGTGGAAAGAAATGCAA
TATAATAGAGATATAACTATTAGATTTAAATTTGCAAATACAATTATAAAATCAGGA
GGGCTGGGATATAAGTGGTCAGAAATATCATTTAAGCCAGCGAATTATCAATACACA
TATACTCGTGATGGTGAAGAAGTTACCGCACATACTACTTGTTCAGTGAATGGCGTT
AATGACTTCAGTTTTAATGGAGGATATTTACCAACTGATTTTGTGTATCTAAATTT
GAAGTAATTAAAGAGAATTCATACGTCTATATCGATTACTGGGATGATTACAAAGCA
TTTCGTAACGTGGTGTATGTCCGATCGTTAGCAGCAAACCTGAATTCAGTTATGTGT
ACTGGAGGCAGCTATAATTTTAGTCTACCAGTTGGACAATGGCCTGTTTTAACTGGG
GGAGCAGTTTCTTTACATTTCAGCTGGTGTAACTATCTACTCAATTTACAGATTTT
GTATCATTAATTCATTAAGATTTAGATTTAGACTAGCTGTCGAAGAACCACACTTT
AACTGACTAGAACTAGATTAGATAGATTGTATGGTCTGCCTGCTGCAGATCCAAAT
AATGGTAAAGAATATTATGAAATTGCTGGACGATTTTCACTTATATCATTAGTGCCA
TCAAATGATGACTATCAGACTCCTATAGCAAACCTCAGTTACTGTACGACAAGATTTA
GAAAGGCAGTTAGGAGAACTAAGAGAAGAGTTTAAACGCTTTGTCTCAAGAAATTGCA
ATGTCGCAGTTAATCGATTTAGCGCTTCTACCATTAGATATGTTCTCAATGTTTTCT
GGCATTAAAAGTACTATTGATGCTGCAAAATCAATGGCTACTAATGTTATGAAAAAA
TTCAAAAAGTCAGGATTAGCGAATTCAGTTTCAACACTGACAGATTCTTTATCAGAC
GCAGCATCATCAATATCAAGAGGTTTCATCTATACGTTTCGATTGGATCTTCAGCATCA
GCATGGACGGATGTATCAACACAAATAACTGATATATCGTCATCAGTAAGTTCAGTT
TCGACACAAACGTCAACTATCAGTAGAAGATTGAGACTAAAGGAAATGGCAACACAA
ACTGAGGGTATGAATTTTGATGATATATCAGCGGCTGTTTTGAAGACTAAGATAGAT
AAATCGACTCAAATATCACCAAACACAATACCTGACATTGTTACTGAAGCATCGGAA
AAATTCATACCAAATAGGGCTTACCGTGTTATAAACAACGATGATGTGTTTGAAGCT
GGAATTGATGGAAAATTTTTTGCTTATAAAGTGGATACATTTGAGGAAATACCATTT
GATGTACAAAAATTCGCTGACTTAGTTACAGATTCTCCAGTAATATCCGCTATAATT
GATTTTAAACACTTAAAAATTTGAACGATAATTACGGCATTACTAAGCAACAAGCA
TTTAATCTTTTAAGATCTGACCCAAGAGTTTTACGTGAATTCATTAATCAGGACAAT
CCTATAATTAGAAATAGAATTGAACAACCTGATTATGCAATGCAGGTTGTGA
```

Figure 43B

Optimized coding sequence of Rotavirus A VP4 from strain
RVA/Simian-tc/ZAF/SA11-H96/1958/G3P5B[2] (SEQ ID NO : 51)

ATGGCTTCATTGATATATCGCCAGTTGCTGACTAATAGCTATACTGTGGATTTGTCA
 GACGAAATCCAGGAAATAGGATCCACAAAGAGTCAGAACGTGACCATAAACCCCGGA
 CCGTTTCGCCCAGACTGGGTATGCCCCCGTAAACTGGGGCCCCGGCGAGATTAACGAC
 AGCACCACCGTGGAGCCACTGCTGGATGGACCCTACCAACCCACTACTTTTAATCCT
 CCAGTGGACTACTGGATGTTGTTGGCTCCACGACACCTGGTGTAATTGTAGAGGGC
 ACCAACAATACCGATCGCTGGCTGGCGACAATACTGATAGAACCCAACGTGCAGTCC
 GAGAACAGAACCTATAACCATTTTCGGCATCCAGGAACAGCTAACCGTGAGCAATACG
 AGCCAGGACCAGTGGAAAGTTTATCGATGTAGTGAAAACCTACGGCCAATGGATCTATC
 GGGCAATACGGGCGCTGCTGTCTCACCTAAGCTCTACGCCGTGATGAAACATAAT
 GAGAACTGTACACTTACGAGGGCCAAACCCCAATGCCAGAACTGCCACTACAGT
 ACAACCAACTATGACTCGGTGAACATGACAGCGTTCTGTGATTTTTATATTATCCA
 AGATCAGAAGAATCCAAGTGTACTGAGTACATCAACAATGGACTTCCACCCATCCAG
 AACACTCGAAATGTCGTCCCACTGTCTCTAACTGCTCGGGATGTGATCCACTATCGC
 GCCAAGCTAATGAGGATATAGTCATTTCAAAGACGAGCTTATGGAAGGAAATGCAG
 TATAACAGAGACATCACAATCAGGTTCAAGTTCGCCAATACTATTATTAAGTCCGGG
 GGAAGTGGGGTACAAATGGAGTGAGATCAGTTTTAAGCCCGCTAACTATCAGTACACC
 TATACTCGCGACGGCGAAGAGGTAACCGCCCACACAACCTTGCTCGGTTAATGGCGTG
 AACGATTTTAGCTTCAACGGGGGCTACCTGCCTACTGATTTTCGTGGTGAGCAAGTTT
 GAAGTCATCAAGGAAAATTCCTACGTGTATATTGACTACTGGGATGATAGCCAGGCC
 TTCCGAAATGTTGTGTATGTTAGATCACTGGCCGCAAACCTTAATTCAGTCATGTGC
 ACAGGAGGTTCTTACAATTTTAGTCTTCCCGTCGGGCAGTGGCCAGTGCTCACAGGG
 GGCCTGTGAGCTTGCATTCCGCCGGAGTCACCTTGAGTACTCAGTTCACAGACTTT
 GTGTCTCTGAATAGCCTAAGGTTTCAAGTTTACTGAGTGTGAGTGTGAGTGTGAGTGT
 AAGCTCACTCGTACGAGGCTGGATCGGCTGTACGGCCTGCCGGCCGCTGATCCCAAT
 AACGGCAAGGAATATTACGAGATAGCCGGGAGATTTTCGCTGATCAGTCTGGTGCCG
 TCAAACGATGATTACCAGACCCCAATTGCCAACAGTGTCACTGTCAGGCAAGATCTG
 GAGAGACAACTTGGCGAGCTGAGAGAGGAGTTCAACGCCCTGTCTCAAGAGATCGCA
 ATGTCTCAGCTCATTGACCTGGCCCTGTTACCCCTCGACATGTTCTCAATGTTCTCC
 GGCATAAAATCCACTATCGACGCTGCAAAGTCCATGGCCACAAATGTGATGAAGAAG
 TTTAAGAAGAGCGGTCTGGCAAATAGCGTGTCTACGCTGACCGATAGTTTGTCCGAT
 GCCGCCAGTTCATTAGCCGTGGATCCAGCATTAGGTCCATTGGCTCTTCCGCCCTCT
 GCTTGGACTGACGTGAGTACACAGATAACTGACATTTCTCTGTCTCCAGTGTG
 AGCACACAACTTCCACGATATCAAGACGACTGAGGCTCAAAGAGATGGCAACGCAA
 ACGGAAGGTATGAATTTTGATGACATCAGCGCCGAGTTTTGAAGACAAAGATCGAT
 AAAAGCACTCAAATTAGCCCCAATACGATCCCTGACATTGTGACTGAGGCATCTGAA
 AAGTTCATTCCCAACCGTGCTTATCGGGTCATTAACAATGATGATGTCTTCGAGGCC
 GGCATCGATGGCAAGTTTTTTGCTTATAAAGTGGATACCTTCGAGGAGATTCTTTTC
 GATGTACAGAAGTTTGCTGACCTCGTAACGGATAGCCCAGTGATAAGCGCCATTATA
 GACTTCAAACATTGAAAAATTTGAACGATAATTATGGTATTACCAAGCAGCAGGCT
 TTTAACTTGTTAAGATCTGACCCTCGCGTGCTCAGAGAGTTTATTAACCAGGACAAC
 CCCATCATCAGAAACAGGATCGAGCAGCTGATTATGCAGTGTGCCTGTAA

Figure 43C

Coding sequence of Rotavirus A VP7 from strain
 RVA/Simian-tc/ZAF/SA11-H96/1958/G3P5B[2] (SEQ ID NO : 52)

ATGTATGGTATTGAATATACCACAGTTCTAACCTTTCTGATATCGATTATTCTACTA
 AATTACATACTTAAATCATTAACCTAGATAATGGACTTTATAATTTATAGATTTCTT
 TTTATAATTGTGATATTGTCACCATTTCTCAGAGCACAAAATTATGGTATTAACTCTT
 CCAATCACAGGCTCCATGGACACTGCATACGCTAATTCAACGCAAGAAGAAACATTC

CTCACTTCTACACTTTGCCTATATTATCCGACTGAGGCTGCGACTGAAATAAACGAT
 AATTCATGGAAAGACACACTGTCACAACATTTTCTTACGAAAGGGTGGCCAACTGGA
 TCCGTATATTTTAAAGAATATACTAACATTGCATCGTTTTCTGTTGATCCGCAGTTG
 TATTGTGATTATAACGTAGTACTAATGAAATATGACGCGACGTTGCAATTGGATATG
 TCAGAACTTGCGGATCTAATATTAAACGAATGGTTGTGTAATCCAATGGATATTACT
 CTGTATTATTATCAGCAAACCTGACGAAGCGAATAAATGGATATCAATGGGCTCATCA
 TGTACAATTAAAGTATGTCCACTTAATACACAAACTCTTGGAATTGGATGCTTGACA
 ACTGATGCTACAACCTTTTGAAGAAGTTGCGACAGCTGAAAAGTTGGTAATTACTGAC
 GTGGTTGATGGCGTTAATCATAAGCTGGATGTCACAACAGCAACGTGTACTATTAGA
 AACTGTAAGAAATTGGGACCAAGAGAAAACGTAGCCGTTATACAAGTTGGTGGTTCT
 GACATCCTCGATATAACTGCTGATCCAACCTACTGCACCACAGACAGAACGGATGATG
 CGAATTAACCTGGAAAAAATGGTGGCAAGTTTTTTTATACTGTAGTAGACTATGTAGAT
 CAGATAATACAAGTTATGTCCAAAAGATCAAGATCACTAAATTCAGCAGCATTTTAT
 TACAGAGTGTAG

Figure 43D

Optimized coding sequence of Rotavirus A VP7 from strain
 RVA/Simian-tc/ZAF/SA11-H96/1958/G3P5B[2] (SEQ ID NO :53)

ATGTACGGAATCGAGTATACCACCGTTCTGACATTTCTTATTAGTATTATCCTCTTG
 AACTATATTCTGAAGTCACTTACCCGGATAATGGATTTTATTATATATAGGTTTCTG
 TTCATCATTTGTAATTCTGAGCCCTTTCTGAGGGCCAGAAATTACGGCATAAACCTA
 CCAATCACCGGTTCTATGGATACCGCTTATGCTAACTCTACACAAGAGGAGACATTC
 CTCACATCAACCCTATGCCTGTACTATCCGACTGAAGCAGCCACAGAGATAAACGAT
 AACTCTTGGAAGATACATTGAGCCAGCTCTTCCTGACTAAGGGATGGCCACCGGA
 TCGGTCTACTTTAAGGAGTACACAAACATCGCAAGTTTCAGCGTGGATCCCCAGCTG
 TATTGTGATTATAACGTTGTGCTGATGAAATACGACGCAACCCTCCAGCTTGACATG
 AGCGAGTTGGCAGACCTAATCCTCAATGAGTGGCTGTGTAACCCAATGGATATAACA
 CTGTACTATTATCAGCAGACCGATGAAGCAAACAAATGGATTTCAATGGGAAGCAGC
 TGTACCATCAAAGTTTGTCTCTCAACACCCAACTCTCGGCATAGGGTGTCTGACC
 ACAGACGCTACTACCTTTGAAGAAGTTGCGACCGCGGAAAAGCTGGTTATCACAGAT
 GTGGTAGATGGCGTTAACCACAAATTGGACGTAACCACAGCAACATGCACAATTAGG
 AACTGCAAGAAGCTAGGACCCAGGGAAAACGTAGCCGTCATCCAAGTGGGCGGCAGT
 GACATCCTAGACATCACCGCAGACCCAACAACAGCACCACAAACCGAGAGGATGATG
 CGCATTAAATTGGAAGAAATGGTGGCAGGTGTTTTTAACTGTCGTTGACTATGTGGAC
 CAGATCATTCAGGTGATGAGCAAGCGGAGTCGCTCATTGAATAGTGCTGCCTTTTAT
 TACAGAGTCTAA

D-2X35S/CPMV-HT/RVA(Rtx) VP7(Opt)/NOS (Construct number 1734)

Figure 44A (SEQ ID NO: 55)

IF-TrSP+Rtx_VP7(opt).s1+3c

AAATTTGTCGGGCCCATGGATTATATTATCTATCGTAGCCTCCTCATCTA

Figure 44B, (SEQ ID NO: 56)

IF-Rtx_VP7(opt).s1-4r

ACTAAAGAAAATAGGCCTCTAAACGCGATAATAGAAGGCTGCTGAGTTCAGGGA

Figure 44C, (SEQ ID NO: 57)

Optimized coding sequence of Rotavirus A VP7 from strain RVA/Vaccine/USA/Rotarix-A41CB052A/1988/G1P1A[8]

ATGTACGGCATCGAGTATACAACAATTTTAATTTTCCTGATTTCCATCATTCTGTTA
AACTACATCCTTAAGTCCGTGACCAGAATTATGGATTATATTATCTATCGTAGCCTC
CTCATCTACGTGGCCCTTTTTGCCCTGACCAGGGCCCAGAACTATGGCCTGAACCTA
CCAATCACCGGTTCAATGGATACCGTTTACGCTAATTCCACTCAAGAGGGGATATTT
CTGACAAGTACCCTGTGCCTGTATTATCCAACAGAAGCCTCTACCCAGATCAATGAT
GGGGAGTGGAAGGATAGTCTCTCACAGATGTTCCCTAACCAAGGGCTGGCCACCGGT
TCCGTCTACTTCAAGGAATACTCTAGTATTGTCGACTTCTCAGTTGACCCCCAGCTT
TATTGCGACTACAACCTGGTACTTATGAAATACGACCAGAACCTGGAGCTGGATATG
TCCGAGCTGGCTGACCTGATCCTCAATGAGTGGCTGTGCAACCCCATGGACATCACA
TTATATTACTACCAGCAGTCTGGAGAATCCAACAAGTGGATCAGTATGGGCTCAAGT
TGCACCGTGAAGGTGTGTCCCTTGAACACCCAAATGCTGGGCATTGGTTGTCAGACA
ACTAATGTGGATTTCGTTTGAATGGTAGCCGAAAACGAGAAGCTGGCTATAGTGGAC
GTAGTCGATGGGATTAACCACAAGATCAATCTGACTACCACCACTTGTACCATCAGA
AACTGTAAAAAGCTCGGCCCCCGGGAGAACGTCGCCGTGATCCAGGTGGGGGGGAGC
AATGTGCTCGACATTACTGCCGACCCTACCACCAATCCACAGACGGAACGGATGATG
AGAGTCAACTGGAAGAAATGGTGGCAGGTCTTTTATACCATTGTGGACTACATTAAC
CAGATTGTGCAAGTCATGAGTAAACGGTCCAGATCCCTGAACTCAGCAGCCTTCTAT
TATCGCGTTTAG

Figure 44D, (SEQ ID NO: 58)

Expression cassette number 1734 from 2X35S promoter to NOS terminator. VP7 from Rotavirus A vaccine USA/Rotarix-A41CB052A/1988/G1P1A[8] strain is underlined.

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTC
TCAGAAGACCAAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTC
CTCGGATTCCATTGCCAGCTATCTGTCACTTTATTGTGAAGATAGTGGAAGGAA
GGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCC
TCTGCCGACAGTGGTCCCAAGATGGACCCCCACCCACGAGGAGCATCGTTGGAAGAA
GAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAG
CACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGG
GCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGC
CCAGCTATCTGTCACTTTATTGTGAAGATAGTGGAAGGAAGGTGGCTCCTACAAA
TGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGT
CCCAAAGATGGACCCCCACCCACGAGGAGCATCGTTGGAAGAAAGAACGTTCCAACC
ACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCA
CAATCCCACTATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTTCATTTG
GAGAGGTATTAAATCTTAATAGGTTTTGATAAAGCGAACGTGGGGAAACCCGAAC
CAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAGCAAACCTTCTCTTGTCTT
TCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACAACGTT

TTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAGTGCGGGCGCCATT
AAATAACGTGTACTTGTCTTATTCTTGTGCGGTGTGGTCTTGGGAAAAGAAAGCTTGC
TGGAGGCTGCTGTTTACGCCCCATACATTACTTGTACGATTCTGCTGACTTTCGGCG
GGTGCAATATCTCTACTTCTGCTTGACGAGGTATTGTTGCCTGTACTTCTTTCTTCT
TCTTCTTGCTGATTGGTCTATAAGAAATCTAGTATTTTCTTTGAAACAGAGTTTTTC
CCGTGGTTTTTCGAACTTGGAGAAAAGATTGTTAAGCTTCTGTATATTCTGCCCCAATT
TGTCGGGCCCCATGGATTATATTATCTATCGTAGCCTCCTCATCTACGTGGCCCTTTT
TGCCCTGACCAGGGCCCAGAACTATGGCCTGAACTTACCAATCACCGGTTCAATGGA
TACCGTTTTACGCTAATTCCACTCAAGAGGGGATATTTCTGACAAGTACCCTGTGCCT
GTATTATCCAACAGAAGCCTCTACCCAGATCAATGATGGGGAGTGGAAGGATAGTCT
CTCACAGATGTTTCTAACCAAGGGCTGGCCCACCGGTTCCGTCTACTTCAAGGAATA
CTCTAGTATTGTGCACTTCTCAGTTGACCCCCAGCTTTATTGCGACTACAACCTGGT
ACTTATGAAATACGACCAGAACCTGGAGCTGGATATGTCCGAGCTGGCTGACCTGAT
CCTCAATGAGTGGCTGTGCAACCCCATGGACATCACATTATATTACTACCAGCAGTC
TGGAGAATCCAACAAGTGGATCAGTATGGGCTCAAGTTGCACCGTGAAGGTGTGTCC
CTTGAACACCCAAATGCTGGGCATTGGTTGTCAGACAACATAATGTGGATTTCGTTTGA
AATGGTAGCCGAAAACGAGAAGCTGGCTATAGTGGACGTAGTCGATGGGATTAACCA
CAAGATCAATCTGACTACCACCCTTGTACCATCAGAACTGTAAAAAGCTCGGCCC
CCGGGAGAACGTCGCCGTGATCCAGGTGGGGGGGAGCAATGTGCTCGACATTACTGC
CGACCCTACCACCAATCCACAGACGGAACGGATGATGAGAGTCAACTGGAAGAAATG
GTGGCAGGTCTTTTATACCATTGTGGACTACATTAACCAGATTGTGCAAGTCATGAG
TAAACGGTCCAGATCCCTGAACTCAGCAGCCTTCTATTATCGCGTTTAGAGGCCTAT
TTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGT
TTTCTGTGCTCAGAGTGTGTTTATTTTATGTAATTTAATTTCTTTGTGAGCTCCTGT
TTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTATTAAAAAAAA
AAAAAAAAGACCGGAATTTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAAC
ATTTGGCAATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATTATC
ATATAATTTCTGTTGAATTACGTTAAGCATGTAATAATTAACATGTAATGCATGACG
TTATTTATGAGATGGGTTTTTATGATTAGAGTCCCGCAATTATACATTTAATACGCG
ATAGAAAACAAAATATAGCGCGCAAACTAGGATAAATTATCGCGCGCGGTGTCTATCT
ATGTTACTAGAT

Figure 44E, SEQ ID NO: 59

Amino acid sequence of TrSp-VP7 from Rotavirus A vaccine
USA/Rotarix-A41CB052A/1988/G1P1A[8] strain

MDYIIYRSLLIYVALFALTRAQNYGLNLPITGSMDTVYANSTQEGIFLTSTLCLYYP
TEASTQINDGEWKDSLSQMFLTKGWPTGSVYFKEYSSIVDFSVDLPQLYCDYNLVLK
YDQNLELDMSELADLILNEWLCNPMDITLYYYQQSGESNKWISMGSSCTVKVCPLNT
QMLGIGCQTTNVDSFEMVAENEKLAIVDVVDGINHKINLTTTCTIRNCKKLGPEN
VAVIQVGGSNVLDITADPTTNPQTERMMRVNWKKWWQVFYTIVDYINQIVQVMSKRS
RSLNSAAFYYRV

Figure 44F

Schematic representation of construct number 1734

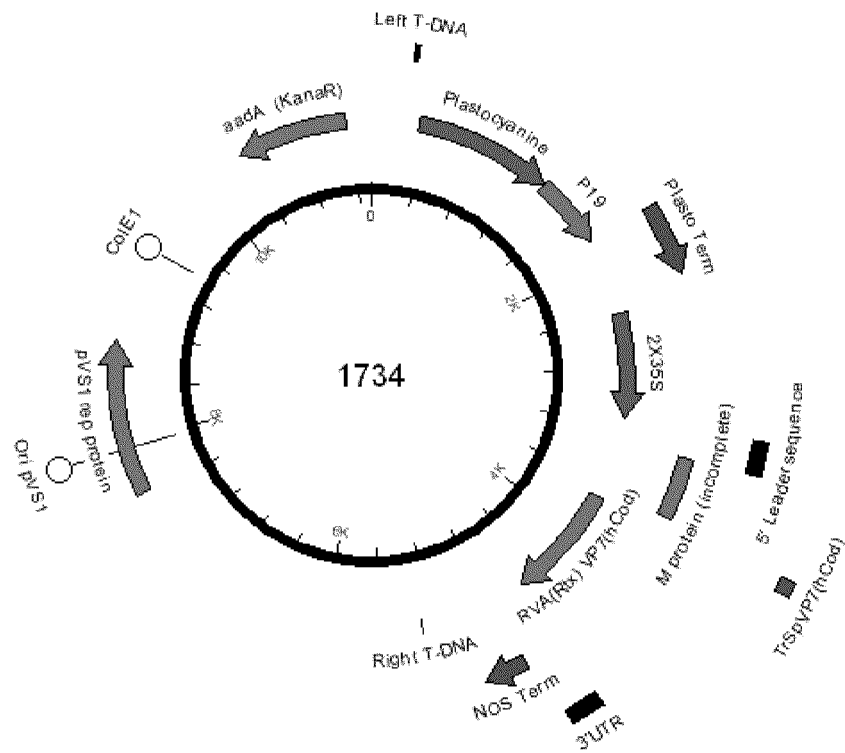


Figure 45

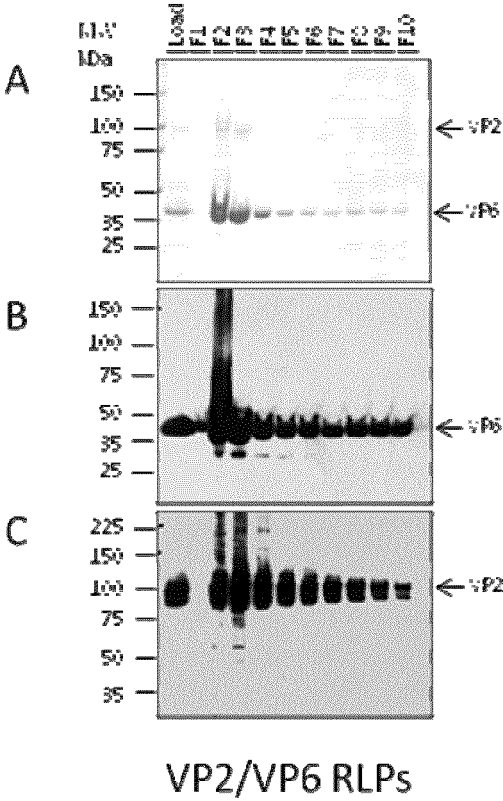


Figure 46

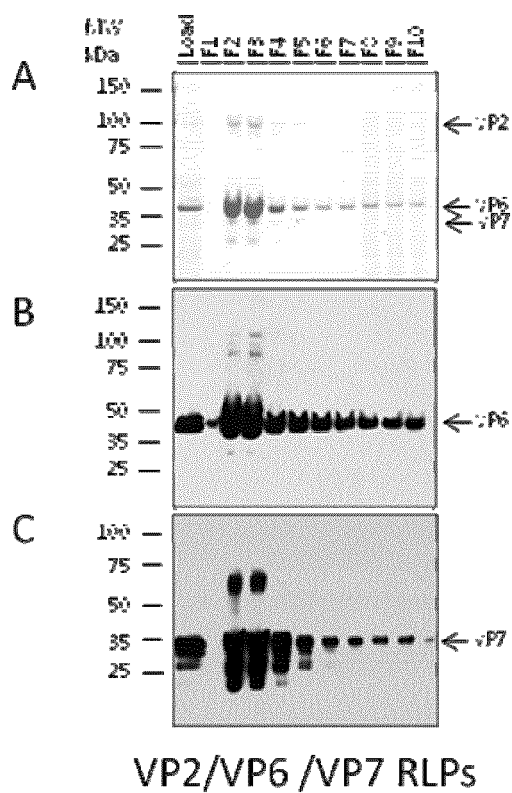


Figure 47

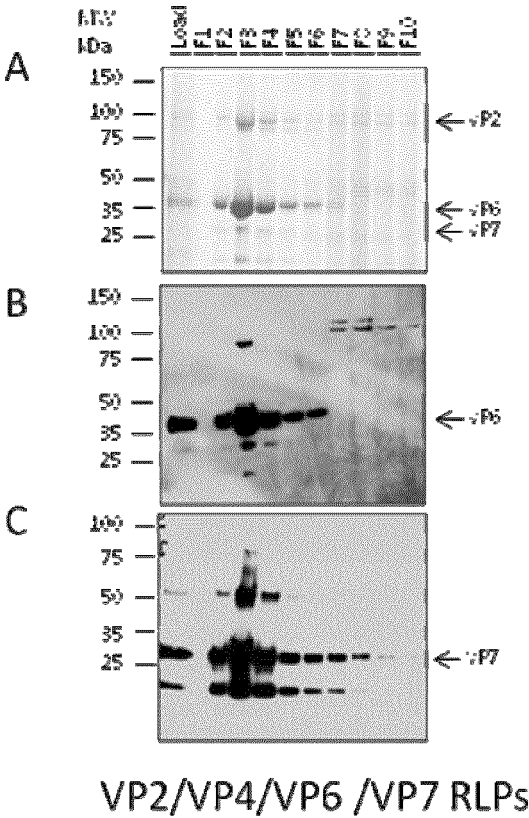


Figure 48

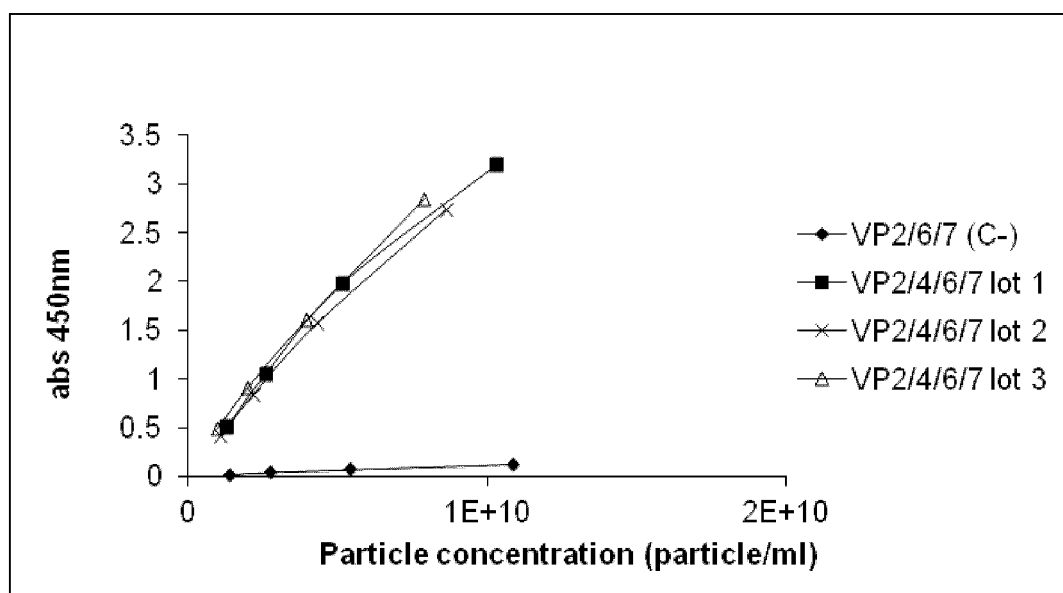


Figure 49

