A-2X35S/CPMV-HT/H5 Indonesia/NOS (Construct number 489)

Figure 1A

IF-H5A-I-05.s1+3c SEQ ID NO: 2

AAATTTGTCGGGCCCATGGAGAAAATAGTGCTTCTTCTTGC

Figure 1B

IF-H5dTm.r SEQ ID NO: 3

ACTAAAGAAAATAGGCCTTTAAATGCAAATTCTGCATTGTAACGATCCAT

Figure 1C

Schematic representation of construct 1191. SacII and StuI restriction enzyme sites used for plasmid linearization are annotated on the representation.

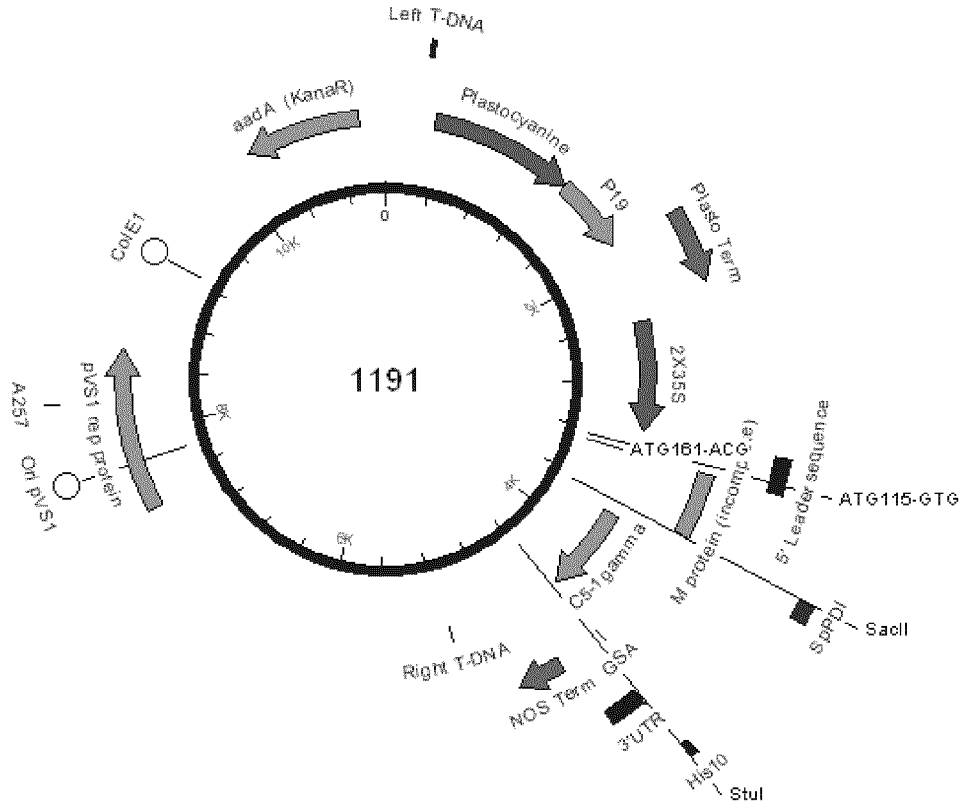


Figure 1D

Construct 1191 from left to right t-DNA borders (underlined). 2X35S/CPMV-HT/NOS with Plastocyanine-P19-Plastocyanine silencing inhibitor expression cassette (SEQ ID NO: 4)

TGGCAGGATATATTGTGGTGTAAACAAATTGACGCTTAGACAACTTAATAACACATTGCGGACGTTTTTA
ATGTACTGAATTAACGCCGAATCCCGGGCTGGTATATTTATATGTTGTCAAATAACTCAAAAACCATAAA
AGTTTAAGTTAGCAAGTGTGTACATTTTTACTTGAACAAAAATATTCACCTACTACTGTTATAAATCATTA
TTAAACATTAGAGTAAAGAAATATGGATGATAAGAACAAGAGTAGTGATATTTTGACAACAATTTTGTTG
CAACATTTGAGAAAATTTTGTTGTTCTCTCTTTTCATTGGTCAAAAACAATAGAGAGAGAAAAAGGAAGA
GGGAGAATAAAAACATAATGTGAGTATGAGAGAGAAAGTTGTACAAAAGTTGTACCAAAATAGTTGTAC
AAATATCATTGAGGAATTTGACAAAAGCTACACAAATAAGGGTTAATTGCTGTAAATAAATAAGGATGA
CGCATTAGAGAGATGTACCATTAGAGAATTTTTGGCAAGTCATTAAAAAGAAAGAATAAATTATTTTTAA
AATTAAAAGTTGAGTCATTTGATTAAACATGTGATTATTTAATGAATTGATGAAAGAGTTGGATTAAAGT
TGTATTAGTAATTAGAATTTGGTGTCAAATTTAATTTGACATTTGATCTTTTCCTATATATTGCCCCATAGA
GTCAGTTAACTCATTTTTATATTTCATAGATCAAATAAGAGAAATAACGGTATATTAATCCCTCCAAAAA
AAAAAAACGGTATATTTACTAAAAAATCTAAGCCACGTAGGAGGATAACAGGATCCCCGTAGGAGGATA
ACATCCAATCCAACCAATCACAACAATCCTGATGAGATAACCCACTTTAAGCCCACGCATCTGTGGCACA
TCTACATTATCTAAATCACACATTCTTCCACACATCTGAGCCACACAAAAACCAATCCACATCTTTATCAC
CCATTCTATAAAAAATCACACTTTGTGAGTCTACACTTTGATTCCCTTCAAACACATACAAAGAGAAGAG
ACTAATTAATTAATTAATCATCTTGAGAGAAAATGGAACGAGCTATACAAGGAAACGACGCTAGGGAAC
AAGCTAACAGTGAACGTTGGGATGGAGGATCAGGAGGTACCACTTCTCCCTTCAAACTTCCTGACGAAAG
TCCGAGTTGGACTGAGTGGCGGCTACATAACGATGAGACGAATTCGAATCAAGATAATCCCCTTGGTTTC
AAGGAAAGCTGGGGTTTCGGGAAAGTTGTATTTAAGAGATATCTCAGATACGACAGGACGGAAGCTTCA
CTGCACAGAGTCCTTGGATCTTGGACGGGAGATTCGGTTAACTATGCAGCATCTCGATTTTTCGGTTTCGA
CCAGATCGGATGTACCTATAGTATTCGGTTTCGAGGAGTTAGTATCACCGTTTCTGGAGGGTCGCGAACT
CTTCAGCATCTCTGTGAGATGGCAATTCGGTCTAAGCAAGAACTGCTACAGCTTGCCCCAATCGAAGTGG
AAAGTAATGTATCAAGAGGATGCCCTGAAGGTACTCAAACCTTCGAAAAAGAAAGCGAGTAAGTTAAAA
TGCTTCTTCGTCTCCTATTTATAATATGGTTTGTTATTGTTAATTTTGTTCTTGTAGAAGAGCTTAATTAAT
CGTTGTTGTTATGAAATACTATTTGTATGAGATGAACTGGTGTAATGTAATTCATTTACATAAGTGGAGTC
AGAATCAGAATGTTTCCTCCATAACTAACTAGACATGAAGACCTGCCGCGTACAATTGTCTTATATTTGA
ACAACTAAAATTGAACATCTTTTGCCACAACTTTATAAGTGGTTAATATAGCTCAAATATATGGTCAAGTT
CAATAGATTAATAATGGAAATATCAGTTATCGAAATTCATTAACAATCAACTTAACGTTATTAACTACTA
ATTTTATATCATCCCCTTTGATAAATGATAGTACACCAATTAGGAAGGAGCATGCTCGCCTAGGAGATTG
TCGTTTCCCGCCTTCAGTTTGCAAGCTGCTCTAGCCGTGTAGCCAATACGCAAACCGCCTCTCCCCGCGCG
TTGGGAATTACTAGCGCGTGTCGACAAGCTTGCATGCCGGTCAACATGGTGGAGCACGACACACTTGTCT
ACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCAACAAAGGGTAA
TATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATAGTGGAAAAGGA
AGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGT
GGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCA
AAGCAAGTGGATTGATGTGATAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGAT
ACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGA
TTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCC
ATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCC
CACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTG
ATATCTCCACTGACGTAAGGGATGACGCACAATCCCACTATCCTTCGCAAGACCCTTCCTCTATATAAGG
AAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGGTTTTGATAAAAGCGAACGTGGGGAAACCCG
AACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAGCAAACTTCTCTCTTGTCTTTCTTGCGTGAGC
GATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACAACGTTTTCTTTCACTGAAGCGAAATCAAAG
ATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACGTGTACTTGTCCTATTCTTGTCGGTGTGGTCT
TGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCATACATTACTTGTTACGATTCTGCTGACTTTC
GGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTGTTGCCTGTACTTCTTTCTTCTTCTTCTTGCTG

ATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGAGTTTTCCCGTGGTTTTCGAACTTGGAGAAAG
ATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGCCCGCGGATGGCGAAAAACGTTGCGATTTTCG
GCTTATTGTTTTCTCTTCTTGTGTTGGTTCCTTCTCAGATCTTCGCCTGCAGGCTCCTCAGCCAAAACGACA
CCCCCATCTGTCTATCCACTGGCCCCTGGATCTGCTGCCCAAACTAACTCCATGGTGACCCTGGGATGCCT
GGTCAAGGGCTATTTCCCTGAGCCAGTGACAGTGACCTGGAACTCTGGATCCCTGTCCAGCGGTGTGCAC
ACCTTCCCAGCTGTCCTGCAGTCTGACCTCTACACTCTGAGCAGCTCAGTGACTGTCCCCTCCAGCACCTG
GCCCAGCGAGACCGTCACCTGCAACGTTGCCCACCCGGCCAGCAGCACCAAGGTGGACAAGAAAATTGT
GCCCAGGGATTGTGGTTGTAAGCCTTGCATATGTACAGTCCCAGAAGTATCATCTGTCTTCATCTTCCCCC
CAAAGCCCAAGGATGTGCTCACCATTACTCTGACTCCTAAGGTCACGTGTGTTGTGGTAGACATCAGCAA
GGATGATCCCGAGGTCCAGTTCAGCTGGTTTGTAGATGATGTGGAGGTGCACACAGCTCAGACGCAACCC
CGGGAGGAGCAGTTCAACAGCACTTTCCGCTCAGTCAGTGAACTTCCCATCATGCACCAGGACTGGCTCA
ATGGCAAGGAGCGATCGCTCACCATCACCATCACCATCACCATCACCATTAAAGGCCTATTTTCTTTAGTT
TGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTT
TATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATTTT
AATTTTATTAAAAAAAAAAAAAAAAAAAGACCGGGAATTCGATATCAAGCTTATCGACCTGCAGATCGTT
CAAACATTTGGCAATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATTATCATATAATTT
CTGTTGAATTACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTAT
GATTAGAGTCCCGCAATTATACATTTAATACGCGATAGAAAACAAAATATAGCGCGCAAACTAGGATAA
ATTATCGCGCGCGGTGTCATCTATGTTACTAGATCTCTAGAGTCTCAAGCTTGGCGCGCCCACGTGACTAG
TGGCACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACCCTGGCGTTACCCAACTTAATCGCCTTGC
AGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTG
CGCAGCCTGAATGGCGAATGCTAGAGCAGCTTGAGCTTGGATCAGATTGTCGTTTCCCGCCTTCAGTTTA
AACTATCAGTGTTTGACAGGATATATTGGCGGGTAAACCTAAGAGAAAAGAGCGTTTA

Figure 1E

Expression cassette number 489 from 2X35S promoter to NOS terminator. H5 from influenza A/Indonesia/5/2005 (H5N1) is underlined. SEQ ID NO: 5

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAA
AGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCT
GTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAA
AGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCG
TGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACG
ACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCA
ACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATA
GTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCC
TCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCA
ACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCACAATCCCACT
ATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGG
TTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAG
CAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACA
ACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACG
TGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCA
TACATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTG
TTGCCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGA
GTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGC
CCATGGAGAAAATAGTGCTTCTTCTTGCAATAGTCAGTCTTGTTAAAAGTGATCAGATTTGCATTGGTTAC
CATGCAAACAATTCAACAGAGCAGGTTGACACAATCATGGAAAAGAACGTTACTGTTACACATGCCCAA
GACATACTGGAAAAGACACACAACGGGAAGCTCTGCGATCTAGATGGAGTGAAGCCTCTAATTTTAAGA
GATTGTAGTGTAGCTGGATGGCTCCTCGGGAACCCAATGTGTGACGAATTCATCAATGTACCGGAATGGT
CTTACATAGTGGAGAAGGCCAATCCAACCAATGACCTCTGTTACCCAGGGAGTTTCAACGACTATGAAGA

ACTGAAACACCTATTGAGCAGAATAAACCATTTTGAGAAAATTCAAATCATCCCCAAAAGTTCTTGGTCC
GATCATGAAGCCTCATCAGGAGTTAGCTCAGCATGTCCATACCTGGGAAGTCCCTCCTTTTTTAGAAATGT
GGTATGGCTTATCAAAAAGAACAGTACATACCCAACAATAAAGAAAAGCTACAATAATACCAACCAAGA
GGATCTTTTGGTACTGTGGGGAATTCACCATCCTAATGATGCGGCAGAGCAGACAAGGCTATATCAAAAC
CCAACCACCTATATTTCCATTGGGACATCAACACTAAACCAGAGATTGGTACCAAAAATAGCTACTAGAT
CCAAAGTAAACGGGCAAAGTGGAAGGATGGAGTTCTTCTGGACAATTTTAAAACCTAATGATGCAATCA
ACTTCGAGAGTAATGGAAATTTCATTGCTCCAGAATATGCATACAAAATTGTCAAGAAAGGGGACTCAGC
AATTATGAAAAGTGAATTGGAATATGGTAACTGCAACACCAAGTGTCAAACTCCAATGGGGGCGATAAA
CTCTAGTATGCCATTCCACAACATACACCCTCTCACCATCGGGGAATGCCCCAAATATGTGAAATCAAAC
AGATTAGTCCTTGCAACAGGGCTCAGAAATAGCCCTCAAAGAGAGAGCAGAAGAAAAAAGAGAGGACT
ATTTGGAGCTATAGCAGGTTTTATAGAGGGAGGATGGCAGGGAATGGTAGATGGTTGGTATGGGTACCA
CCATAGCAATGAGCAGGGGAGTGGGTACGCTGCAGACAAAGAATCCACTCAAAAGGCAATAGATGGAGT
CACCAATAAGGTCAACTCAATCATTGACAAAATGAACACTCAGTTTGAGGCCGTTGGAAGGGAATTTAAT
AACTTAGAAAGGAGAATAGAGAATTTAAACAAGAAGATGGAAGACGGGTTTCTAGATGTCTGGACTTAT
AATGCCGAACTTCTGGTTCTCATGGAAAATGAGAGAACTCTAGACTTTCATGACTCAAATGTTAAGAACC
TCTACGACAAGGTCCGACTACAGCTTAGGGATAATGCAAAGGAGCTGGGTAACGGTTGTTTCGAGTTCTA
TCACAAATGTGATAATGAATGTATGGAAAGTATAAGAAACGGAACGTACAACTATCCGCAGTATTCAGA
AGAAGCAAGATTAAAAAGAGAGGAAATAAGTGGGGTAAAATTGGAATCAATAGGAACTTACCAAATAC
TGTCAATTTATTCAACAGTGGCGAGTTCCCTAGCACTGGCAATCATGATGGCTGGTCTATCTTTATGGATG
TGCTCCAATGGATCGTTACAATGCAGAATTTGCATTTAAAGGCCTATTTTCTTTAGTTTGAATTTACTGTT
ATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTTATGTAATTTAAT
TTCTTTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTATTAAAA
AAAAAAAAAAAAAAGACCGGGAATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCA
ATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATTATCATATAATTTCTGTTGAATTACG
TTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTATGATTAGAGTCCCG
CAATTATACATTTAATACGCGATAGAAAACAAAATATAGCGCGCAAACTAGGATAAATTATCGCGCGCG
GTGTCATCTATGTTACTAGAT

Figure 1F

Amino acid sequence of H5 from influenza A/Indonesia/5/2005 (H5N1) SEQ ID NO: 6

MEKIVLLLAIVSLVKSDQICIGYHANNSTEQVDTIMEKNVTVTHAQDILEKTHNGKLCDL
DGVKPLILRDCSVAGWLLGNPMCDEFINVPEWSYIVEKANPTNDLCYPGSFNDYEELKH
LLSRINHFEKIQIIPKSSWSDHEASSGVSSACPYLGSPSFFRNVVWLIKKNSTYPTIKKSYN
NTNQEDLLVLWGIHHPNDAAEQTRLYQNPTTYISIGTSTLNQRLVPKIATRSKVNGQSGR
MEFFWTILKPNDAINFESNGNFIAPEYAYKIVKKGDSAIMKSELEYGNCNTKCQTPMGAI
NSSMPFHNIHPLTIGECPKYVKSNRLVLATGLRNSPQRESRRKKRGLFGAIAGFIEGGWQ
GMVDGWYGYHHSNEQGSGYAADKESTQKAIDGVTNKVNSIIDKMNTQFEAVGREFNN
LERRIENLNKKMEDGFLDVWTYNAELLVLMENERTLDFHDSNVKNLYDKVRLQLRDN
AKELGNGCFEFYHKCDNECMESIRNGTYNYPQYSEEARLKREEISGVKLESIGTYQILSIY
STVASSLALAIMMAGLSLWMCSNGSLQCRICI

Figure 1G nucleotide sequence encoding H5 from influenza A/Indonesia/5/2005 (H5N1) SEQ ID NO: 42)

ATGGAGAAAATAGTGCTTCTTCTTGCAATAGTCAGTCTTGTTAAAAGTGATCAGATTTGCATTGGTTACCA
TGCAAACAATTCAACAGAGCAGGTTGACACAATCATGGAAAAGAACGTTACTGTTACACATGCCCAAGA
CATACTGGAAAAGACACACAACGGGAAGCTCTGCGATCTAGATGGAGTGAAGCCTCTAATTTTAAGAGA
TTGTAGTGTAGCTGGATGGCTCCTCGGGAACCCAATGTGTGACGAATTCATCAATGTACCGGAATGGTCT
TACATAGTGGAGAAGGCCAATCCAACCAATGACCTCTGTTACCCAGGGAGTTTCAACGACTATGAAGAA
CTGAAACACCTATTGAGCAGAATAAACCATTTTGAGAAAATTCAAATCATCCCCAAAAGTTCTTGGTCCG
ATCATGAAGCCTCATCAGGAGTTAGCTCAGCATGTCCATACCTGGGAAGTCCCTCCTTTTTTAGAAATGTG
GTATGGCTTATCAAAAAGAACAGTACATACCCAACAATAAAGAAAAGCTACAATAATACCAACCAAGAG
GATCTTTTGGTACTGTGGGGAATTCACCATCCTAATGATGCGGCAGAGCAGACAAGGCTATATCAAAACC
CAACCACCTATATTTCCATTGGGACATCAACACTAAACCAGAGATTGGTACCAAAAATAGCTACTAGATC
CAAAGTAAACGGGCAAAGTGGAAGGATGGAGTTCTTCTGGACAATTTTAAAACCTAATGATGCAATCAA
CTTCGAGAGTAATGGAAATTTCATTGCTCCAGAATATGCATACAAAATTGTCAAGAAAGGGGACTCAGCA
ATTATGAAAAGTGAATTGGAATATGGTAACTGCAACACCAAGTGTCAAACTCCAATGGGGGCGATAAAC
TCTAGTATGCCATTCCACAACATACACCCTCTCACCATCGGGGAATGCCCCAAATATGTGAAATCAAACA
GATTAGTCCTTGCAACAGGGCTCAGAAATAGCCCTCAAAGAGAGAGCAGAAGAAAAAAGAGAGGACTA
TTTGGAGCTATAGCAGGTTTTATAGAGGGAGGATGGCAGGGAATGGTAGATGGTTGGTATGGGTACCAC
CATAGCAATGAGCAGGGGAGTGGGTACGCTGCAGACAAAGAATCCACTCAAAAGGCAATAGATGGAGTC
ACCAATAAGGTCAACTCAATCATTGACAAAATGAACACTCAGTTTGAGGCCGTTGGAAGGGAATTTAATA
ACTTAGAAAGGAGAATAGAGAATTTAAACAAGAAGATGGAAGACGGGTTTCTAGATGTCTGGACTTATA
ATGCCGAACTTCTGGTTCTCATGGAAAATGAGAGAACTCTAGACTTTCATGACTCAAATGTTAAGAACCT
CTACGACAAGGTCCGACTACAGCTTAGGGATAATGCAAAGGAGCTGGGTAACGGTTGTTTCGAGTTCTAT
CACAAATGTGATAATGAATGTATGGAAAGTATAAGAAACGGAACGTACAACTATCCGCAGTATTCAGAA
GAAGCAAGATTAAAAAGAGAGGAAATAAGTGGGGTAAAATTGGAATCAATAGGAACTTACCAAATACT
GTCAATTTATTCAACAGTGGCGAGTTCCCTAGCACTGGCAATCATGATGGCTGGTCTATCTTTATGGATGT
GCTCCAATGGATCGTTACAATGCAGAATTTGCATTTAA

B-2X35S/CPMV HT/M2 New Caledonia/NOS (Construct number 1261)

Figure 2A

IF-S1-M1+M2ANC.c (SEQ ID NO:7)

AAATTTGTCGGGCCCATGAGTCTTCTAACCGAGGTCGAAACG

Figure 2B

IF-S1-4-M2ANC.r (SEQ ID NO: 8)

ACTAAAGAAAATAGGCCTTTACTCCAGCTCTATGCTGACAAAA

Figure 2C

Synthesized M2 gene (corresponding to nt 1-26 joined to 715-982 from Genbank accession number DQ508860) (SEQ ID NO: 9)

ATGAGTCTTCTAACCGAGGTCGAAACGCCTATCAGAAACGAATGGGGGTGCAGATGCAACGATTCAAGT
GATCCTCTTGTTGTTGCCGCAAGTATAATTGGGATTGTGCACCTGATATTGTGGATTATTGATCGCCTTTTT
TCCAAAAGCATTTATCGTATCTTTAAACACGGTTTAAAAAGAGGGCCTTCTACGGAAGGAGTACCAGAGT
CTATGAGGGAAGAATATCGAGAGGAACAGCAGAATGCTGTGGATGCTGACGATGGTCATTTTGTCAGCA
TAGAGCTGGAGTAA

Figure 2D

Expression cassette number 1261 from 2X35S promoter to NOS terminator. M2 from influenza A/New Caledonia/20/1999 (H1N1) is underlined. (SEQ ID NO: 10)

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAA
AGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCT
GTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAA
AGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCG
TGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACG
ACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCA
ACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATA
GTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCC
TCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCA
ACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCACAATCCCACT
ATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGG
TTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAG
CAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACA
ACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACG
TGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCA

TACATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTG
TTGCCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGA
GTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGC
CCATGAGTCTTCTAACCGAGGTCGAAACGCCTATCAGAAACGAATGGGGGTGCAGATGCAACGATTCAA
GTGATCCTCTTGTTGTTGCCGCAAGTATAATTGGGATTGTGCACCTGATATTGTGGATTATTGATCGCCTT
TTTTCCAAAAGCATTTATCGTATCTTTAAACACGGTTTAAAAAGAGGGCCTTCTACGGAAGGAGTACCAG
AGTCTATGAGGGAAGAATATCGAGAGGAACAGCAGAATGCTGTGGATGCTGACGATGGTCATTTTGTCA
GCATAGAGCTGGAGTAAAGGCCTATTTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTT
GGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTTATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGC
AGGTCGTCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTATTAAAAAAAAAAAAAAAAAAGACCGGG
AATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCAATAAAGTTTCTTAAGATTGAATC
CTGTTGCCGGTCTTGCGATGATTATCATATAATTTCTGTTGAATTACGTTAAGCATGTAATAATTAACATG
TAATGCATGACGTTATTTATGAGATGGGTTTTTATGATTAGAGTCCCGCAATTATACATTTAATACGCGAT
AGAAAACAAAATATAGCGCGCAAACTAGGATAAATTATCGCGCGCGGTGTCATCTATGTTACTAGAT

Figure 2E

Amino acid sequence of M2 from influenza A/New Caledonia/20/1999 (H1N1) (SEQ ID NO: 11)

MSLLTEVETPIRNEWGCRCNDSSDPLVVAASIIGIVHLILWIIDRLFSKSIYRIFKHGLKRGP
STEGVPESMREEYREEQQNAVDADDGHFVSIELE

C-2X35S/CPMV-HT/M2 Puerto Rico/NOS (Construct number 859)

Figure 3A

Synthesized M2 gene (corresponding to nt 26-51 joined to nt 740-1007 from Genebank accession number EF467824) (SEQ ID NO: 12)

ATGAGTCTTCTAACCGAGGTCGAAACGCCTATCAGAAACGAATGGGGGTGCAGATGCAACGGTTCAAGT
GATCCTCTCACTATTGCCGCAAATATCATTGGGATCTTGCACTTGACATTGTGGATTCTTGATCGTCTTTTT
TTCAAATGCATTTACCGTCGCTTTAAATACGGACTGAAAGGAGGGCCTTCTACGGAAGGAGTGCCAAAGT
CTATGAGGGAAGAATATCGAAAGGAACAGCAGAGTGCTGTGGATGCTGACGATGGTCATTTTGTCAGCA
TAGAGCTGGAGTAA

Figure 3B

Expression cassette number 859 from 2X35S promoter to NOS terminator. M2 from Influenza A/Puerto Rico/8/1934 (H1N1) is underlined. (SEQ ID NO: 13)

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAA
AGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCT
GTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAA
AGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCG
TGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACG
ACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCA
ACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATA
GTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCC
TCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCA
ACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCACAATCCCACT
ATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGG
TTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAG
CAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACA
ACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACG
TGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCA
TACATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTG
TTGCCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGA
GTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGC
CCATGAGTCTTCTAACCGAGGTCGAAACGCCTATCAGAAACGAATGGGGGTGCAGATGCAACGGTTCAA
GTGATCCTCTCACTATTGCCGCAAATATCATTGGGATCTTGCACTTGACATTGTGGATTCTTGATCGTCTTT
TTTTCAAATGCATTTACCGTCGCTTTAAATACGGACTGAAAGGAGGGCCTTCTACGGAAGGAGTGCCAAA
GTCTATGAGGGAAGAATATCGAAAGGAACAGCAGAGTGCTGTGGATGCTGACGATGGTCATTTTGTCAG
CATAGAGCTGGAGTAAAGGCCTATTTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTG
GTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTTATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCA
GGTCGTCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTATTAAAAAAAAAAAAAAAAAAGACCGGGA
ATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCAATAAAGTTTCTTAAGATTGAATCC
TGTTGCCGGTCTTGCGATGATTATCATATAATTTCTGTTGAATTACGTTAAGCATGTAATAATTAACATGT
AATGCATGACGTTATTTATGAGATGGGTTTTTATGATTAGAGTCCCGCAATTATACATTTAATACGCGATA
GAAAACAAAATATAGCGCGCAAACTAGGATAAATTATCGCGCGCGGTGTCATCTATGTTACTAGAT

Figure 3C

Amino acid sequence of M2 from influenza A/Puerto Rico/8/1934 (H1N1) (SEQ ID NO:14)

MSLLTEVETPIRNEWGCRCNGSSDPLTIAANIIGILHLTLWILDRLFFKCIYRRFKYGLKGG
PSTEGVPKSMREEYRKEQQSAVDADDGHFVSIELE

D-2X35S/CPMV-HT/PDISP/H1 California/NOS (Construct number 484)

Figure 4A

IF-H1A-C-09.s2+4c (SEQ ID NO: 15)

TCTCAGATCTTCGCCGACACATTATGTATAGGTTATCATGCGAACA

Figure 4B

IF-H1A-C-09.s1-4r (SEQ ID NO: 16)

ACTAAAGAAAATAGGCCTTTAAATACATATTCTACACTGTAGAGACCCA

Figure 4C

Synthesized H1 gene (Genbank accession number FJ966974) (SEQ ID NO: 17)

ATGAAGGCAATACTAGTAGTTCTGCTATATACATTTGCAACCGCAAATGCAGACACATTATGTATAGGTT
ATCATGCGAACAATTCAACAGACACTGTAGACACAGTACTAGAAAAGAATGTAACAGTAACACACTCTG
TTAACCTTCTAGAAGACAAGCATAACGGGAAACTATGCAAACTAAGAGGGGTAGCCCCATTGCATTTGG
GTAAATGTAACATTGCTGGCTGGATCCTGGGAAATCCAGAGTGTGAATCACTCTCCACAGCAAGCTCATG
GTCCTACATTGTGGAAACACCTAGTTCAGACAATGGAACGTGTTACCCAGGAGATTTCATCGATTATGAG
GAGCTAAGAGAGCAATTGAGCTCAGTGTCATCATTTGAAAGGTTTGAGATATTCCCCAAGACAAGTTCAT
GGCCCAATCATGACTCGAACAAAGGTGTAACGGCAGCATGTCCTCATGCTGGAGCAAAAAGCTTCTACA
AAAATTTAATATGGCTAGTTAAAAAAGGAAATTCATACCCAAAGCTCAGCAAATCCTACATTAATGATAA
AGGGAAAGAAGTCCTCGTGCTATGGGGCATTCACCATCCATCTACTAGTGCTGACCAACAAAGTCTCTAT
CAGAATGCAGATGCATATGTTTTTGTGGGGTCATCAAGATACAGCAAGAAGTTCAAGCCGGAAATAGCA
ATAAGACCCAAAGTGAGGGATCAAGAAGGGAGAATGAACTATTACTGGACACTAGTAGAGCCGGGAGA
CAAAATAACATTCGAAGCAACTGGAAATCTAGTGGTACCGAGATATGCATTCGCAATGGAAAGAAATGC
TGGATCTGGTATTATCATTTCAGATACACCAGTCCACGATTGCAATACAACTTGTCAAACACCCAAGGGT
GCTATAAACACCAGCCTCCCATTTCAGAATATACATCCGATCACAATTGGAAAATGTCCAAAATATGTAA
AAAGCACAAAATTGAGACTGGCCACAGGATTGAGGAATATCCCGTCTATTCAATCTAGAGGCCTATTTGG
GGCCATTGCCGGTTTCATTGAAGGGGGGTGGACAGGGATGGTAGATGGATGGTACGGTTATCACCATCA
AAATGAGCAGGGGTCAGGATATGCAGCCGACCTGAAGAGCACACAGAATGCCATTGACGAGATTACTAA
CAAAGTAAATTCTGTTATTGAAAAGATGAATACACAGTTCACAGCAGTAGGTAAAGAGTTCAACCACCTG
GAAAAAAGAATAGAGAATTTAAATAAAAAAGTTGATGATGGTTTCCTGGACATTTGGACTTACAATGCC
GAACTGTTGGTTCTATTGGAAAATGAAAGAACTTTGGACTACCACGATTCAAATGTGAAGAACTTATATG
AAAAGGTAAGAAGCCAGCTAAAAAACAATGCCAAGGAAATTGGAAACGGCTGCTTTGAATTTTACCACA
AATGCGATAACACGTGCATGGAAAGTGTCAAAAATGGGACTTATGACTACCCAAAATACTCAGAGGAAG
CAAAATTAAACAGAGAAGAAATAGATGGGGTAAAGCTGGAATCAACAAGGATTTACCAGATTTTGGCGA
TCTATTCAACTGTCGCCAGTTCATTGGTACTGGTAGTCTCCCTGGGGGCAATCAGTTTCTGGATGTGCTCT
AATGGGTCTCTACAGTGTAGAATATGTATTTAA

Figure 4D

Schematic representation of construct 1192. SacII and StuI restriction enzyme sites used for plasmid linearization are annotated on the representation.

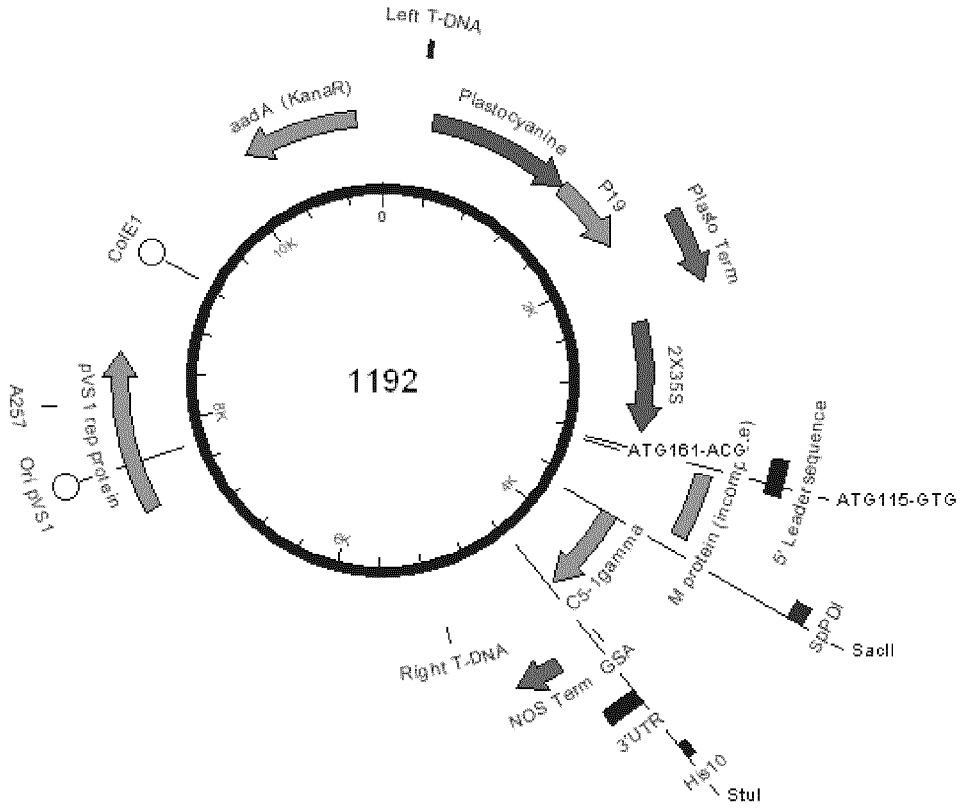


Figure 4E

Construct 1192 from left to right t-DNA borders (underlined). 2X35S/CPMV-HT/PDISP/NOS with Plastocyanine-P19-Plastocyanine silencing inhibitor expression cassette (SEQ ID NO: 18)

TGGCAGGATATATTGTGGTGTAAACAAATTGACGCTTAGACAACTTAATAACACATTGCGGACGTTTTTA
ATGTACTGAATTAACGCCGAATCCCGGGCTGGTATATTTATATGTTGTCAAATAACTCAAAAACCATAAA
AGTTTAAGTTAGCAAGTGTGTACATTTTTACTTGAACAAAAATATTCACCTACTACTGTTATAAATCATTA
TTAAACATTAGAGTAAAGAAATATGGATGATAAGAACAAGAGTAGTGATATTTTGACAACAATTTTGTTG
CAACATTTGAGAAAATTTTGTTGTTCTCTCTTTTCATTGGTCAAAAACAATAGAGAGAGAAAAAGGAAGA
GGGAGAATAAAAACATAATGTGAGTATGAGAGAGAAAGTTGTACAAAAGTTGTACCAAAATAGTTGTAC
AAATATCATTGAGGAATTTGACAAAAGCTACACAAATAAGGGTTAATTGCTGTAAATAAATAAGGATGA
CGCATTAGAGAGATGTACCATTAGAGAATTTTTGGCAAGTCATTAAAAAGAAAGAATAAATTATTTTTAA
AATTAAAAGTTGAGTCATTTGATTAAACATGTGATTATTTAATGAATTGATGAAAGAGTTGGATTAAAGT
TGTATTAGTAATTAGAATTTGGTGTCAAATTTAATTTGACATTTGATCTTTTCCTATATATTGCCCCATAGA
GTCAGTTAACTCATTTTTATATTTCATAGATCAAATAAGAGAAATAACGGTATATTAATCCCTCCAAAAA
AAAAAAACGGTATATTTACTAAAAAATCTAAGCCACGTAGGAGGATAACAGGATCCCCGTAGGAGGATA

ACATCCAATCCAACCAATCACAACAATCCTGATGAGATAACCCACTTTAAGCCCACGCATCTGTGGCACA
TCTACATTATCTAAATCACACATTCTTCCACACATCTGAGCCACACAAAAACCAATCCACATCTTTATCAC
CCATTCTATAAAAAATCACACTTTGTGAGTCTACACTTTGATTCCCTTCAAACACATACAAAGAGAAGAG
ACTAATTAATTAATTAATCATCTTGAGAGAAAATGGAACGAGCTATACAAGGAAACGACGCTAGGGAAC
AAGCTAACAGTGAACGTTGGGATGGAGGATCAGGAGGTACCACTTCTCCCTTCAAACTTCCTGACGAAAG
TCCGAGTTGGACTGAGTGGCGGCTACATAACGATGAGACGAATTCGAATCAAGATAATCCCCTTGGTTTC
AAGGAAAGCTGGGGTTTCGGGAAAGTTGTATTTAAGAGATATCTCAGATACGACAGGACGGAAGCTTCA
CTGCACAGAGTCCTTGGATCTTGGACGGGAGATTCGGTTAACTATGCAGCATCTCGATTTTTCGGTTTCGA
CCAGATCGGATGTACCTATAGTATTCGGTTTCGAGGAGTTAGTATCACCGTTTCTGGAGGGTCGCGAACT
CTTCAGCATCTCTGTGAGATGGCAATTCGGTCTAAGCAAGAACTGCTACAGCTTGCCCCAATCGAAGTGG
AAAGTAATGTATCAAGAGGATGCCCTGAAGGTACTCAAACCTTCGAAAAAGAAAGCGAGTAAGTTAAAA
TGCTTCTTCGTCTCCTATTTATAATATGGTTTGTTATTGTTAATTTTGTTCTTGTAGAAGAGCTTAATTAAT
CGTTGTTGTTATGAAATACTATTTGTATGAGATGAACTGGTGTAATGTAATTCATTTACATAAGTGGAGTC
AGAATCAGAATGTTTCCTCCATAACTAACTAGACATGAAGACCTGCCGCGTACAATTGTCTTATATTTGA
ACAACTAAAATTGAACATCTTTTGCCACAACTTTATAAGTGGTTAATATAGCTCAAATATATGGTCAAGTT
CAATAGATTAATAATGGAAATATCAGTTATCGAAATTCATTAACAATCAACTTAACGTTATTAACTACTA
ATTTTATATCATCCCCTTTGATAAATGATAGTACACCAATTAGGAAGGAGCATGCTCGCCTAGGAGATTG
TCGTTTCCCGCCTTCAGTTTGCAAGCTGCTCTAGCCGTGTAGCCAATACGCAAACCGCCTCTCCCCGCGCG
TTGGGAATTACTAGCGCGTGTCGACAAGCTTGCATGCCGGTCAACATGGTGGAGCACGACACACTTGTCT
ACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCAACAAAGGGTAA
TATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATAGTGGAAAAGGA
AGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGT
GGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCA
AAGCAAGTGGATTGATGTGATAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGAT
ACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGA
TTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCC
ATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCC
CACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTG
ATATCTCCACTGACGTAAGGGATGACGCACAATCCCACTATCCTTCGCAAGACCCTTCCTCTATATAAGG
AAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGGTTTTGATAAAAGCGAACGTGGGGAAACCCG
AACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAGCAAACTTCTCTCTTGTCTTTCTTGCGTGAGC
GATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACAACGTTTTCTTTCACTGAAGCGAAATCAAAG
ATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACGTGTACTTGTCCTATTCTTGTCGGTGTGGTCT
TGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCATACATTACTTGTTACGATTCTGCTGACTTTC
GGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTGTTGCCTGTACTTCTTTCTTCTTCTTCTTGCTG
ATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGAGTTTTCCCGTGGTTTTCGAACTTGGAGAAAG
ATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGCCCATGGCGAAAAACGTTGCGATTTTCGGCTT
ATTGTTTTCTCTTCTTGTGTTGGTTCCTTCTCAGATCTTCGCCGCGGCTCCTCAGCCAAAACGACACCCCCA
TCTGTCTATCCACTGGCCCCTGGATCTGCTGCCCAAACTAACTCCATGGTGACCCTGGGATGCCTGGTCAA
GGGCTATTTCCCTGAGCCAGTGACAGTGACCTGGAACTCTGGATCCCTGTCCAGCGGTGTGCACACCTTC
CCAGCTGTCCTGCAGTCTGACCTCTACACTCTGAGCAGCTCAGTGACTGTCCCCTCCAGCACCTGGCCCA
GCGAGACCGTCACCTGCAACGTTGCCCACCCGGCCAGCAGCACCAAGGTGGACAAGAAAATTGTGCCCA
GGGATTGTGGTTGTAAGCCTTGCATATGTACAGTCCCAGAAGTATCATCTGTCTTCATCTTCCCCCCAAAG
CCCAAGGATGTGCTCACCATTACTCTGACTCCTAAGGTCACGTGTGTTGTGGTAGACATCAGCAAGGATG
ATCCCGAGGTCCAGTTCAGCTGGTTTGTAGATGATGTGGAGGTGCACACAGCTCAGACGCAACCCCGGGA
GGAGCAGTTCAACAGCACTTTCCGCTCAGTCAGTGAACTTCCCATCATGCACCAGGACTGGCTCAATGGC
AAGGAGCGATCGCTCACCATCACCATCACCATCACCATCACCATTAAAGGCCTATTTTCTTTAGTTTGAAT
TTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTTATGT
AATTTAATTTCTTTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATTTTAATTT
TATTAAAAAAAAAAAAAAAAAAAGACCGGGAATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAAC
ATTTGGCAATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATTATCATATAATTTCTGTT
GAATTACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTATGATTA
GAGTCCCGCAATTATACATTTAATACGCGATAGAAAACAAAATATAGCGCGCAAACTAGGATAAATTAT
CGCGCGCGGTGTCATCTATGTTACTAGATCTCTAGAGTCTCAAGCTTGGCGCGCCCACGTGACTAGTGGC

ACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACCCTGGCGTTACCCAACTTAATCGCCTTGCAGCA
CATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCA
GCCTGAATGGCGAATGCTAGAGCAGCTTGAGCTTGGATCAGATTGTCGTTTCCCGCCTTCAGTTTAAACT
ATCAGTGTTTGACAGGATATATTGGCGGGTAAACCTAAGAGAAAAGAGCGTTTA

Figure 4F

Expression cassette number 484 from 2X35S promoter to NOS terminator. PDISP/H1 from influenza A/California/7/2009 (H1N1) is underlined. (SEQ ID NO: 19)

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAA
AGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCT
GTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAA
AGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCG
TGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACG
ACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCA
ACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATA
GTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCC
TCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCA
ACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCACAATCCCACT
ATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGG
TTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAG
CAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACA
ACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACG
TGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCA
TACATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTG
TTGCCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGA
GTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGC
CCATGGCGAAAAACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTTGGTTCCTTCTCAGATCTTCG
CCGACACATTATGTATAGGTTATCATGCGAACAATTCAACAGACACTGTAGACACAGTACTAGAAAAGA
ATGTAACAGTAACACACTCTGTTAACCTTCTAGAAGACAAGCATAACGGGAAACTATGCAAACTAAGAG
GGGTAGCCCCATTGCATTTGGGTAAATGTAACATTGCTGGCTGGATCCTGGGAAATCCAGAGTGTGAATC
ACTCTCCACAGCAAGCTCATGGTCCTACATTGTGGAAACACCTAGTTCAGACAATGGAACGTGTTACCCA
GGAGATTTCATCGATTATGAGGAGCTAAGAGAGCAATTGAGCTCAGTGTCATCATTTGAAAGGTTTGAGA
TATTCCCCAAGACAAGTTCATGGCCCAATCATGACTCGAACAAAGGTGTAACGGCAGCATGTCCTCATGC
TGGAGCAAAAAGCTTCTACAAAAATTTAATATGGCTAGTTAAAAAAGGAAATTCATACCCAAAGCTCAG
CAAATCCTACATTAATGATAAAGGGAAAGAAGTCCTCGTGCTATGGGGCATTCACCATCCATCTACTAGT
GCTGACCAACAAAGTCTCTATCAGAATGCAGATGCATATGTTTTTGTGGGGTCATCAAGATACAGCAAGA
AGTTCAAGCCGGAAATAGCAATAAGACCCAAAGTGAGGGATCAAGAAGGGAGAATGAACTATTACTGG
ACACTAGTAGAGCCGGGAGACAAAATAACATTCGAAGCAACTGGAAATCTAGTGGTACCGAGATATGCA
TTCGCAATGGAAAGAAATGCTGGATCTGGTATTATCATTTCAGATACACCAGTCCACGATTGCAATACAA
CTTGTCAAACACCCAAGGGTGCTATAAACACCAGCCTCCCATTTCAGAATATACATCCGATCACAATTGG
AAAATGTCCAAAATATGTAAAAAGCACAAAATTGAGACTGGCCACAGGATTGAGGAATATCCCGTCTAT
TCAATCTAGAGGCCTATTTGGGGCCATTGCCGGTTTCATTGAAGGGGGGTGGACAGGGATGGTAGATGGA
TGGTACGGTTATCACCATCAAAATGAGCAGGGGTCAGGATATGCAGCCGACCTGAAGAGCACACAGAAT
GCCATTGACGAGATTACTAACAAAGTAAATTCTGTTATTGAAAAGATGAATACACAGTTCACAGCAGTAG
GTAAAGAGTTCAACCACCTGGAAAAAAGAATAGAGAATTTAAATAAAAAAGTTGATGATGGTTTCCTGG
ACATTTGGACTTACAATGCCGAACTGTTGGTTCTATTGGAAAATGAAAGAACTTTGGACTACCACGATTC
AAATGTGAAGAACTTATATGAAAAGGTAAGAAGCCAGCTAAAAAACAATGCCAAGGAAATTGGAAACG
GCTGCTTTGAATTTTACCACAAATGCGATAACACGTGCATGGAAAGTGTCAAAAATGGGACTTATGACTA
CCCAAAATACTCAGAGGAAGCAAAATTAAACAGAGAAGAAATAGATGGGGTAAAGCTGGAATCAACAA
GGATTTACCAGATTTTGGCGATCTATTCAACTGTCGCCAGTTCATTGGTACTGGTAGTCTCCCTGGGGGCA

ATCAGTTTCTGGATGTGCTCTAATGGGTCTCTACAGTGTAGAATATGTATTTAAAGGCCTATTTTCTTTAG
TTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTAT
TTTATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATT
TTAATTTTATTAAAAAAAAAAAAAAAAAAAGACCGGGAATTCGATATCAAGCTTATCGACCTGCAGATCGT
TCAAACATTTGGCAATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATTATCATATAATT
TCTGTTGAATTACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTA
TGATTAGAGTCCCGCAATTATACATTTAATACGCGATAGAAAACAAAATATAGCGCGCAAACTAGGATA
AATTATCGCGCGCGGTGTCATCTATGTTACTAGAT

Figure 4G

Amino acid sequence of PDISP-H1 from influenza A/California/7/2009 (H1N1) (SEQ ID NO: 20)

MAKNVAIFGLLFSLLVLVPSQIFADTLCIGYHANNSTDTVDTVLEKNVTVTHSVNLLEDK
HNGKLCKLRGVAPLHLGKCNIAGWILGNPECESLSTASSWSYIVETPSSDNGTCYPGDFI
DYEELREQLSSVSSFERFEIFPKTSSWPNHDSNKGVTAACPHAGAKSFYKNLIWLVKKGN
SYPKLSKSYINDKGKEVLVLWGIHHPSTSADQQSLYQNADAYVFVGSSRYSKKFKPEIAI
RPKVRDQEGRMNYYWTLVEPGDKITFEATGNLVVPRYAFAMERNAGSGIIISDTPVHDC
NTTCQTPKGAINTSLPFQNIHPITIGKCPKYVKSTKLRLATGLRNIPSIQSRGLFGAIAGFIE
GGWTGMVDGWYGYHHQNEQGSGYAADLKSTQNAIDEITNKVNSVIEKMNTQFTAVGK
EFNHLEKRIENLNKKVDDGFLDIWTYNAELLVLLENERTLDYHDSNVKNLYEKVRSQLK
NNAKEIGNGCFEFYHKCDNTCMESVKNGTYDYPKYSEEAKLNREEIDGVKLESTRIYQIL
AIYSTVASSLVLVVSLGAISFWMCSNGSLQCRICI

E-2X35S/CPMV-HT/PDISP/H3 Perth/NOS (Construct number 1019)

Figure 5A

IF-S2+S4-H3 Per.c (SEQ ID NO: 21)

TCTCAGATCTTCGCCCAAAAACTTCCTGGAAATGACAACA

Figure 5B

IF-S1a4-H3 Per.r (SEQ ID NO: 22)

ACTAAAGAAAATAGGCCTTCAAATGCAAATGTTGCACCTAATGTT

Figure 5C

Synthesized H3 gene (corresponding to nt 26-1726 from Genbank accession number GQ293081) (SEQ ID NO: 23)

ATGAAGACTATCATTGCTTTGAGCTACATTCTATGTCTGGTTTTCGCTCAAAAACTTCCTGGAAATGACAA
CAGCACGGCAACGCTGTGCCTTGGGCACCATGCAGTACCAAACGGAACGATAGTGAAAACAATCACGAA
TGACCAAATTGAAGTTACTAATGCTACTGAGCTGGTTCAGAGTTCCTCAACAGGTGAAATATGCGACAGT
CCTCATCAGATCCTTGATGGAAAAAACTGCACACTAATAGATGCTCTATTGGGAGACCCTCAGTGTGATG
GCTTCCAAAATAAGAAATGGGACCTTTTTGTTGAACGCAGCAAAGCCTACAGCAACTGTTACCCTTATGA
TGTGCCGGATTATGCCTCCCTTAGGTCACTAGTTGCCTCATCCGGCACACTGGAGTTTAACAATGAAAGCT
TCAATTGGACTGGAGTCACTCAAAACGGAACAAGCTCTGCTTGCATAAGGAGATCTAAAAACAGTTTCTT
TAGTAGATTGAATTGGTTGACCCACTTAAACTTCAAATACCCAGCATTGAACGTGACTATGCCAAACAAT
GAACAATTTGACAAATTGTACATTTGGGGGGTTCACCACCCGGGTACGGACAAAGACCAAATCTTCCTGT
ATGCTCAAGCATCAGGAAGAATCACAGTCTCTACCAAAAGAAGCCAACAAACCGTAAGCCCGAATATCG
GATCTAGACCCAGAGTAAGGAATATCCCTAGCAGAATAAGCATCTATTGGACAATAGTAAAACCGGGAG
ACATACTTTTGATTAACAGCACAGGGAATCTAATTGCTCCTAGGGGTTACTTCAAAATACGAAGTGGGAA
AAGCTCAATAATGAGATCAGATGCACCCATTGGCAAATGCAATTCTGAATGCATCACTCCAAATGGAAGC
ATTCCCAATGACAAACCATTCCAAAATGTAAACAGGATCACATACGGGGCCTGTCCCAGATATGTTAAGC
AAAACACTCTGAAATTGGCAACAGGGATGCGAAATGTACCAGAGAAACAAACTAGAGGCATATTTGGCG
CAATCGCGGGTTTCATAGAAAATGGTTGGGAGGGAATGGTGGATGGTTGGTACGGTTTCAGGCATCAAA
ATTCTGAGGGAAGAGGACAAGCAGCAGATCTCAAAAGCACTCAAGCAGCAATCGATCAAATCAATGGGA
AGCTGAATAGATTGATCGGGAAAACCAACGAGAAATTCCATCAGATTGAAAAAGAATTCTCAGAAGTCG
AAGGGAGAATTCAGGACCTTGAGAAATATGTTGAGGACACTAAAATAGATCTCTGGTCATACAACGCGG
AGCTTCTTGTTGCCCTGGAGAACCAACATACAATTGATCTAACTGACTCAGAAATGAACAAACTGTTTGA
AAAAACAAAGAAGCAACTGAGGGAAAATGCTGAGGATATGGGCAATGGTTGTTTCAAAATATACCACAA
ATGTGACAATGCCTGCATAGGATCAATCAGAAATGGAACTTATGACCACGATGTATACAGAGATGAAGC
ATTAAACAACCGGTTTCAGATCAAGGGAGTTGAGCTGAAGTCAGGGTACAAAGATTGGATCCTATGGATT
TCCTTTGCCATATCATGTTTTTTGCTTTGTGTTGCTTTGTTGGGGTTCATCATGTGGGCCTGCCAAAAAGGC
AACATTAGGTGCAACATTTGCATTTGA

Figure 5D

Expression cassette number 1019 from 2X35S promoter to NOS terminator. PDISP/H3 from influenza A/Perth/16/2009 (H3N2) is underlined. (SEQ ID NO: 24)

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAA
AGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCT
GTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAA
AGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCG
TGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACG
ACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCA
ACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATA
GTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCC
TCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCA
ACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCACAATCCCACT
ATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGG
TTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAG
CAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACA
ACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACG
TGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCA
TACATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTG
TTGCCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGA
GTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGC
CCATGGCGAAAAACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTTGGTTCCTTCTCAGATCTTCG
CCCAAAAACTTCCTGGAAATGACAACAGCACGGCAACGCTGTGCCTTGGGCACCATGCAGTACCAAACG
GAACGATAGTGAAAACAATCACGAATGACCAAATTGAAGTTACTAATGCTACTGAGCTGGTTCAGAGTTC
CTCAACAGGTGAAATATGCGACAGTCCTCATCAGATCCTTGATGGAAAAAACTGCACACTAATAGATGCT
CTATTGGGAGACCCTCAGTGTGATGGCTTCCAAAATAAGAAATGGGACCTTTTTGTTGAACGCAGCAAAG
CCTACAGCAACTGTTACCCTTATGATGTGCCGGATTATGCCTCCCTTAGGTCACTAGTTGCCTCATCCGGC
ACACTGGAGTTTAACAATGAAAGCTTCAATTGGACTGGAGTCACTCAAAACGGAACAAGCTCTGCTTGCA
TAAGGAGATCTAAAAACAGTTTCTTTAGTAGATTGAATTGGTTGACCCACTTAAACTTCAAATACCCAGC
ATTGAACGTGACTATGCCAAACAATGAACAATTTGACAAATTGTACATTTGGGGGGTTCACCACCCGGGT
ACGGACAAAGACCAAATCTTCCTGTATGCTCAAGCATCAGGAAGAATCACAGTCTCTACCAAAAGAAGC
CAACAAACCGTAAGCCCGAATATCGGATCTAGACCCAGAGTAAGGAATATCCCTAGCAGAATAAGCATC
TATTGGACAATAGTAAAACCGGGAGACATACTTTTGATTAACAGCACAGGGAATCTAATTGCTCCTAGGG
GTTACTTCAAAATACGAAGTGGGAAAAGCTCAATAATGAGATCAGATGCACCCATTGGCAAATGCAATT
CTGAATGCATCACTCCAAATGGAAGCATTCCCAATGACAAACCATTCCAAAATGTAAACAGGATCACATA
CGGGGCCTGTCCCAGATATGTTAAGCAAAACACTCTGAAATTGGCAACAGGGATGCGAAATGTACCAGA
GAAACAAACTAGAGGCATATTTGGCGCAATCGCGGGTTTCATAGAAAATGGTTGGGAGGGAATGGTGGA
TGGTTGGTACGGTTTCAGGCATCAAAATTCTGAGGGAAGAGGACAAGCAGCAGATCTCAAAAGCACTCA
AGCAGCAATCGATCAAATCAATGGGAAGCTGAATAGATTGATCGGGAAAACCAACGAGAAATTCCATCA
GATTGAAAAAGAATTCTCAGAAGTCGAAGGGAGAATTCAGGACCTTGAGAAATATGTTGAGGACACTAA
AATAGATCTCTGGTCATACAACGCGGAGCTTCTTGTTGCCCTGGAGAACCAACATACAATTGATCTAACT
GACTCAGAAATGAACAAACTGTTTGAAAAAACAAAGAAGCAACTGAGGGAAAATGCTGAGGATATGGG
CAATGGTTGTTTCAAAATATACCACAAATGTGACAATGCCTGCATAGGATCAATCAGAAATGGAACTTAT
GACCACGATGTATACAGAGATGAAGCATTAAACAACCGGTTTCAGATCAAGGGAGTTGAGCTGAAGTCA
GGGTACAAAGATTGGATCCTATGGATTTCCTTTGCCATATCATGTTTTTTGCTTTGTGTTGCTTTGTTGGGG
TTCATCATGTGGGCCTGCCAAAAAGGCAACATTAGGTGCAACATTTGCATTTGAAGGCCTATTTTCTTTAG
TTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTAT
TTTATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATT
TTAATTTTATTAAAAAAAAAAAAAAAAAAGACCGGGAATTCGATATCAAGCTTATCGACCTGCAGATCGT
TCAAACATTTGGCAATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATTATCATATAATT
TCTGTTGAATTACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTA

TGATTAGAGTCCCGCAATTATACATTTAATACGCGATAGAAAACAAAATATAGCGCGCAAACTAGGATA
AATTATCGCGCGCGGTGTCATCTATGTTACTAGAT

Figure 5E

Amino acid sequence of PDISP/H3 from influenza A/Perth/16/2009 (H3N2) (SEQ ID NO: 25)

MAKNVAIFGLLFSLLVLVPSQIFAQKLPGNDNSTATLCLGHHAVPNGTIVKTITNDQIEVT
NATELVQSSSTGEICDSPHQILDGKNCTLIDALLGDPQCDGFQNKKWDLFVERSKAYSNC
YPYDVPDYASLRSLVASSGTLEFNNESFNWTGVTQNGTSSACIRRSKNSFFSRLNWLTHL
NFKYPALNVTMPNNEQFDKLYIWGVHHPGTDKDQIFLYAQASGRITVSTKRSQQTVSPNI
GSRPRVRNIPSRISIYWTIVKPGDILLINSTGNLIAPRGYFKIRSGKSSIMRSDAPIGKCNSEC
ITPNGSIPNDKPFQNVNRITYGACPRYVKQNTLKLATGMRNVPEKQTRGIFGAIAGFIENG
WEGMVDGWYGFRHQNSEGRGQAADLKSTQAAIDQINGKLNRLIGKTNEKFHQIEKEFS
EVEGRIQDLEKYVEDTKIDLWSYNAELLVALENQHTIDLTDSEMNKLFEKTKKQLRENA
EDMGNGCFKIYHKCDNACIGSIRNGTYDHDVYRDEALNNRFQIKGVELKSGYKDWILWI
SFAISCFLLCVALLGFIMWACQKGNIRCNICI

F-2X35S/CPMV-HT/PDISP/HA B Brisbane/NOS (Construct number 1029)

Figure 6A

IF-S2+S4-B Bris.c (SEQ ID NO: 26)

TCTCAGATCTTCGCCGATCGAATCTGCACTGGAATAACAT

Figure 6B

IF-S1a4-B Bris.r (SEQ ID NO: 27)

ACTAAAGAAAATAGGCCTTTATAGACAGATGGAGCAAGAAACA

Figure 6C

Synthesized HA B Brisbane gene (corresponding to nt 34-1791 from Genbank accession number FJ766840) (SEQ ID NO: 28)

ATGAAGGCAATAATTGTACTACTCATGGTAGTAACATCCAATGCAGATCGAATCTGCACTGGAATAACAT
CGTCAAACTCACCACATGTCGTCAAAACTGCTACTCAAGGGGAGGTCAATGTGACTGGTGTAATACCACT
GACAACAACACCCACCAAATCTCATTTTGCAAATCTCAAAGGAACAGAAACCAGGGGGAAACTATGCCC
AAAATGCCTCAACTGCACAGATCTGGACGTAGCCTTGGGCAGACCAAAATGCACGGGGAAAATACCCTC
GGCAAGAGTTTCAATACTCCATGAAGTCAGACCTGTTACATCTGGGTGCTTTCCTATAATGCACGACAGA
ACAAAAATTAGACAGCTGCCTAACCTTCTCCGAGGATACGAACATATCAGGTTATCAACCCATAACGTTA
TCAATGCAGAAAATGCACCAGGAGGACCCTACAAAATTGGAACCTCAGGGTCTTGCCCTAACATTACCA
ATGGAAACGGATTTTTCGCAACAATGGCTTGGGCCGTCCCAAAAAACGACAAAAACAAAACAGCAACAA
ATCCATTAACAATAGAAGTACCATACATTTGTACAGAAGGAGAAGACCAAATTACCGTTTGGGGGTTCCA
CTCTGACAACGAGACCCAAATGGCAAAGCTCTATGGGGACTCAAAGCCCCAGAAGTTCACCTCATCTGCC
AACGGAGTGACCACACATTACGTTTCACAGATTGGTGGCTTCCCAAATCAAACAGAAGACGGAGGACTA
CCACAAAGTGGTAGAATTGTTGTTGATTACATGGTGCAAAAATCTGGGAAAACAGGAACAATTACCTATC
AAAGGGGTATTTTATTGCCTCAAAAGGTGTGGTGCGCAAGTGGCAGGAGCAAGGTAATAAAAGGATCCT
TGCCTTTAATTGGAGAAGCAGATTGCCTCCACGAAAAATACGGTGGATTAAACAAAAGCAAGCCTTACTA
CACAGGGGAACATGCAAAGGCCATAGGAAATTGCCCAATATGGGTGAAAACACCCTTGAAGCTGGCCAA
TGGAACCAAATATAGACCTCCTGCAAAACTATTAAAGGAAAGGGGTTTCTTCGGAGCTATTGCTGGTTTC
TTAGAAGGAGGATGGGAAGGAATGATTGCAGGTTGGCACGGATACACATCCCATGGGGCACATGGAGTA
GCGGTGGCAGCAGACCTTAAGAGCACTCAAGAGGCCATAAACAAGATAACAAAAAATCTCAACTCTTTG
AGTGAGCTGGAAGTAAAGAATCTTCAAAGACTAAGCGGTGCCATGGATGAACTCCACAACGAAATACTA
GAACTAGATGAGAAAGTGGATGATCTCAGAGCTGATACAATAAGCTCACAAATAGAACTCGCAGTCCTG
CTTTCCAATGAAGGAATAATAAACAGTGAAGATGAACATCTCTTGGCGCTTGAAAGAAAGCTGAAGAAA
ATGCTGGGCCCCTCTGCTGTAGAGATAGGGAATGGATGCTTTGAAACCAAACACAAGTGCAACCAGACC
TGTCTCGACAGAATAGCTGCTGGTACCTTTGATGCAGGAGAATTTTCTCTCCCCACCTTTGATTCACTGAA
TATTACTGCTGCATCTTTAAATGACGATGGATTGGATAATCATACTATACTGCTTTACTACTCAACTGCTG
CCTCCAGTTTGGCTGTAACACTGATGATAGCTATCTTTGTTGTTTATATGGTCTCCAGAGACAATGTTTCTT
GCTCCATCTGTCTATAA

Figure 6D

Expression cassette number 1029 from 2X35S promoter to NOS terminator. PDISP/HA from influenza B/Brisbane/60/2008 is underlined. (SEQ ID NO: 29)

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAA
AGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCT
GTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAA
AGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCG
TGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACG
ACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCA
ACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATA
GTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCC
TCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCA
ACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCACAATCCCACT
ATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGG
TTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAG
CAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACA
ACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACG
TGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCA
TACATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTG
TTGCCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGA
GTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGC
CCATGGCGAAAAACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTTGGTTCCTTCTCAGATCTTCG
CCGATCGAATCTGCACTGGAATAACATCGTCAAACTCACCACATGTCGTCAAAACTGCTACTCAAGGGGA
GGTCAATGTGACTGGTGTAATACCACTGACAACAACACCCACCAAATCTCATTTTGCAAATCTCAAAGGA
ACAGAAACCAGGGGGAAACTATGCCCAAAATGCCTCAACTGCACAGATCTGGACGTAGCCTTGGGCAGA
CCAAAATGCACGGGGAAAATACCCTCGGCAAGAGTTTCAATACTCCATGAAGTCAGACCTGTTACATCTG
GGTGCTTTCCTATAATGCACGACAGAACAAAAATTAGACAGCTGCCTAACCTTCTCCGAGGATACGAACA
TATCAGGTTATCAACCCATAACGTTATCAATGCAGAAAATGCACCAGGAGGACCCTACAAAATTGGAAC
CTCAGGGTCTTGCCCTAACATTACCAATGGAAACGGATTTTTCGCAACAATGGCTTGGGCCGTCCCAAAA
AACGACAAAAACAAAACAGCAACAAATCCATTAACAATAGAAGTACCATACATTTGTACAGAAGGAGAA
GACCAAATTACCGTTTGGGGGTTCCACTCTGACAACGAGACCCAAATGGCAAAGCTCTATGGGGACTCAA
AGCCCCAGAAGTTCACCTCATCTGCCAACGGAGTGACCACACATTACGTTTCACAGATTGGTGGCTTCCC
AAATCAAACAGAAGACGGAGGACTACCACAAAGTGGTAGAATTGTTGTTGATTACATGGTGCAAAAATC
TGGGAAAACAGGAACAATTACCTATCAAAGGGGTATTTTATTGCCTCAAAAGGTGTGGTGCGCAAGTGG
CAGGAGCAAGGTAATAAAAGGATCCTTGCCTTTAATTGGAGAAGCAGATTGCCTCCACGAAAAATACGG
TGGATTAAACAAAAGCAAGCCTTACTACACAGGGGAACATGCAAAGGCCATAGGAAATTGCCCAATATG
GGTGAAAACACCCTTGAAGCTGGCCAATGGAACCAAATATAGACCTCCTGCAAAACTATTAAAGGAAAG
GGGTTTCTTCGGAGCTATTGCTGGTTTCTTAGAAGGAGGATGGGAAGGAATGATTGCAGGTTGGCACGGA
TACACATCCCATGGGGCACATGGAGTAGCGGTGGCAGCAGACCTTAAGAGCACTCAAGAGGCCATAAAC
AAGATAACAAAAAATCTCAACTCTTTGAGTGAGCTGGAAGTAAAGAATCTTCAAAGACTAAGCGGTGCC
ATGGATGAACTCCACAACGAAATACTAGAACTAGATGAGAAAGTGGATGATCTCAGAGCTGATACAATA
AGCTCACAAATAGAACTCGCAGTCCTGCTTTCCAATGAAGGAATAATAAACAGTGAAGATGAACATCTCT
TGGCGCTTGAAAGAAAGCTGAAGAAAATGCTGGGCCCCTCTGCTGTAGAGATAGGGAATGGATGCTTTG
AAACCAAACACAAGTGCAACCAGACCTGTCTCGACAGAATAGCTGCTGGTACCTTTGATGCAGGAGAAT
TTTCTCTCCCCACCTTTGATTCACTGAATATTACTGCTGCATCTTTAAATGACGATGGATTGGATAATCAT
ACTATACTGCTTTACTACTCAACTGCTGCCTCCAGTTTGGCTGTAACACTGATGATAGCTATCTTTGTTGTT
TATATGGTCTCCAGAGACAATGTTTCTTGCTCCATCTGTCTATAAAGGCCTATTTTCTTTAGTTTGAATTTA
CTGTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTTATGTAAT
TTAATTTCTTTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTAT
TAAAAAAAAAAAAAAAAAAGACCGGGAATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATT
TGGCAATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATTATCATATAATTTCTGTTGAA
TTACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTATGATTAGAG

TCCCGCAATTATACATTTAATACGCGATAGAAAACAAAATATAGCGCGCAAACTAGGATAAATTATCGCG
CGCGGTGTCATCTATGTTACTAGAT

Figure 6E,

Amino acid sequence of PDISP/HA from influenza B/Brisbane/60/2008 SEQ ID NO: 30

MAKNVAIFGLLFSLLVLVPSQIFADRICTGITSSNSPHVVKTATQGEVNVTGVIPLTTTPTK
SHFANLKGTETRGKLCPKCLNCTDLDVALGRPKCTGKIPSARVSILHEVRPVTSGCFPIM
HDRTKIRQLPNLLRGYEHIRLSTHNVINAENAPGGPYKIGTSGSCPNITNGNGFFATMAW
AVPKNDKNKTATNPLTIEVPYICTEGEDQITVWGFHSDNETQMAKLYGDSKPQKFTSSA
NGVTTHYVSQIGGFPNQTEDGGLPQSGRIVVDYMVQKSGKTGTITYQRGILLPQKVWCA
SGRSKVIKGSLPLIGEADCLHEKYGGLNKSKPYYTGEHAKAIGNCPIWVKTPLKLANGTK
YRPPAKLLKERGFFGAIAGFLEGGWEGMIAGWHGYTSHGAHGVAVAADLKSTQEAINK
ITKNLNSLSELEVKNLQRLSGAMDELHNEILELDEKVDDLRADTISSQIELAVLLSNEGIIN
SEDEHLLALERKLKKMLGPSAVEIGNGCFETKHKCNQTCLDRIAAGTFDAGEFSLPTFDS
LNITAASLNDDGLDNHTILLYYSTAASSLAVTLMIAIFVVYMVSRDNVSCSICL

G-2X35S/CPMV-HT/PDISP/HA B Brisbane/NOS into BeYDV+Replicase amplification system (Construct number 1008)

Figure 6F

Schematic representation of construct 1194. SacII and StuI restriction enzyme sites used for plasmid linearization are annotated on the representation.

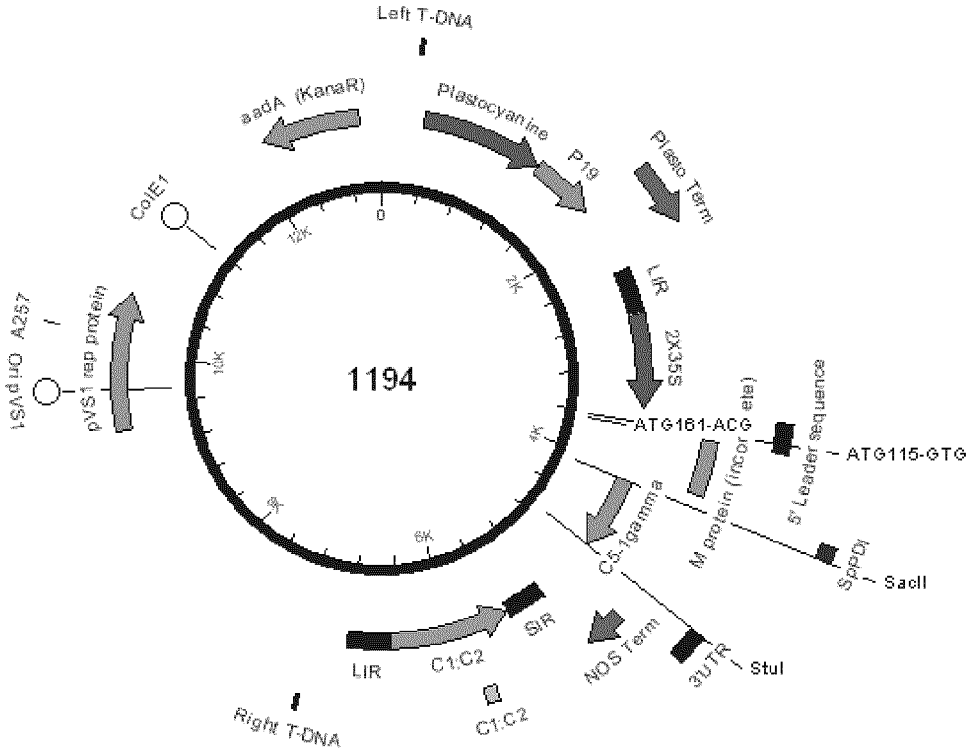


Figure 6G

Construct 1194 from left to right t-DNA borders (underlined). 2X35S/CPMV-HT/PDISP/NOS into BeYDV+Replicase amplification system with Plastocyanine-P19-Plastocyanine silencing inhibitor expression cassette (SEQ ID NO: 31)

TGGCAGGATATATTGTGGTGTAAACAAATTGACGCTTAGACAACTTAATAACACATTGCGGACGTTTTTA
ATGTACTGAATTAACGCCGAATCCCGGGCTGGTATATTTATATGTTGTCAAATAACTCAAAAACCATAAA
AGTTTAAGTTAGCAAGTGTGTACATTTTTACTTGAACAAAAATATTCACCTACTACTGTTATAAATCATTA
TTAAACATTAGAGTAAAGAAATATGGATGATAAGAACAAGAGTAGTGATATTTTGACAACAATTTTGTTG
CAACATTTGAGAAAATTTTGTTGTTCTCTCTTTTCATTGGTCAAAAACAATAGAGAGAGAAAAAGGAAGA
GGGAGAATAAAAACATAATGTGAGTATGAGAGAGAAAGTTGTACAAAAGTTGTACCAAAATAGTTGTAC
AAATATCATTGAGGAATTTGACAAAAGCTACACAAATAAGGGTTAATTGCTGTAAATAAATAAGGATGA

CGCATTAGAGAGATGTACCATTAGAGAATTTTTGGCAAGTCATTAAAAAGAAAGAATAAATTATTTTTAA
AATTAAAAGTTGAGTCATTTGATTAAACATGTGATTATTTAATGAATTGATGAAAGAGTTGGATTAAAGT
TGTATTAGTAATTAGAATTTGGTGTCAAATTTAATTTGACATTTGATCTTTTCCTATATATTGCCCCATAGA
GTCAGTTAACTCATTTTTATATTTCATAGATCAAATAAGAGAAATAACGGTATATTAATCCCTCCAAAAA
AAAAAAACGGTATATTTACTAAAAAATCTAAGCCACGTAGGAGGATAACAGGATCCCCGTAGGAGGATA
ACATCCAATCCAACCAATCACAACAATCCTGATGAGATAACCCACTTTAAGCCCACGCATCTGTGGCACA
TCTACATTATCTAAATCACACATTCTTCCACACATCTGAGCCACACAAAAACCAATCCACATCTTTATCAC
CCATTCTATAAAAAATCACACTTTGTGAGTCTACACTTTGATTCCCTTCAAACACATACAAAGAGAAGAG
ACTAATTAATTAATTAATCATCTTGAGAGAAAATGGAACGAGCTATACAAGGAAACGACGCTAGGGAAC
AAGCTAACAGTGAACGTTGGGATGGAGGATCAGGAGGTACCACTTCTCCCTTCAAACTTCCTGACGAAAG
TCCGAGTTGGACTGAGTGGCGGCTACATAACGATGAGACGAATTCGAATCAAGATAATCCCCTTGGTTTC
AAGGAAAGCTGGGGTTTCGGGAAAGTTGTATTTAAGAGATATCTCAGATACGACAGGACGGAAGCTTCA
CTGCACAGAGTCCTTGGATCTTGGACGGGAGATTCGGTTAACTATGCAGCATCTCGATTTTTCGGTTTCGA
CCAGATCGGATGTACCTATAGTATTCGGTTTCGAGGAGTTAGTATCACCGTTTCTGGAGGGTCGCGAACT
CTTCAGCATCTCTGTGAGATGGCAATTCGGTCTAAGCAAGAACTGCTACAGCTTGCCCCAATCGAAGTGG
AAAGTAATGTATCAAGAGGATGCCCTGAAGGTACTCAAACCTTCGAAAAAGAAAGCGAGTAAGTTAAAA
TGCTTCTTCGTCTCCTATTTATAATATGGTTTGTTATTGTTAATTTTGTTCTTGTAGAAGAGCTTAATTAAT
CGTTGTTGTTATGAAATACTATTTGTATGAGATGAACTGGTGTAATGTAATTCATTTACATAAGTGGAGTC
AGAATCAGAATGTTTCCTCCATAACTAACTAGACATGAAGACCTGCCGCGTACAATTGTCTTATATTTGA
ACAACTAAAATTGAACATCTTTTGCCACAACTTTATAAGTGGTTAATATAGCTCAAATATATGGTCAAGTT
CAATAGATTAATAATGGAAATATCAGTTATCGAAATTCATTAACAATCAACTTAACGTTATTAACTACTA
ATTTTATATCATCCCCTTTGATAAATGATAGTACACCAATTAGGAAGGAGCATGCTCGCCTAGGAGATTG
TCGTTTCCCGCCTTCAGTTTGCAAGCTGCTCTAGCCGTGTAGCCAATACGCAAACCGCCTCTCCCCGCGCG
TTGGGAATTACTAGCGCGTGTCGACACGCGTGGCGCGCCCTAGCAGAAGGCATGTTGTTGTGACTCCGAG
GGGTTGCCTCAAACTCTATCTTATAACCGGCGTGGAGGCATGGAGGCAAGGGCATTTTGGTAATTTAAGT
AGTTAGTGGAAAATGACGTCATTTACTTAAAGACGAAGTCTTGCGACAAGGGGGGCCCACGCCGAATTTT
AATATTACCGGCGTGGCCCCACCTTATCGCGAGTGCTTTAGCACGAGCGGTCCAGATTTAAAGTAGAAAA
GTTCCCGCCCACTAGGGTTAAAGGTGTTCACACTATAAAAGCATATACGATGTGATGGTATTTGATAAAG
CGTATATTGTATCAGGTATTTCCGTCGGATACGAATTATTCGTACAAGCTTCTTAAGCCGGTCAACATGGT
GGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGA
GACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTG
TGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTG
AAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAG
ACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACGACACACTTGTCTA
CTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCAACAAAGGGTAAT
ATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATAGTGGAAAAGGAA
GGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTG
GTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAA
AGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCACAATCCCACTATCCTTCGCAAGA
CCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGGTTTTGATAAAAGC
GAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAGCAAACTTCTCTCT
TGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACAACGTTTTCTTTCA
CTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACGTGTACTTGTCCTA
TTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCATACATTACTTGTT
ACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTGTTGCCTGTACTTC
TTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGAGTTTTCCCGTGGT
TTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGCCCATGGCGAAAA
ACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTTGGTTCCTTCTCAGATCTTCGCCGCGGCTCCTC
AGCCAAAACGACACCCCCATCTGTCTATCCACTGGCCCCTGGATCTGCTGCCCAAACTAACTCCATGGTG
ACCCTGGGATGCCTGGTCAAGGGCTATTTCCCTGAGCCAGTGACAGTGACCTGGAACTCTGGATCCCTGT
CCAGCGGTGTGCACACCTTCCCAGCTGTCCTGCAGTCTGACCTCTACACTCTGAGCAGCTCAGTGACTGTC
CCCTCCAGCACCTGGCCCAGCGAGACCGTCACCTGCAACGTTGCCCACCCGGCCAGCAGCACCAAGGTG
GACAAGAAAATTGTGCCCAGGGATTGTGGTTGTAAGCCTTGCATATGTACAGTCCCAGAAGTATCATCTG
TCTTCATCTTCCCCCCAAAGCCCAAGGATGTGCTCACCATTACTCTGACTCCTAAGGTCACGTGTGTTGTG

GTAGACATCAGCAAGGATGATCCCGAGGTCCAGTTCAGCTGGTTTGTAGATGATGTGGAGGTGCACACA
GCTCAGACGCAACCCCGGGAGGAGCAGTTCAACAGCACTTTCCGCTCAGTCAGTGAACTTCCCATCATGC
ACCAGGACTGGCTCAATGGCAAGGAAGGCCTATTTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATT
TCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTTATGTAATTTAATTTCTTTGTGAGCTC
CTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTATTAAAAAAAAAAAAAAAAA
AGACCGGGAATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCAATAAAGTTTCTTAA
GATTGAATCCTGTTGCCGGTCTTGCGATGATTATCATATAATTTCTGTTGAATTACGTTAAGCATGTAATA
ATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTATGATTAGAGTCCCGCAATTATACATTTA
ATACGCGATAGAAAACAAAATATAGCGCGCAAACTAGGATAAATTATCGCGCGCGGTGTCATCTATGTT
ACTAGATCTCTAGAGTCTCAAGCTTGGCGCGGGGTACCGAGCTCGAATTCCGAGTGTACTTCAAGTCAGT
TGGAAATCAATAAAATGATTATTTTATGAATATATTTCATTGTGCAAGTAGATAGAAATTACATATGTTAC
ATAACACACGAAATAAACAAAAAAACACAATCCAAAACAAACACCCCAAACAAAATAACACTATATAT
ATCCTCGTATGAGGAGAGGCACGTTCAGTGACTCGACGATTCCCGAGCAAAAAAAGTCTCCCCGTCACAC
ATATAGTGGGTGACGCAATTATCTTCAAAGTAATCCTTCTGTTGACTTGTCATTGATAACATCCAGTCTTC
GTCAGGATTGCAAAGAATTATAGAAGGGATCCCACCTTTTATTTTCTTCTTTTTTCCATATTTAGGGTTGA
CAGTGAAATCAGACTGGCAACCTATTAATTGCTTCCACAATGGGACGAACTTGAAGGGGATGTCGTCGAT
GATATTATAGGTGGCGTGTTCATCGTAGTTGGTGAAGTCGATGGTCCCGTTCCAGTAGTTGTGTCGCCCGA
GACTTCTAGCCCAGGTGGTCTTTCCGGTACGAGTTGGTCCGCAGATGTAGAGGCTGGGGTGTCTGACCCC
AGTCCTTCCCTCATCCTGGTTAGATCGGCCATCCACTCAAGGTCAGATTGTGCTTGATCGTAGGAGACAG
GATGTATGAAAGTGTAGGCATCGATGCTTACATGATATAGGTGCGTCTCTCTCCAGTTGTGCAGATCTTCG
TGGCAGCGGAGATCTGATTCTGTGAAGGGCGACACGTACTGCTCAGGTTGTGGAGGAAATAATTTGTTGG
CTGAATATTCCAGCCATTGAAGCTTTGTTGCCCATTCATGAGGGAATTCTTCTTTGATCATGTCAAGATAC
TCCTCCTTAGACGTTGCAGTCTGGATAATAGTTCGCCATCGTGCGTCAGATTTGCGAGGAGAGACCTTAT
GATCTCGGAAATCTCCTCTGGTTTTAATATCTCCGTCCTTTGATATGTAATCAAGGACTTGTTTAGAGTTTC
TAGCTGGCTGGATATTAGGGTGATTTCCTTCAAAATCGAAAAAAGAAGGATCCCTAATACAAGGTTTTTT
ATCAAGCTGGATAAGAGCATGATAGTGGGTAGTGCCATCTTGATGAAGCTCAGAAGCAACACCAAGGAA
GAAAATAAGAAAAGGTGTGAGTTTCTCCCAGAGAAACTGGAATAAATCATCTCTTTGAGATGAGCACTTG
GGGTAGGTAAGGAAAACATATTTAGATTGGAGTCTGAAGTTCTTGCTAGCAGAAGGCATGTTGTTGTGAC
TCCGAGGGGTTGCCTCAAACTCTATCTTATAACCGGCGTGGAGGCATGGAGGCAAGGGCATTTTGGTAAT
TTAAGTAGTTAGTGGAAAATGACGTCATTTACTTAAAGACGAAGTCTTGCGACAAGGGGGGCCCACGCC
GAATTTTAATATTACCGGCGTGGCCCCACCTTATCGCGAGTGCTTTAGCACGAGCGGTCCAGATTTAAAG
TAGAAAAGTTCCCGCCCACTAGGGTTAAAGGTGTTCACACTATAAAAGCATATACGATGTGATGGTATTT
GATGGAGCGTATATTGTATCAGGTATTTCCGTCGGATACGAATTATTCGTACGGCCGGCCACTAGTGGCA
CTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACCCTGGCGTTACCCAACTTAATCGCCTTGCAGCAC
ATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAG
CCTGAATGGCGAATGCTAGAGCAGCTTGAGCTTGGATCAGATTGTCGTTTCCCGCCTTCAGTTTAAACTAT
CAGTGTTTGACAGGATATATTGGCGG<u>GTAAACCTAAGAGAAAAGAGCGTTTA</u>

Figure 6H

Expression cassette number 1008 from BeYDV left LIR to BeYDV right LIR. PDISP/HA from influenza B/Brisbane/60/2008 is underlined. (SEQ ID NO: 32)

CTAGCAGAAGGCATGTTGTTGTGACTCCGAGGGGTTGCCTCAAACTCTATCTTATAACCGGCGTGGAGGC
ATGGAGGCAAGGGCATTTTGGTAATTTAAGTAGTTAGTGGAAAATGACGTCATTTACTTAAAGACGAAGT
CTTGCGACAAGGGGGGCCCACGCCGAATTTTAATATTACCGGCGTGGCCCCACCTTATCGCGAGTGCTTT
AGCACGAGCGGTCCAGATTTAAAGTAGAAAAGTTCCCGCCCACTAGGGTTAAAGGTGTTCACACTATAA
AAGCATATACGATGTGATGGTATTTGATAAAGCGTATATTGTATCAGGTATTTCCGTCGGATACGAATTA
TTCGTACAAGCTTCTTAAGCCGGTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAA
GATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTC
GGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAAT
GCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGAC

CCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGAT
GTGATAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACC
AAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTAT
CTGTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGA
AAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATC
GTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAA
GGGATGACGCACAATCCCACTATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAG
AGGTATTAAAATCTTAATAGGTTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAA
CTCTCTCTCATCTCTCTTAAAGCAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGA
TCGTGCTTCGGCACCAGTACAACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAG
TGCGGCGCCATTAAATAACGTGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTG
GAGGCTGCTGTTCAGCCCCATACATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTAC
TTCTGCTTGACGAGGTATTGTTGCCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCT
AGTATTTTCTTTGAAACAGAGTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATAT
TCTGCCCAAATTTGTCGGGCCCATGGCGAAAAACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTT
GGTTCCTTCTCAGATCTTCGCCGATCGAATCTGCACTGGAATAACATCGTCAAACTCACCACATGTCGTCA
AAACTGCTACTCAAGGGGAGGTCAATGTGACTGGTGTAATACCACTGACAACAACACCCACCAAATCTC
ATTTTGCAAATCTCAAAGGAACAGAAACCAGGGGGAAACTATGCCCAAAATGCCTCAACTGCACAGATC
TGGACGTAGCCTTGGGCAGACCAAAATGCACGGGGAAAATACCCTCGGCAAGAGTTTCAATACTCCATG
AAGTCAGACCTGTTACATCTGGGTGCTTTCCTATAATGCACGACAGAACAAAAATTAGACAGCTGCCTAA
CCTTCTCCGAGGATACGAACATATCAGGTTATCAACCCATAACGTTATCAATGCAGAAAATGCACCAGGA
GGACCCTACAAAATTGGAACCTCAGGGTCTTGCCCTAACATTACCAATGGAAACGGATTTTTCGCAACAA
TGGCTTGGGCCGTCCCAAAAAACGACAAAAACAAAACAGCAACAAATCCATTAACAATAGAAGTACCAT
ACATTTGTACAGAAGGAGAAGACCAAATTACCGTTTGGGGGTTCCACTCTGACAACGAGACCCAAATGG
CAAAGCTCTATGGGGACTCAAAGCCCCAGAAGTTCACCTCATCTGCCAACGGAGTGACCACACATTACGT
TTCACAGATTGGTGGCTTCCCAAATCAAACAGAAGACGGAGGACTACCACAAAGTGGTAGAATTGTTGTT
GATTACATGGTGCAAAAATCTGGGAAAACAGGAACAATTACCTATCAAAGGGGTATTTTATTGCCTCAAA
AGGTGTGGTGCGCAAGTGGCAGGAGCAAGGTAATAAAAGGATCCTTGCCTTTAATTGGAGAAGCAGATT
GCCTCCACGAAAAATACGGTGGATTAAACAAAAGCAAGCCTTACTACACAGGGGAACATGCAAAGGCCA
TAGGAAATTGCCCAATATGGGTGAAAACACCCTTGAAGCTGGCCAATGGAACCAAATATAGACCTCCTG
CAAAACTATTAAAGGAAAGGGGTTTCTTCGGAGCTATTGCTGGTTTCTTAGAAGGAGGATGGGAAGGAA
TGATTGCAGGTTGGCACGGATACACATCCCATGGGGCACATGGAGTAGCGGTGGCAGCAGACCTTAAGA
GCACTCAAGAGGCCATAAACAAGATAACAAAAAATCTCAACTCTTTGAGTGAGCTGGAAGTAAAGAATC
TTCAAAGACTAAGCGGTGCCATGGATGAACTCCACAACGAAATACTAGAACTAGATGAGAAAGTGGATG
ATCTCAGAGCTGATACAATAAGCTCACAAATAGAACTCGCAGTCCTGCTTTCCAATGAAGGAATAATAAA
CAGTGAAGATGAACATCTCTTGGCGCTTGAAAGAAAGCTGAAGAAAATGCTGGGCCCCTCTGCTGTAGA
GATAGGGAATGGATGCTTTGAAACCAAACACAAGTGCAACCAGACCTGTCTCGACAGAATAGCTGCTGG
TACCTTTGATGCAGGAGAATTTTCTCTCCCCACCTTTGATTCACTGAATATTACTGCTGCATCTTTAAATG
ACGATGGATTGGATAATCATACTATACTGCTTTACTACTCAACTGCTGCCTCCAGTTTGGCTGTAACACTG
ATGATAGCTATCTTTGTTGTTTATATGGTCTCCAGAGACAATGTTTCTTGCTCCATCTGTCTATAAAGGCCT
ATTTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAG
AGTGTGTTTATTTTATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACA
CAAAAAGATTTTAATTTTATTAAAAAAAAAAAAAAAAAAGACCGGGAATTCGATATCAAGCTTATCGAC
CTGCAGATCGTTCAAACATTTGGCAATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATT
ATCATATAATTTCTGTTGAATTACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAG
ATGGGTTTTTATGATTAGAGTCCCGCAATTATACATTTAATACGCGATAGAAAACAAAATATAGCGCGCA
AACTAGGATAAATTATCGCGCGCGGTGTCATCTATGTTACTAGATCTCTAGAGTCTCAAGCTTGGCGCGG
GGTACCGAGCTCGAATTCCGAGTGTACTTCAAGTCAGTTGGAAATCAATAAAATGATTATTTTATGAATA
TATTTCATTGTGCAAGTAGATAGAAATTACATATGTTACATAACACACGAAATAAACAAAAAAACACAAT
CCAAAACAAACACCCCAAACAAAATAACACTATATATATCCTCGTATGAGGAGAGGCACGTTCAGTGAC
TCGACGATTCCCGAGCAAAAAAAGTCTCCCCGTCACACATATAGTGGGTGACGCAATTATCTTCAAAGTA
ATCCTTCTGTTGACTTGTCATTGATAACATCCAGTCTTCGTCAGGATTGCAAAGAATTATAGAAGGGATCC
CACCTTTTATTTTCTTCTTTTTTCCATATTTAGGGTTGACAGTGAAATCAGACTGGCAACCTATTAATTGCT
TCCACAATGGGACGAACTTGAAGGGGATGTCGTCGATGATATTATAGGTGGCGTGTTCATCGTAGTTGGT

GAAGTCGATGGTCCCGTTCCAGTAGTTGTGTCGCCCGAGACTTCTAGCCCAGGTGGTCTTTCCGGTACGA
GTTGGTCCGCAGATGTAGAGGCTGGGGTGTCTGACCCCAGTCCTTCCCTCATCCTGGTTAGATCGGCCATC
CACTCAAGGTCAGATTGTGCTTGATCGTAGGAGACAGGATGTATGAAAGTGTAGGCATCGATGCTTACAT
GATATAGGTGCGTCTCTCTCCAGTTGTGCAGATCTTCGTGGCAGCGGAGATCTGATTCTGTGAAGGGCGA
CACGTACTGCTCAGGTTGTGGAGGAAATAATTTGTTGGCTGAATATTCCAGCCATTGAAGCTTTGTTGCCC
ATTCATGAGGGAATTCTTCTTTGATCATGTCAAGATACTCCTCCTTAGACGTTGCAGTCTGGATAATAGTT
CGCCATCGTGCGTCAGATTTGCGAGGAGAGACCTTATGATCTCGGAAATCTCCTCTGGTTTTAATATCTCC
GTCCTTTGATATGTAATCAAGGACTTGTTTAGAGTTTCTAGCTGGCTGGATATTAGGGTGATTTCCTTCAA
AATCGAAAAAAGAAGGATCCCTAATACAAGGTTTTTTATCAAGCTGGATAAGAGCATGATAGTGGGTAG
TGCCATCTTGATGAAGCTCAGAAGCAACACCAAGGAAGAAAATAAGAAAAGGTGTGAGTTTCTCCCAGA
GAAACTGGAATAAATCATCTCTTTGAGATGAGCACTTGGGGTAGGTAAGGAAAACATATTTAGATTGGA
GTCTGAAGTTCTTGCTAGCAGAAGGCATGTTGTTGTGACTCCGAGGGGTTGCCTCAAACTCTATCTTATAA
CCGGCGTGGAGGCATGGAGGCAAGGGCATTTTGGTAATTTAAGTAGTTAGTGGAAAATGACGTCATTTAC
TTAAAGACGAAGTCTTGCGACAAGGGGGGCCCACGCCGAATTTTAATATTACCGGCGTGGCCCCACCTTA
TCGCGAGTGCTTTAGCACGAGCGGTCCAGATTTAAAGTAGAAAAGTTCCCGCCCACTAGGGTTAAAGGTG
TTCACACTATAAAAGCATATACGATGTGATGGTATTTGATGGAGCGTATATTGTATCAGGTATTTCCGTCG
GATACGAATTATTCGTAC

H-2X35S/CPMV-HT/PDISP/HA B Brisbane/H5 Indonesia transmembrane domain and cytoplasmic tail (H5Indo TMCT)/NOS into BeYDV+Replicase amplification system (Construct number 1009)

Figure 7A

dTmH5I-B Bris.r (SEQ ID NO: 33)

TTGACAGTATTTGGTAATTATCCAATCCATCGTCATTTAAAGATGCAGCA

Figure 7B

B Bris-dTmH5I.c (SEQ ID NO: 34)

CATCTTTAAATGACGATGGATTGGATAATTACCAAATACTGTCAATTTAT

Figure 7C

IF-S1aS4-dTmH5I.r (SEQ ID NO: 35)

ACTAAAGAAAATAGGCCTTTAAATGCAAATTCTGCATTGTAACGATCCAT

Figure 7D,

Expression cassette number 1009 from BeYDV left LIR to BeYDV right LIR. PDISP/HA B Brisbane/H5Indo TMCT is underlined. SEQ ID NO:36

CTAGCAGAAGGCATGTTGTTGTGACTCCGAGGGGTTGCCTCAAACTCTATCTTATAACCGGCGTGGAGGC
ATGGAGGCAAGGGCATTTTGGTAATTTAAGTAGTTAGTGGAAAATGACGTCATTTACTTAAAGACGAAGT
CTTGCGACAAGGGGGGCCCACGCCGAATTTTAATATTACCGGCGTGGCCCCACCTTATCGCGAGTGCTTT
AGCACGAGCGGTCCAGATTTAAAGTAGAAAAGTTCCCGCCCACTAGGGTTAAAGGTGTTCACACTATAA
AAGCATATACGATGTGATGGTATTTGATAAAGCGTATATTGTATCAGGTATTTCCGTCGGATACGAATTA
TTCGTACAAGCTTCTTAAGCCGGTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAA
GATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTC
GGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAAT
GCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGAC
CCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGAT
GTGATAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACC
AAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTAT
CTGTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGA
AAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATC
GTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAA
GGGATGACGCACAATCCCACTATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAG
AGGTATTAAAATCTTAATAGGTTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAA

CTCTCTCTCATCTCTCTTAAAGCAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGA
TCGTGCTTCGGCACCAGTACAACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAG
TGCGGCGCCATTAAATAACGTGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTG
GAGGCTGCTGTTCAGCCCCATACATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTAC
TTCTGCTTGACGAGGTATTGTTGCCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCT
AGTATTTTCTTTGAAACAGAGTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATAT
TCTGCCCAAATTTGTCGGGCCCATGGCGAAAAACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTT
GGTTCCTTCTCAGATCTTCGCCGATCGAATCTGCACTGGAATAACATCGTCAAACTCACCACATGTCGTCA
AAACTGCTACTCAAGGGGAGGTCAATGTGACTGGTGTAATACCACTGACAACAACACCCACCAAATCTC
ATTTTGCAAATCTCAAAGGAACAGAAACCAGGGGGAAACTATGCCCAAAATGCCTCAACTGCACAGATC
TGGACGTAGCCTTGGGCAGACCAAAATGCACGGGGAAAATACCCTCGGCAAGAGTTTCAATACTCCATG
AAGTCAGACCTGTTACATCTGGGTGCTTTCCTATAATGCACGACAGAACAAAAATTAGACAGCTGCCTAA
CCTTCTCCGAGGATACGAACATATCAGGTTATCAACCCATAACGTTATCAATGCAGAAAATGCACCAGGA
GGACCCTACAAAATTGGAACCTCAGGGTCTTGCCCTAACATTACCAATGGAAACGGATTTTTCGCAACAA
TGGCTTGGGCCGTCCCAAAAAACGACAAAAACAAAACAGCAACAAATCCATTAACAATAGAAGTACCAT
ACATTTGTACAGAAGGAGAAGACCAAATTACCGTTTGGGGGTTCCACTCTGACAACGAGACCCAAATGG
CAAAGCTCTATGGGGACTCAAAGCCCCAGAAGTTCACCTCATCTGCCAACGGAGTGACCACACATTACGT
TTCACAGATTGGTGGCTTCCCAAATCAAACAGAAGACGGAGGACTACCACAAAGTGGTAGAATTGTTGTT
GATTACATGGTGCAAAAATCTGGGAAAACAGGAACAATTACCTATCAAAGGGGTATTTTATTGCCTCAAA
AGGTGTGGTGCGCAAGTGGCAGGAGCAAGGTAATAAAAGGATCCTTGCCTTTAATTGGAGAAGCAGATT
GCCTCCACGAAAAATACGGTGGATTAAACAAAAGCAAGCCTTACTACACAGGGGAACATGCAAAGGCCA
TAGGAAATTGCCCAATATGGGTGAAAACACCCTTGAAGCTGGCCAATGGAACCAAATATAGACCTCCTG
CAAAACTATTAAAGGAAAGGGGTTTCTTCGGAGCTATTGCTGGTTTCTTAGAAGGAGGATGGGAAGGAA
TGATTGCAGGTTGGCACGGATACACATCCCATGGGGCACATGGAGTAGCGGTGGCAGCAGACCTTAAGA
GCACTCAAGAGGCCATAAACAAGATAACAAAAAATCTCAACTCTTTGAGTGAGCTGGAAGTAAAGAATC
TTCAAAGACTAAGCGGTGCCATGGATGAACTCCACAACGAAATACTAGAACTAGATGAGAAAGTGGATG
ATCTCAGAGCTGATACAATAAGCTCACAAATAGAACTCGCAGTCCTGCTTTCCAATGAAGGAATAATAAA
CAGTGAAGATGAACATCTCTTGGCGCTTGAAAGAAAGCTGAAGAAAATGCTGGGCCCCTCTGCTGTAGA
GATAGGGAATGGATGCTTTGAAACCAAACACAAGTGCAACCAGACCTGTCTCGACAGAATAGCTGCTGG
TACCTTTGATGCAGGAGAATTTTCTCTCCCCACCTTTGATTCACTGAATATTACTGCTGCATCTTTAAATG
ACGATGGATTGGATAATTACCAAATACTGTCAATTTATTCAACAGTGGCGAGTTCCCTAGCACTGGCAAT
CATGATGGCTGGTCTATCTTTATGGATGTGCTCCAATGGATCGTTACAATGCAGAATTTGCATTTAAAGGC
CTATTTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTC
AGAGTGTGTTTATTTTATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGG
ACACAAAAAGATTTTAATTTTATTAAAAAAAAAAAAAAAAAAGACCGGGAATTCGATATCAAGCTTATC
GACCTGCAGATCGTTCAAACATTTGGCAATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATG
ATTATCATATAATTTCTGTTGAATTACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTAT
GAGATGGGTTTTTATGATTAGAGTCCCGCAATTATACATTTAATACGCGATAGAAAACAAAATATAGCGC
GCAAACTAGGATAAATTATCGCGCGCGGTGTCATCTATGTTACTAGATCTCTAGAGTCTCAAGCTTGGCG
CGGGGTACCGAGCTCGAATTCCGAGTGTACTTCAAGTCAGTTGGAAATCAATAAAATGATTATTTTATGA
ATATATTTCATTGTGCAAGTAGATAGAAATTACATATGTTACATAACACACGAAATAAACAAAAAAACAC
AATCCAAAACAAACACCCCAAACAAAATAACACTATATATATCCTCGTATGAGGAGAGGCACGTTCAGT
GACTCGACGATTCCCGAGCAAAAAAAGTCTCCCCGTCACACATATAGTGGGTGACGCAATTATCTTCAAA
GTAATCCTTCTGTTGACTTGTCATTGATAACATCCAGTCTTCGTCAGGATTGCAAAGAATTATAGAAGGG
ATCCCACCTTTTATTTTCTTCTTTTTTCCATATTTAGGGTTGACAGTGAAATCAGACTGGCAACCTATTAAT
TGCTTCCACAATGGGACGAACTTGAAGGGGATGTCGTCGATGATATTATAGGTGGCGTGTTCATCGTAGT
TGGTGAAGTCGATGGTCCCGTTCCAGTAGTTGTGTCGCCCGAGACTTCTAGCCCAGGTGGTCTTTCCGGTA
CGAGTTGGTCCGCAGATGTAGAGGCTGGGGTGTCTGACCCCAGTCCTTCCCTCATCCTGGTTAGATCGGC
CATCCACTCAAGGTCAGATTGTGCTTGATCGTAGGAGACAGGATGTATGAAAGTGTAGGCATCGATGCTT
ACATGATATAGGTGCGTCTCTCTCCAGTTGTGCAGATCTTCGTGGCAGCGGAGATCTGATTCTGTGAAGG
GCGACACGTACTGCTCAGGTTGTGGAGGAAATAATTTGTTGGCTGAATATTCCAGCCATTGAAGCTTTGT
TGCCCATTCATGAGGGAATTCTTCTTTGATCATGTCAAGATACTCCTCCTTAGACGTTGCAGTCTGGATAA
TAGTTCGCCATCGTGCGTCAGATTTGCGAGGAGAGACCTTATGATCTCGGAAATCTCCTCTGGTTTTAATA
TCTCCGTCCTTTGATATGTAATCAAGGACTTGTTTAGAGTTTCTAGCTGGCTGGATATTAGGGTGATTTCC

TTCAAAATCGAAAAAAGAAGGATCCCTAATACAAGGTTTTTTATCAAGCTGGATAAGAGCATGATAGTG
GGTAGTGCCATCTTGATGAAGCTCAGAAGCAACACCAAGGAAGAAAATAAGAAAAGGTGTGAGTTTCTC
CCAGAGAAACTGGAATAAATCATCTCTTTGAGATGAGCACTTGGGGTAGGTAAGGAAAACATATTTAGA
TTGGAGTCTGAAGTTCTTGCTAGCAGAAGGCATGTTGTTGTGACTCCGAGGGGTTGCCTCAAACTCTATCT
TATAACCGGCGTGGAGGCATGGAGGCAAGGGCATTTTGGTAATTTAAGTAGTTAGTGGAAAATGACGTC
ATTTACTTAAAGACGAAGTCTTGCGACAAGGGGGGCCCACGCCGAATTTTAATATTACCGGCGTGGCCCC
ACCTTATCGCGAGTGCTTTAGCACGAGCGGTCCAGATTTAAAGTAGAAAAGTTCCCGCCCACTAGGGTTA
AAGGTGTTCACACTATAAAAGCATATACGATGTGATGGTATTTGATGGAGCGTATATTGTATCAGGTATT
TCCGTCGGATACGAATTATTCGTAC

Figure 7E,

Amino acid sequence of PDISP/HA B Brisbane/H5Indo TMCT (SEQ ID NO: 37)

MAKNVAIFGLLFSLLVLVPSQIFADRICTGITSSNSPHVVKTATQGEVNVTGVIPLTTTPTK
SHFANLKGTETRGKLCPKCLNCTDLDVALGRPKCTGKIPSARVSILHEVRPVTSGCFPIM
HDRTKIRQLPNLLRGYEHIRLSTHNVINAENAPGGPYKIGTSGSCPNITNGNGFFATMAW
AVPKNDKNKTATNPLTIEVPYICTEGEDQITVWGFHSDNETQMAKLYGDSKPQKFTSSA
NGVTTHYVSQIGGFPNQTEDGGLPQSGRIVVDYMVQKSGKTGTITYQRGILLPQKVWCA
SGRSKVIKGSLPLIGEADCLHEKYGGLNKSKPYYTGEHAKAIGNCPIWVKTPLKLANGTK
YRPPAKLLKERGFFGAIAGFLEGGWEGMIAGWHGYTSHGAHGVAVAADLKSTQEAINK
ITKNLNSLSELEVKNLQRLSGAMDELHNEILELDEKVDDLRADTISSQIELAVLLSNEGIIN
SEDEHLLALERKLKKMLGPSAVEIGNGCFETKHKCNQTCLDRIAAGTFDAGEFSLPTFDS
LNITAASLNDDGLDNYQILSIYSTVASSLALAIMMAGLSLWMCSNGSLQCRICI

I-2X35S/CPMV-HT/PDISP/HA B Brisbane with deleted proteolytic loop/NOS into BeYDV+Replicase amplification system (Construct number 1059)

Figure 8A,

1039+1059.r (SEQ ID NO: 38)

CTTCCCATCCTCCACCAGGAGGTCTATATTTGGTTCCATTGGCCAGCTTCAA

Figure 8B

1039+1059.c (SEQ ID NO: 39)

CAAATATAGACCTCCTGGTGGAGGATGGGAAGGAATGATTGCAGGTTGGCAC

Figure 8C,

Expression cassette number 1059 from BeYDV left LIR to BeYDV right LIR. PDISP/HA from influenza B/Brisbane/60/2008 with deleted proteolytic loop is underlined. (SEQ ID NO: 40)

CTAGCAGAAGGCATGTTGTTGTGACTCCGAGGGGTTGCCTCAAACTCTATCTTATAACCGGCGTGGAGGC
ATGGAGGCAAGGGCATTTTGGTAATTTAAGTAGTTAGTGGAAAATGACGTCATTTACTTAAAGACGAAGT
CTTGCGACAAGGGGGGCCCACGCCGAATTTTAATATTACCGGCGTGGCCCCACCTTATCGCGAGTGCTTT
AGCACGAGCGGTCCAGATTTAAAGTAGAAAAGTTCCCGCCCACTAGGGTTAAAGGTGTTCACACTATAA
AAGCATATACGATGTGATGGTATTTGATAAAGCGTATATTGTATCAGGTATTTCCGTCGGATACGAATTA
TTCGTACAAGCTTCTTAAGCCGGTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAA
GATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTC
GGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAAT
GCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGAC
CCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGAT
GTGATAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACC
AAAGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTAT
CTGTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGA
AAGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATC
GTGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAA
GGGATGACGCACAATCCCACTATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAG
AGGTATTAAAATCTTAATAGGTTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAA
CTCTCTCTCATCTCTCTTAAAGCAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGA
TCGTGCTTCGGCACCAGTACAACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAG
TGCGGCGCCATTAAATAACGTGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTG
GAGGCTGCTGTTCAGCCCCATACATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTAC
TTCTGCTTGACGAGGTATTGTTGCCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCT
AGTATTTTCTTTGAAACAGAGTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATAT
TCTGCCCAAATTTGTCGGGCCCATGGCGAAAAACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTT
GGTTCCTTCTCAGATCTTCGCCGATCGAATCTGCACTGGAATAACATCGTCAAACTCACCACATGTCGTCA
AAACTGCTACTCAAGGGGAGGTCAATGTGACTGGTGTAATACCACTGACAACAACACCCACCAAATCTC
ATTTTGCAAATCTCAAAGGAACAGAAACCAGGGGGAAACTATGCCCAAAATGCCTCAACTGCACAGATC

TGGACGTAGCCTTGGGCAGACCAAAATGCACGGGGAAAATACCCTCGGCAAGAGTTTCAATACTCCATG
AAGTCAGACCTGTTACATCTGGGTGCTTTCCTATAATGCACGACAGAACAAAAATTAGACAGCTGCCTAA
CCTTCTCCGAGGATACGAACATATCAGGTTATCAACCCATAACGTTATCAATGCAGAAAATGCACCAGGA
GGACCCTACAAAATTGGAACCTCAGGGTCTTGCCCTAACATTACCAATGGAAACGGATTTTTCGCAACAA
TGGCTTGGGCCGTCCCAAAAAACGACAAAAACAAAACAGCAACAAATCCATTAACAATAGAAGTACCAT
ACATTTGTACAGAAGGAGAAGACCAAATTACCGTTTGGGGGTTCCACTCTGACAACGAGACCCAAATGG
CAAAGCTCTATGGGGACTCAAAGCCCCAGAAGTTCACCTCATCTGCCAACGGAGTGACCACACATTACGT
TTCACAGATTGGTGGCTTCCCAAATCAAACAGAAGACGGAGGACTACCACAAAGTGGTAGAATTGTTGTT
GATTACATGGTGCAAAAATCTGGGAAAACAGGAACAATTACCTATCAAAGGGGTATTTTATTGCCTCAAA
AGGTGTGGTGCGCAAGTGGCAGGAGCAAGGTAATAAAAGGATCCTTGCCTTTAATTGGAGAAGCAGATT
GCCTCCACGAAAAATACGGTGGATTAAACAAAAGCAAGCCTTACTACACAGGGGAACATGCAAAGGCCA
TAGGAAATTGCCCAATATGGGTGAAAACACCCTTGAAGCTGGCCAATGGAACCAAATATAGACCTCCTG
GTGGAGGATGGGAAGGAATGATTGCAGGTTGGCACGGATACACATCCCATGGGGCACATGGAGTAGCGG
TGGCAGCAGACCTTAAGAGCACTCAAGAGGCCATAAACAAGATAACAAAAAATCTCAACTCTTTGAGTG
AGCTGGAAGTAAAGAATCTTCAAAGACTAAGCGGTGCCATGGATGAACTCCACAACGAAATACTAGAAC
TAGATGAGAAAGTGGATGATCTCAGAGCTGATACAATAAGCTCACAAATAGAACTCGCAGTCCTGCTTTC
CAATGAAGGAATAATAAACAGTGAAGATGAACATCTCTTGGCGCTTGAAAGAAAGCTGAAGAAAATGCT
GGGCCCCTCTGCTGTAGAGATAGGGAATGGATGCTTTGAAACCAAACACAAGTGCAACCAGACCTGTCTC
GACAGAATAGCTGCTGGTACCTTTGATGCAGGAGAATTTTCTCTCCCCACCTTTGATTCACTGAATATTAC
TGCTGCATCTTTAAATGACGATGGATTGGATAATCATACTATACTGCTTTACTACTCAACTGCTGCCTCCA
GTTTGGCTGTAACACTGATGATAGCTATCTTTGTTGTTTATATGGTCTCCAGAGACAATGTTTCTTGCTCC
ATCTGTCTATAAAGGCCTATTTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGA
GCGGTTTTCTGTGCTCAGAGTGTGTTTATTTTATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCAGGTC
GTCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTATTAAAAAAAAAAAAAAAAAAAGACCGGGAATTC
GATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCAATAAAGTTTCTTAAGATTGAATCCTGTT
GCCGGTCTTGCGATGATTATCATATAATTTCTGTTGAATTACGTTAAGCATGTAATAATTAACATGTAATG
CATGACGTTATTTATGAGATGGGTTTTTATGATTAGAGTCCCGCAATTATACATTTAATACGCGATAGAAA
ACAAAATATAGCGCGCAAACTAGGATAAATTATCGCGCGCGGTGTCATCTATGTTACTAGATCTCTAGAG
TCTCAAGCTTGGCGCGGGGTACCGAGCTCGAATTCCGAGTGTACTTCAAGTCAGTTGGAAATCAATAAAA
TGATTATTTTATGAATATATTTCATTGTGCAAGTAGATAGAAATTACATATGTTACATAACACACGAAATA
AACAAAAAAACACAATCCAAAACAAACACCCCAAACAAAATAACACTATATATATCCTCGTATGAGGAG
AGGCACGTTCAGTGACTCGACGATTCCCGAGCAAAAAAAGTCTCCCCGTCACACATATAGTGGGTGACG
CAATTATCTTCAAAGTAATCCTTCTGTTGACTTGTCATTGATAACATCCAGTCTTCGTCAGGATTGCAAAG
AATTATAGAAGGGATCCCACCTTTTATTTTCTTCTTTTTTCCATATTTAGGGTTGACAGTGAAATCAGACT
GGCAACCTATTAATTGCTTCCACAATGGGACGAACTTGAAGGGGATGTCGTCGATGATATTATAGGTGGC
GTGTTCATCGTAGTTGGTGAAGTCGATGGTCCCGTTCCAGTAGTTGTGTCGCCCGAGACTTCTAGCCCAGG
TGGTCTTTCCGGTACGAGTTGGTCCGCAGATGTAGAGGCTGGGGTGTCTGACCCCAGTCCTTCCCTCATCC
TGGTTAGATCGGCCATCCACTCAAGGTCAGATTGTGCTTGATCGTAGGAGACAGGATGTATGAAAGTGTA
GGCATCGATGCTTACATGATATAGGTGCGTCTCTCTCCAGTTGTGCAGATCTTCGTGGCAGCGGAGATCT
GATTCTGTGAAGGGCGACACGTACTGCTCAGGTTGTGGAGGAAATAATTTGTTGGCTGAATATTCCAGCC
ATTGAAGCTTTGTTGCCCATTCATGAGGGAATTCTTCTTTGATCATGTCAAGATACTCCTCCTTAGACGTT
GCAGTCTGGATAATAGTTCGCCATCGTGCGTCAGATTTGCGAGGAGAGACCTTATGATCTCGGAAATCTC
CTCTGGTTTTAATATCTCCGTCCTTTGATATGTAATCAAGGACTTGTTTAGAGTTTCTAGCTGGCTGGATAT
TAGGGTGATTTCCTTCAAAATCGAAAAAAGAAGGATCCCTAATACAAGGTTTTTTATCAAGCTGGATAAG
AGCATGATAGTGGGTAGTGCCATCTTGATGAAGCTCAGAAGCAACACCAAGGAAGAAAATAAGAAAAG
GTGTGAGTTTCTCCCAGAGAAACTGGAATAAATCATCTCTTTGAGATGAGCACTTGGGGTAGGTAAGGAA
AACATATTTAGATTGGAGTCTGAAGTTCTTGCTAGCAGAAGGCATGTTGTTGTGACTCCGAGGGGTTGCC
TCAAACTCTATCTTATAACCGGCGTGGAGGCATGGAGGCAAGGGCATTTTGGTAATTTAAGTAGTTAGTG
GAAAATGACGTCATTTACTTAAAGACGAAGTCTTGCGACAAGGGGGGCCCACGCCGAATTTTAATATTAC
CGGCGTGGCCCCACCTTATCGCGAGTGCTTTAGCACGAGCGGTCCAGATTTAAAGTAGAAAAGTTCCCGC
CCACTAGGGTTAAAGGTGTTCACACTATAAAAGCATATACGATGTGATGGTATTTGATGGAGCGTATATT
GTATCAGGTATTTCCGTCGGATACGAATTATTCGTAC

Figure 8D

Amino acid sequence of PDISP/HA from influenza B/Brisbane/60/2008 with deleted proteolytic loop (SEQ ID NO: 41)

MAKNVAIFGLLFSLLVLVPSQIFADRICTGITSSNSPHVVKTATQGEVNVTGVIPLTTTPTK
SHFANLKGTETRGKLCPKCLNCTDLDVALGRPKCTGKIPSARVSILHEVRPVTSGCFPIM
HDRTKIRQLPNLLRGYEHIRLSTHNVINAENAPGGPYKIGTSGSCPNITNGNGFFATMAW
AVPKNDKNKTATNPLTIEVPYICTEGEDQITVWGFHSDNETQMAKLYGDSKPQKFTSSA
NGVTTHYVSQIGGFPNQTEDGGLPQSGRIVVDYMVQKSGKTGTITYQRGILLPQKVWCA
SGRSKVIKGSLPLIGEADCLHEKYGGLNKSKPYYTGEHAKAIGNCPIWVKTPLKLANGTK
YRPPGGGWEGMIAGWHGYTSHGAHGVAVAADLKSTQEAINKITKNLNSLSELEVKNLQ
RLSGAMDELHNEILELDEKVDDLRADTISSQIELAVLLSNEGIINSEDEHLLALERKLKKM
LGPSAVEIGNGCFETKHKCNQTCLDRIAAGTFDAGEFSLPTFDSLNITAASLNDDGLDNH
TILLYYSTAASSLAVTLMIAIFVVYMVSRDNVSCSICL

Figure 8E nucleotide sequence of PDISP/HA from influenza B/Brisbane/60/2008 with deleted proteolytic loop (SEQ ID NO: 43)

ATGGCGAAAAACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTTGGTTCCTTCTCAGATCTTCGCC
GATCGAATCTGCACTGGAATAACATCGTCAAACTCACCACATGTCGTCAAAACTGCTACTCAAGGGGAGG
TCAATGTGACTGGTGTAATACCACTGACAACAACACCCACCAAATCTCATTTTGCAAATCTCAAAGGAAC
AGAAACCAGGGGGAAACTATGCCCAAAATGCCTCAACTGCACAGATCTGGACGTAGCCTTGGGCAGACC
AAAATGCACGGGGAAAATACCCTCGGCAAGAGTTTCAATACTCCATGAAGTCAGACCTGTTACATCTGGG
TGCTTTCCTATAATGCACGACAGAACAAAAATTAGACAGCTGCCTAACCTTCTCCGAGGATACGAACATA
TCAGGTTATCAACCCATAACGTTATCAATGCAGAAAATGCACCAGGAGGACCCTACAAAATTGGAACCTC
AGGGTCTTGCCCTAACATTACCAATGGAAACGGATTTTTCGCAACAATGGCTTGGGCCGTCCCAAAAAAC
GACAAAAACAAAACAGCAACAAATCCATTAACAATAGAAGTACCATACATTTGTACAGAAGGAGAAGAC
CAAATTACCGTTTGGGGGTTCCACTCTGACAACGAGACCCAAATGGCAAAGCTCTATGGGGACTCAAAGC
CCCAGAAGTTCACCTCATCTGCCAACGGAGTGACCACACATTACGTTTCACAGATTGGTGGCTTCCCAAA
TCAAACAGAAGACGGAGGACTACCACAAAGTGGTAGAATTGTTGTTGATTACATGGTGCAAAAATCTGG
GAAAACAGGAACAATTACCTATCAAAGGGGTATTTTATTGCCTCAAAAGGTGTGGTGCGCAAGTGGCAG
GAGCAAGGTAATAAAAGGATCCTTGCCTTTAATTGGAGAAGCAGATTGCCTCCACGAAAAATACGGTGG
ATTAAACAAAAGCAAGCCTTACTACACAGGGGAACATGCAAAGGCCATAGGAAATTGCCCAATATGGGT
GAAAACACCCTTGAAGCTGGCCAATGGAACCAAATATAGACCTCCTGGTGGAGGATGGGAAGGAATGAT
TGCAGGTTGGCACGGATACACATCCCATGGGGCACATGGAGTAGCGGTGGCAGCAGACCTTAAGAGCAC
TCAAGAGGCCATAAACAAGATAACAAAAAATCTCAACTCTTTGAGTGAGCTGGAAGTAAAGAATCTTCA
AAGACTAAGCGGTGCCATGGATGAACTCCACAACGAAATACTAGAACTAGATGAGAAAGTGGATGATCT
CAGAGCTGATACAATAAGCTCACAAATAGAACTCGCAGTCCTGCTTTCCAATGAAGGAATAATAAACAG
TGAAGATGAACATCTCTTGGCGCTTGAAAGAAAGCTGAAGAAAATGCTGGGCCCCTCTGCTGTAGAGAT
AGGGAATGGATGCTTTGAAACCAAACACAAGTGCAACCAGACCTGTCTCGACAGAATAGCTGCTGGTAC
CTTTGATGCAGGAGAATTTTCTCTCCCCACCTTTGATTCACTGAATATTACTGCTGCATCTTTAAATGACG
ATGGATTGGATAATCATACTATACTGCTTTACTACTCAACTGCTGCCTCCAGTTTGGCTGTAACACTGATG
ATAGCTATCTTTGTTGTTTATATGGTCTCCAGAGACAATGTTTCTTGCTCCATCTGTCTATAA

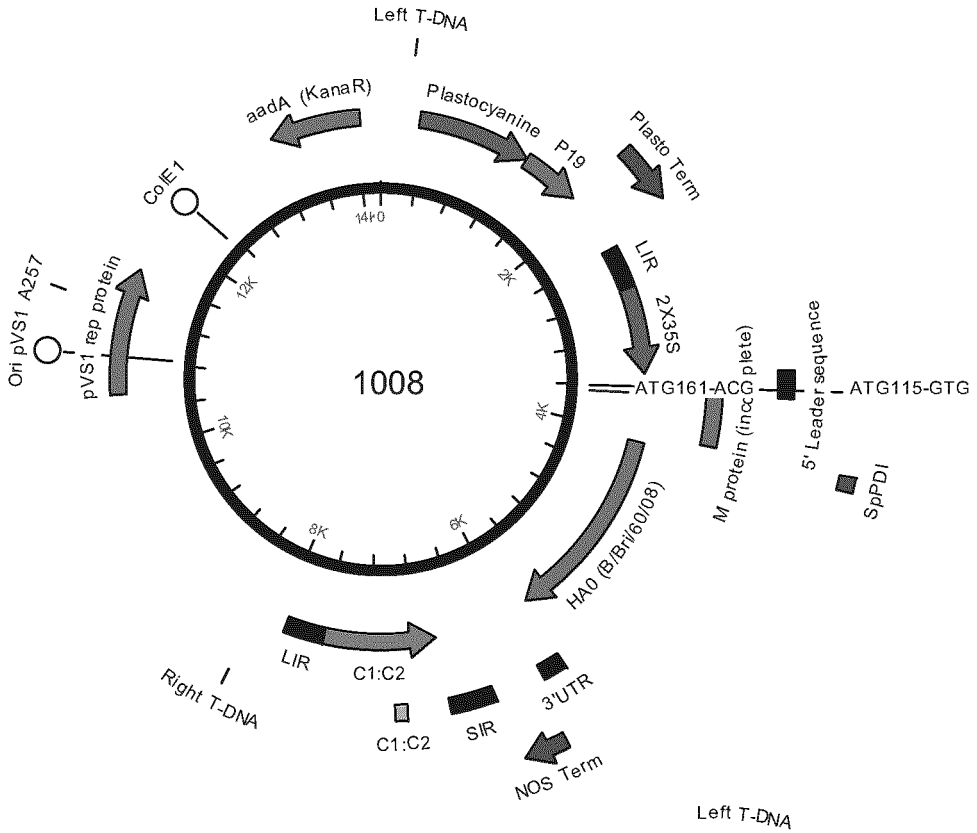


Figure 9

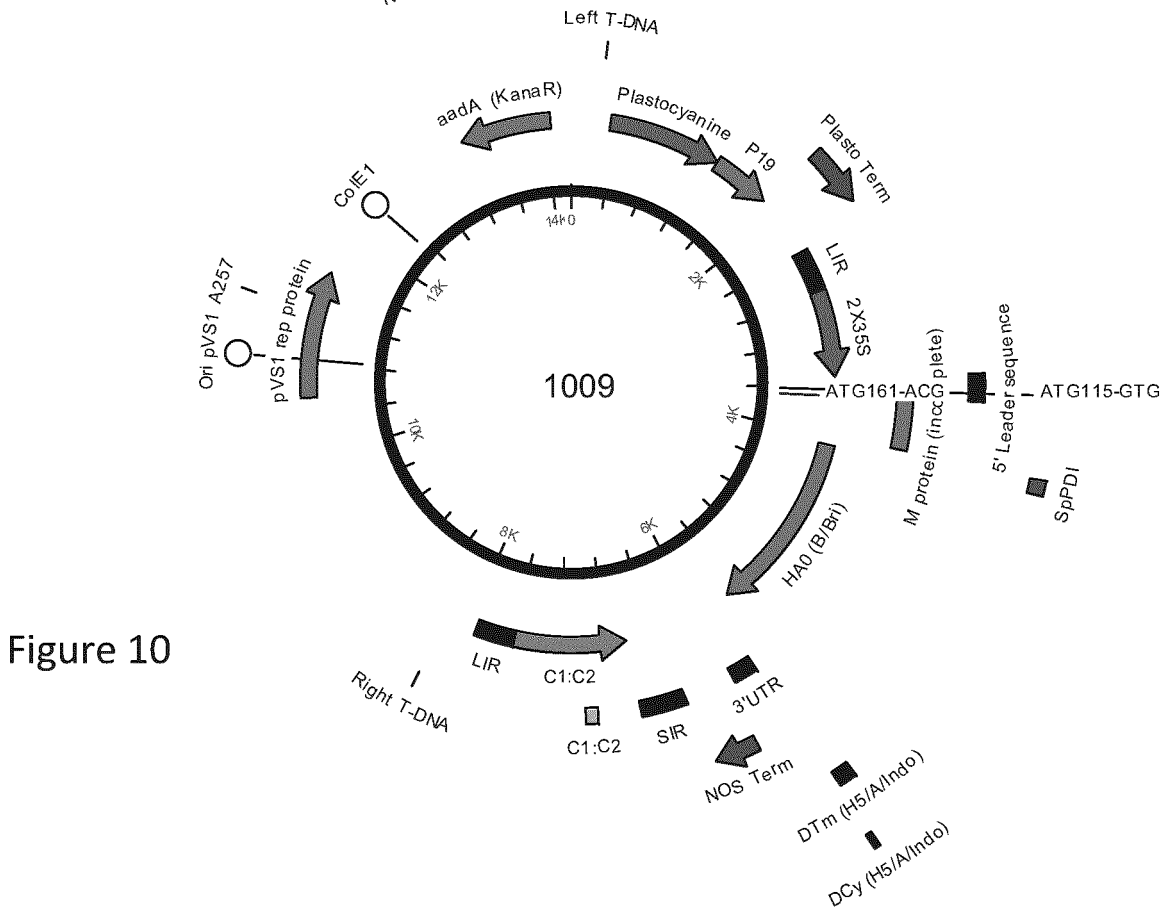


Figure 10

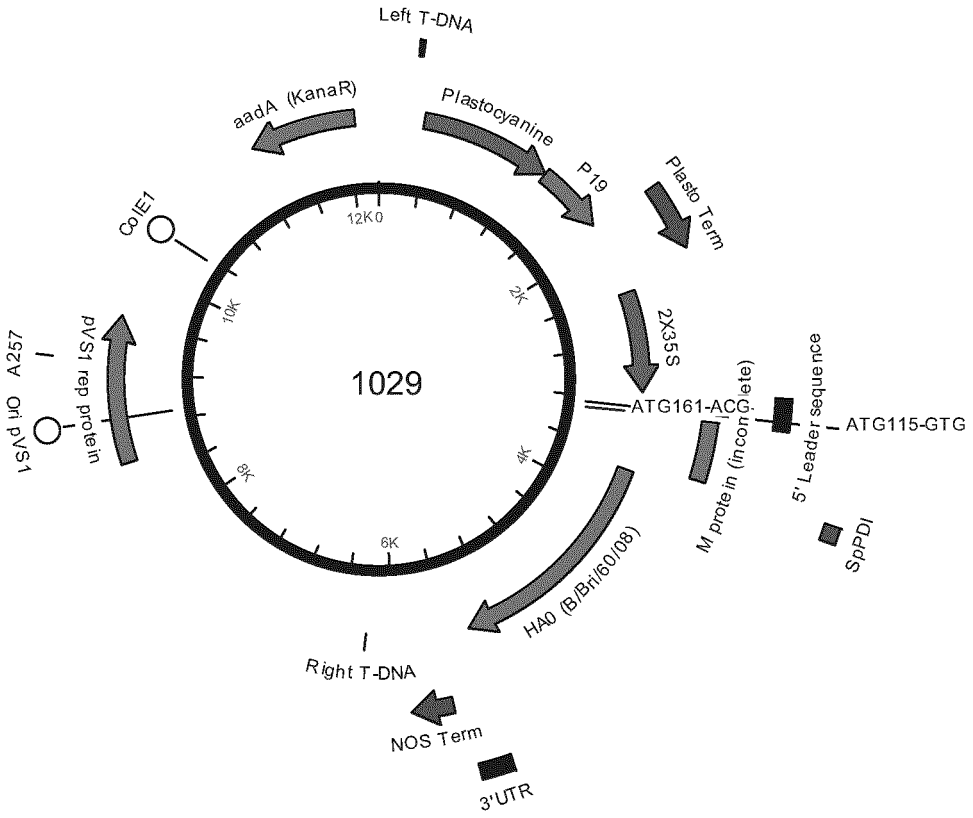


Figure 11

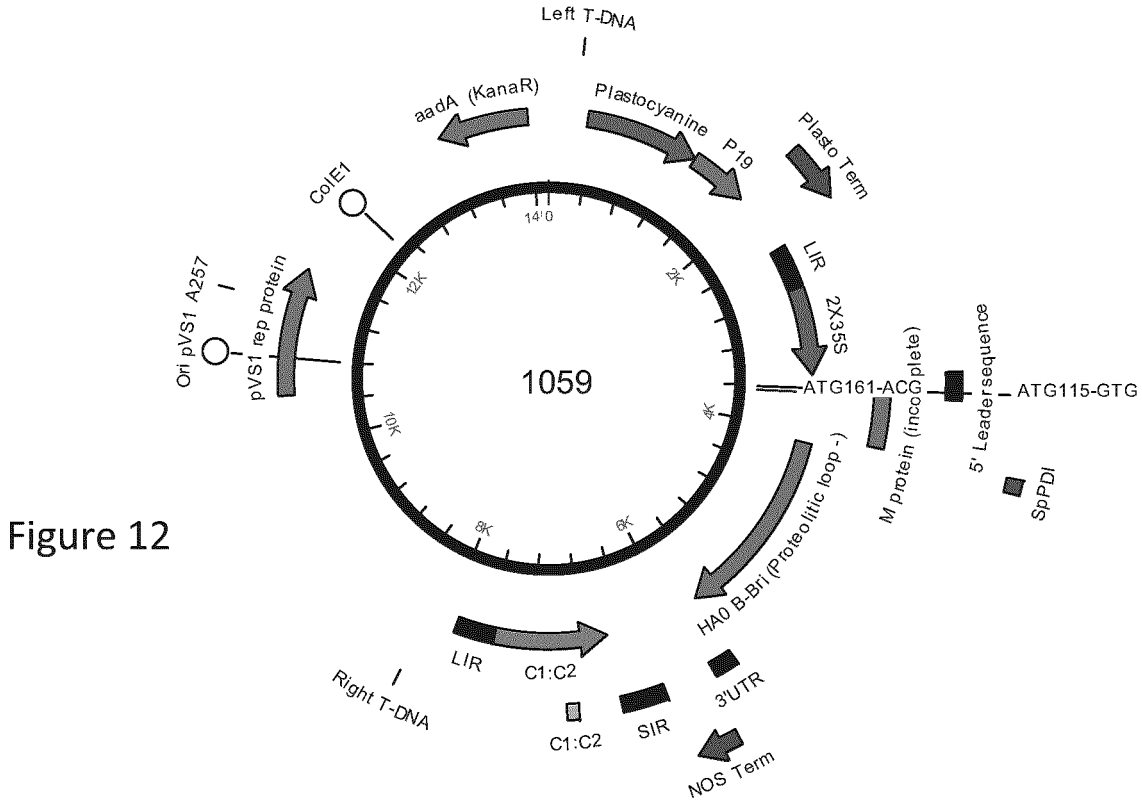


Figure 12

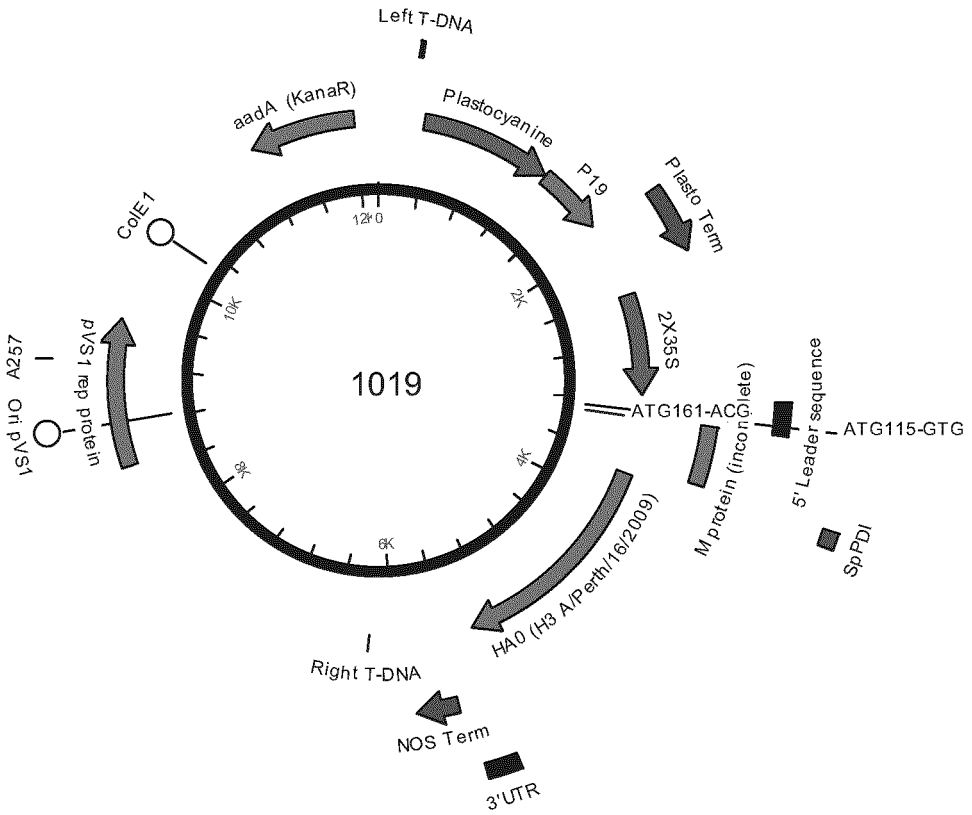


Figure 13

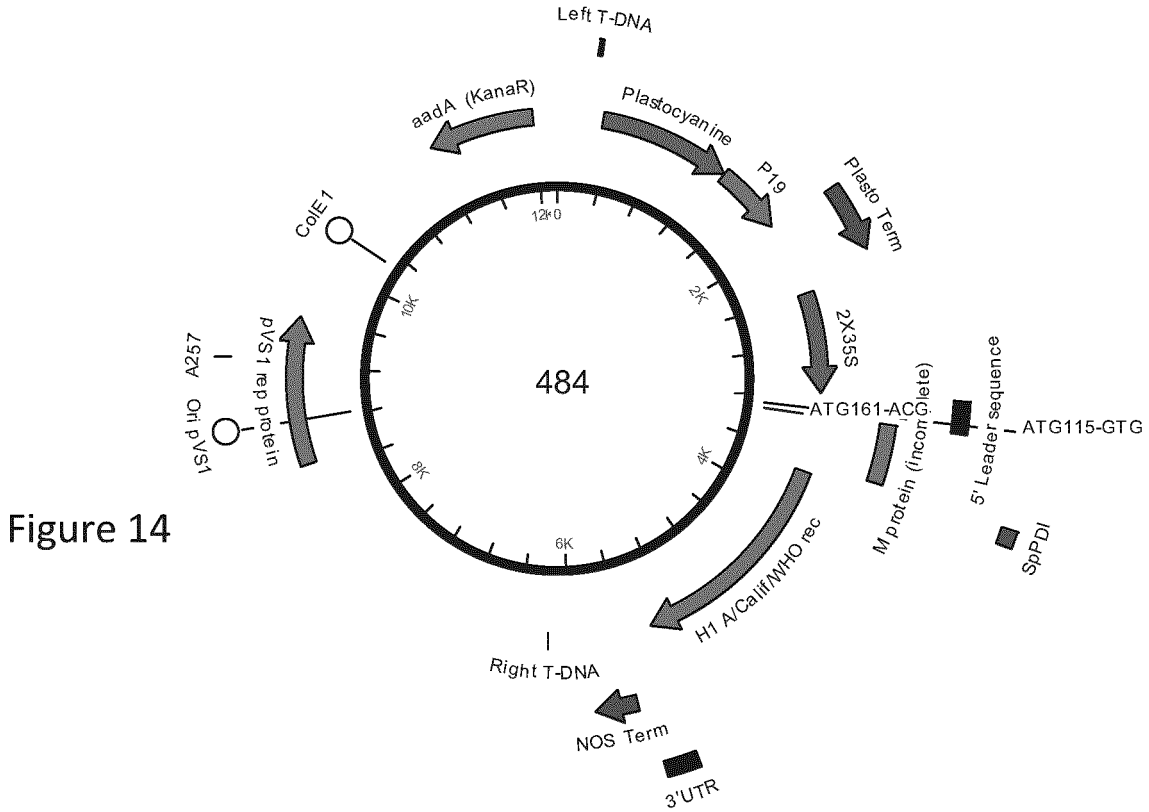


Figure 14

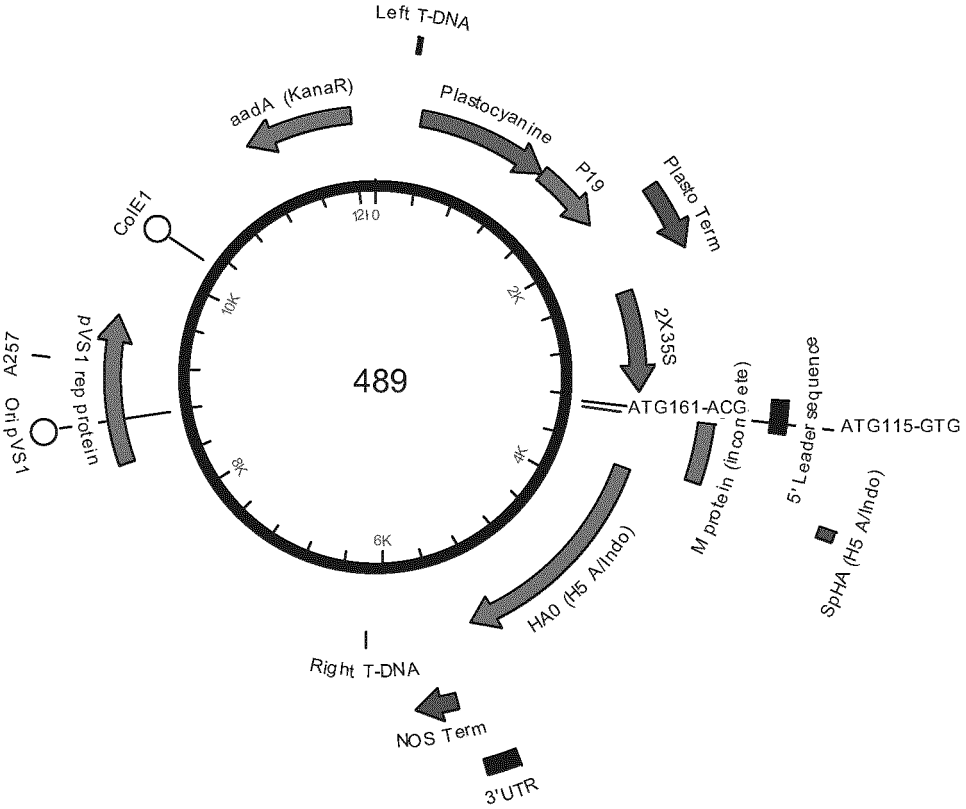

Left T-DNA
aadA (KanaR)
Plastocyanine
P19
Plasto Term
2X35S
ATG161-ACG
ATG115-GTG
5' Leader sequence
M protein (incomplete)
SpHA (H5 A/Indo)
HA0 (H5 A/Indo)
Right T-DNA
NOS Term
3'UTR
ColE1
pVS1 rep protein
Ori pVS1
A257
489
12K
2K
4K
6K
8K
10K

Figure 15

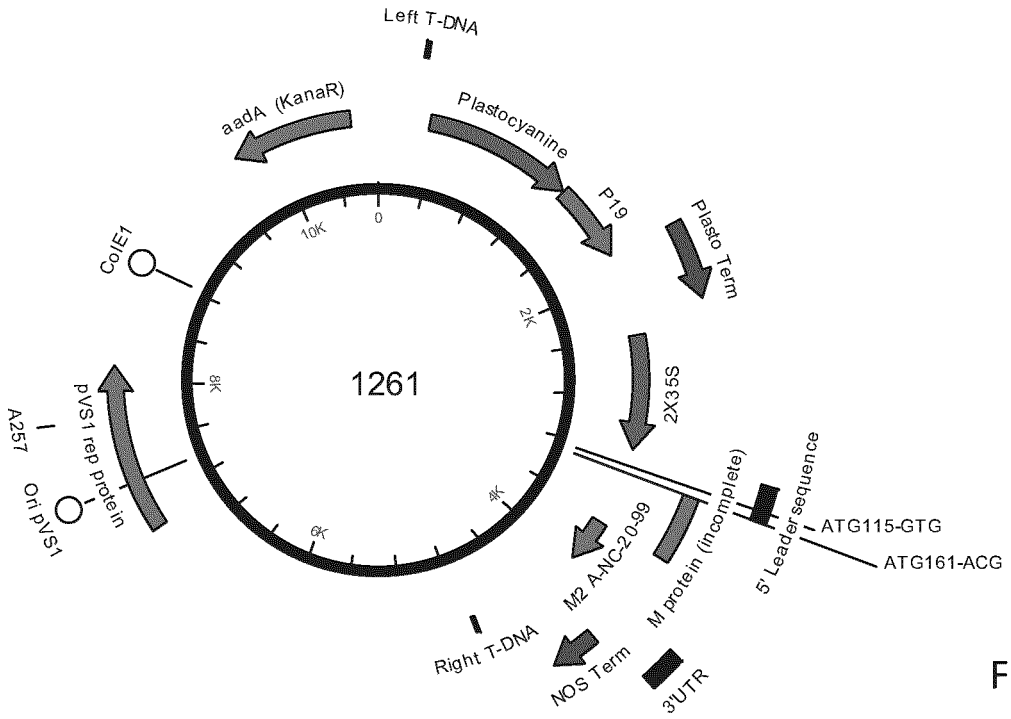


Figure 16

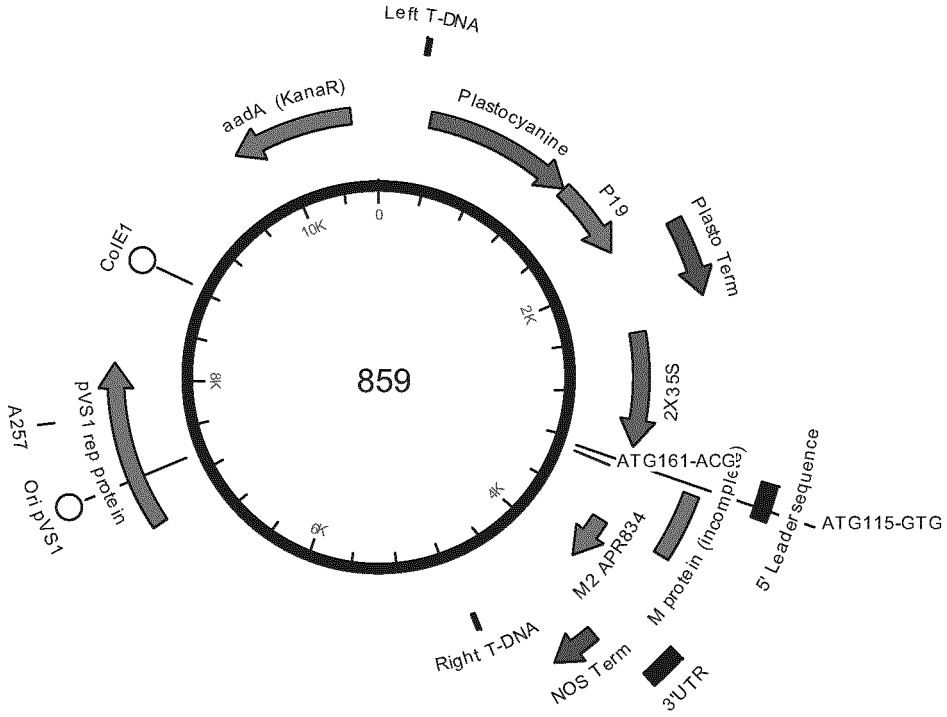


Figure 17

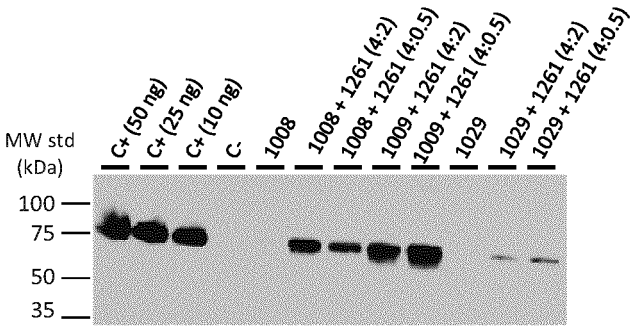

MW std
(kDa)
100
75
50
35
C+ (50 ng)
C+ (25 ng)
C+ (10 ng)
C-
1008
1008 + 1261 (4:2)
1008 + 1261 (4:0.5)
1009 + 1261 (4:2)
1009 + 1261 (4:0.5)
1029
1029 + 1261 (4:2)
1029 + 1261 (4:0.5)

Figure 18

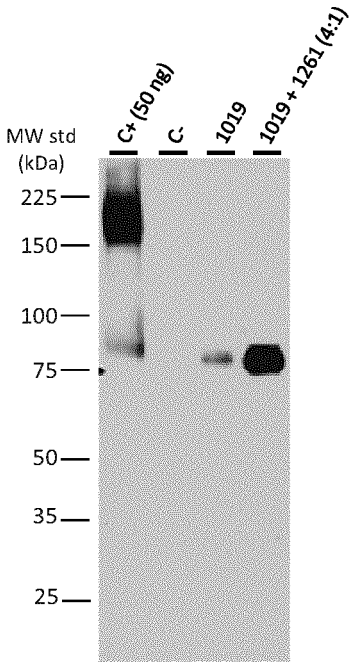


Figure 19

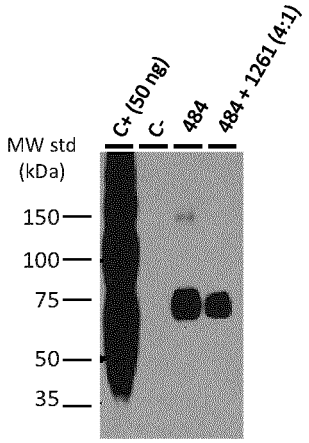


Figure 20

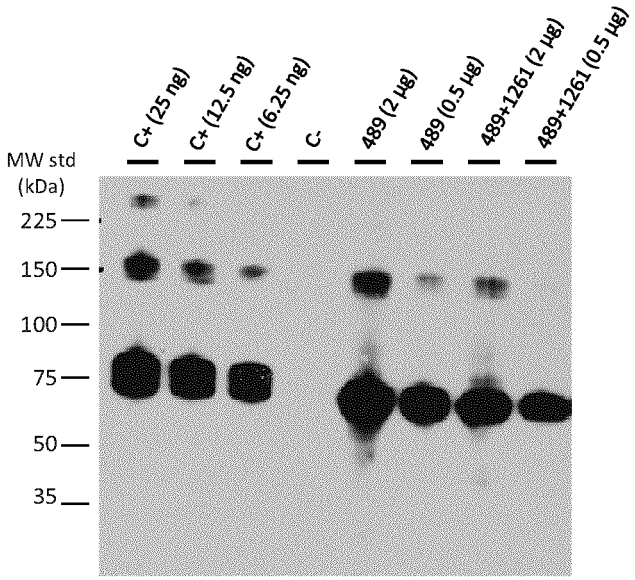

C+ (25 ng)
C+ (12.5 ng)
C+ (6.25 ng)
C-
489 (2 µg)
489 (0.5 µg)
489+1261 (2 µg)
489+1261 (0.5 µg)
MW std
(kDa)
225
150
100
75
50
35

Figure 21

Figure 22A.

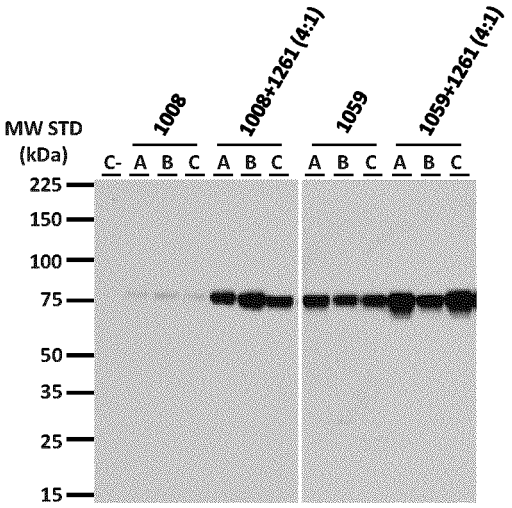


Figure 22B.

Construct number	Hemagglutination capacity (HA units / mg protein)[a]
1008	533
1008 + 1261 (4:1)	3200
1059	4267
1059 + 1261 (4:1)	34133

[a] Inverse of the smallest amount of total protein required for positive hemagglutination reaction in a final volume of 200 µl.

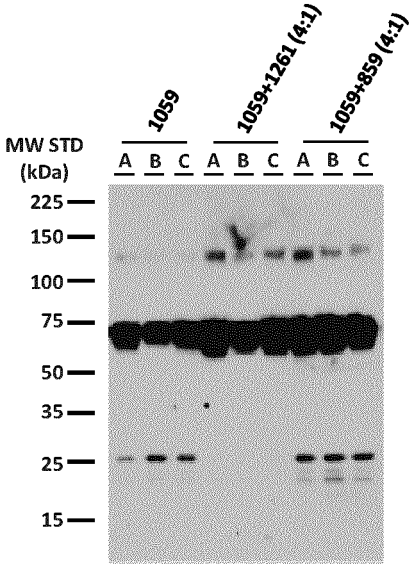


Figure 23A.

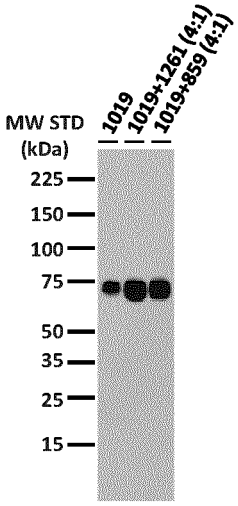


Figure 23B.

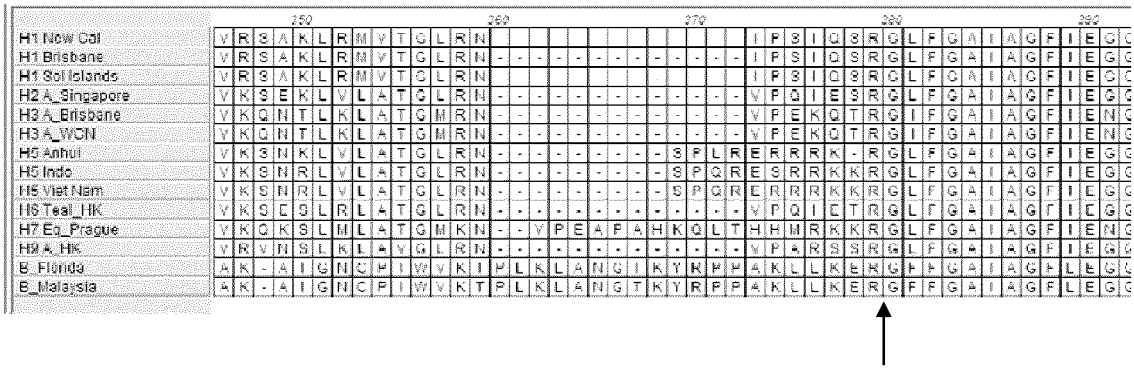

250
260
270
280
290
H1 New Cal
H1 Brisbane
H1 Sol Islands
H2 A_Singapore
H3 A_Brisbane
H3 A_WON
H5 Anhui
H5 Indo
H5 Viet Nam
H6 Teal_HK
H7 Eq_Prague
H9 A_HK
B_Florida
B_Malaysia

Figure 24

A-2X35S/CPMV-HT/PDISP/H3 Victoria/NOS (Construct number 1391)

Figure 25A, SEQ ID NO: 44

IF-H3V36111.S2+4c

TCTCAGATCTTCGCCCAAAAACTTCCTGGAAATGACAACAGCACGGCA

Figure 25B, SEQ ID NO: 45

IF-H3V36111.s1-4r

ACTAAAGAAAATAGGCCTTCAAATGCAAATGTTGCACCTAATGTTGCCCTT

Figure 25C, SEQ ID NO: 46

Synthesized H3 gene (corresponding to nt 25 to 1725 from GISAID isolate number EPI_ISL_101506 HA sequence)

ATGAAGACTATCATTGCTTTGAGCCACATTCTATGTCTGGTTTTCGCTCAAAAACTTCCTGGAAATGACAA
CAGCACGGCAACGCTGTGCCTTGGGCACCATGCAGTACCAAACGGAACGATAGTGAAAACAATCACGAA
TGACCAAATTGAAGTTACTAATGCTACTGAGCTGGTTCAGAATTCCTCAATAGGTGAAATATGCGACAGT
CCTCATCAGATCCTTGATGGAGAAAACTGCACACTAATAGATGCTCTATTGGGAGACCCTCAGTGTGATG
GCTTCCAAAATAAGAAATGGGACCTTTTTGTTGAACGAAGCAAAGCCTACAGCAACTGTTACCCTTATGA
TGTGCCGGATTATGCCTCCCTTAGGTCACTAGTTGCCTCATCCGGCACACTGGAGTTTAACAATGAAAGCT
TCAATTGGACTGGAGTCACTCAAAACGGAACAAGTTCTGCTTGCATAAGGAGATCTAATAATAGTTTCTT
TAGTAGATTAAATTGGTTGACCCACTTAAACTTCAAATACCCAGCATTGAACGTGACTATGCCAAACAAT
GAACAATTTGACAAATTGTACATTTGGGGGGTTCACCACCCGGGTACGGACAAGGACCAAATCTTCCTGT
ATGCTCAATCATCAGGAAGAATCACAGTATCTACCAAAAGAAGCCAACAAGCTGTAATCCCGAATATCG
GATCTAGACCCAGAATAAGGAATATCCCTAGCAGAATAAGCATCTATTGGACAATAGTAAAACCGGGAG
ACATACTTTTGATTAACAGCACAGGGAATCTAATTGCTCCTAGGGGTTACTTCAAAATACGAAGTGGGAA
AAGCTCAATAATGAGATCAGATGCACCCATTGGCAAATGCAATTCTGAATGCATCACTCCAAATGGAAGC
ATTCCCAATGACAAACCATTCCAAAATGTAAACAGGATCACATACGGGGCCTGTCCCAGATATGTTAAGC
AAAGCACTCTGAAATTGGCAACAGGAATGCGAAATGTACCAGAGAAACAAACTAGAGGCATATTTGGCG
CAATAGCGGGTTTCATAGAAAATGGTTGGGAGGGAATGGTGGATGGTTGGTACGGTTTCAGGCATCAAA
ATTCTGAGGGAAGAGGACAAGCAGCAGATCTCAAAAGCACTCAAGCAGCAATCGATCAAATCAATGGGA
AGCTGAATCGATTGATCGGGAAAACCAACGAGAAATTCCATCAGATTGAAAAAGAATTCTCAGAAGTCG
AAGGGAGAATTCAGGACCTTGAGAAATATGTTGAGGACACTAAAATAGATCTCTGGTCATACAACGCGG
AGCTTCTTGTTGCCCTGGAGAACCAACATACAATTGATCTAACTGACTCAGAAATGAACAAACTGTTTGA
AAAAACAAAGAAGCAACTAAGGGAAAATGCTGAGGATATGGGCAATGGTTGTTTCAAAATATACCACAA
ATGTGACAATGCCTGCATAGGATCAATCAGAAATGGAACTTATGACCACGATGTATACAGAGATGAAGC
ATTAAACAACCGGTTCCAGATCAAGGGAGTTGAGCTGAAGTCAGGGTACAAAGATTGGATCCTATGGAT
TTCCTTTGCCATATCATGTTTTTTGCTTTGTGTTGCTTTGTTGGGGTTCATCATGTGGGCCTGCCAAAAGGG
CAACATTAGGTGCAACATTTGCATTTGA

Figure 25D, SEQ ID NO: 47

Expression cassette number 1391 from 2X35S promoter to NOS terminator. PDISP/H3 from influenza A/Victoria/361/2011 (H3N2) is underlined.

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAA
AGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCT
GTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAA
AGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCG
TGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACG
ACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCA
ACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATA
GTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCC
TCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCA
ACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCACAATCCCACT
ATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGG
TTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAG
CAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACA
ACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACG
TGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCA
TACATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTG
TTGCCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGA
GTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGC
CCATGGCGAAAAACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTTGGTTCCTTCTCAGATCTTCG
CCCAAAAACTTCCTGGAAATGACAACAGCACGGCAACGCTGTGCCTTGGGCACCATGCAGTACCAAACG
GAACGATAGTGAAAACAATCACGAATGACCAAATTGAAGTTACTAATGCTACTGAGCTGGTTCAGAATTC
CTCAATAGGTGAAATATGCGACAGTCCTCATCAGATCCTTGATGGAGAAAACTGCACACTAATAGATGCT
CTATTGGGAGACCCTCAGTGTGATGGCTTCCAAAATAAGAAATGGGACCTTTTTGTTGAACGAAGCAAAG
CCTACAGCAACTGTTACCCTTATGATGTGCCGGATTATGCCTCCCTTAGGTCACTAGTTGCCTCATCCGGC
ACACTGGAGTTTAACAATGAAAGCTTCAATTGGACTGGAGTCACTCAAAACGGAACAAGTTCTGCTTGCA
TAAGGAGATCTAATAATAGTTTCTTTAGTAGATTAAATTGGTTGACCCACTTAAACTTCAAATACCCAGC
ATTGAACGTGACTATGCCAAACAATGAACAATTTGACAAATTGTACATTTGGGGGGTTCACCACCCGGGT
ACGGACAAGGACCAAATCTTCCTGTATGCTCAATCATCAGGAAGAATCACAGTATCTACCAAAAGAAGC
CAACAAGCTGTAATCCCGAATATCGGATCTAGACCCAGAATAAGGAATATCCCTAGCAGAATAAGCATC
TATTGGACAATAGTAAAACCGGGAGACATACTTTTGATTAACAGCACAGGGAATCTAATTGCTCCTAGGG
GTTACTTCAAAATACGAAGTGGGAAAAGCTCAATAATGAGATCAGATGCACCCATTGGCAAATGCAATT
CTGAATGCATCACTCCAAATGGAAGCATTCCCAATGACAAACCATTCCAAAATGTAAACAGGATCACATA
CGGGGCCTGTCCCAGATATGTTAAGCAAAGCACTCTGAAATTGGCAACAGGAATGCGAAATGTACCAGA
GAAACAAACTAGAGGCATATTTGGCGCAATAGCGGGTTTCATAGAAAATGGTTGGGAGGGAATGGTGGA
TGGTTGGTACGGTTTCAGGCATCAAAATTCTGAGGGAAGAGGACAAGCAGCAGATCTCAAAAGCACTCA
AGCAGCAATCGATCAAATCAATGGGAAGCTGAATCGATTGATCGGGAAAACCAACGAGAAATTCCATCA
GATTGAAAAAGAATTCTCAGAAGTCGAAGGGAGAATTCAGGACCTTGAGAAATATGTTGAGGACACTAA
AATAGATCTCTGGTCATACAACGCGGAGCTTCTTGTTGCCCTGGAGAACCAACATACAATTGATCTAACT
GACTCAGAAATGAACAAACTGTTTGAAAAAACAAAGAAGCAACTAAGGGAAAATGCTGAGGATATGGG
CAATGGTTGTTTCAAAATATACCACAAATGTGACAATGCCTGCATAGGATCAATCAGAAATGGAACTTAT
GACCACGATGTATACAGAGATGAAGCATTAAACAACCGGTTCCAGATCAAGGGAGTTGAGCTGAAGTCA
GGGTACAAAGATTGGATCCTATGGATTTCCTTTGCCATATCATGTTTTTTGCTTTGTGTTGCTTTGTTGGGG
TTCATCATGTGGGCCTGCCAAAAGGGCAACATTAGGTGCAACATTTGCATTTGAAGGCCTATTTTCTTTAG
TTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTAT
TTTATGTAATTTAATTTCTTTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATT
TTAATTTTATTAAAAAAAAAAAAAAAAAAGACCGGGAATTCGATATCAAGCTTATCGACCTGCAGATCGT
TCAAACATTTGGCAATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATTATCATATAATT
TCTGTTGAATTACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTA

TGATTAGAGTCCCGCAATTATACATTTAATACGCGATAGAAAACAAAATATAGCGCGCAAACTAGGATA
AATTATCGCGCGCGGTGTCATCTATGTTACTAGAT

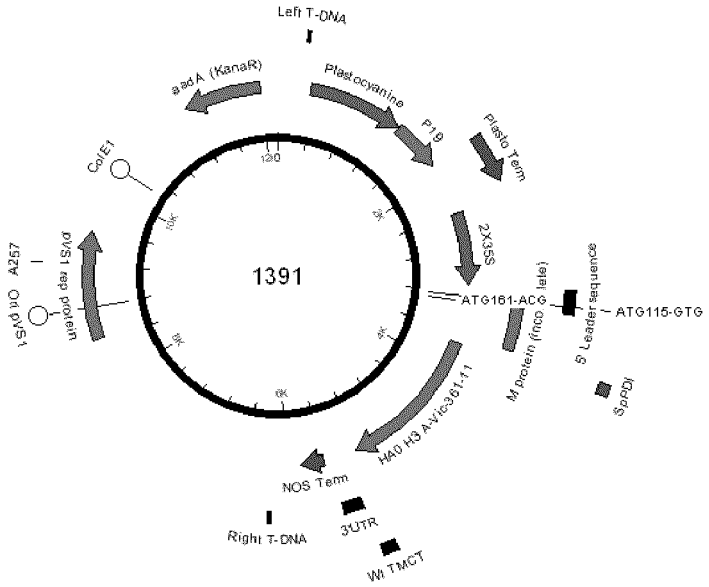
Figure 25E, SEQ ID NO: 48

Amino acid sequence of PDISP-H3 from influenza A/ Victoria/361/2011 (H3N2)

MAKNVAIFGLLFSLLVLVPSQIFAQKLPGNDNSTATLCLGHHAVPNGTIVKTITNDQIEVT
NATELVQNSSIGEICDSPHQILDGENCTLIDALLGDPQCDGFQNKKWDLFVERSKAYSNC
YPYDVPDYASLRSLVASSGTLEFNNESFNWTGVTQNGTSSACIRRSNNSFFSRLNWLTHL
NFKYPALNVTMPNNEQFDKLYIWGVHHPGTDKDQIFLYAQSSGRITVSTKRSQQAVIPNI
GSRPRIRNIPSRISIYWTIVKPGDILLINSTGNLIAPRGYFKIRSGKSSIMRSDAPIGKCNSECI
TPNGSIPNDKPFQNVNRITYGACPRYVKQSTLKLATGMRNVPEKQTRGIFGAIAGFIENG
WEGMVDGWYGFRHQNSEGRGQAADLKSTQAAIDQINGKLNRLIGKTNEKFHQIEKEFS
EVEGRIQDLEKYVEDTKIDLWSYNAELLVALENQHTIDLTDSEMNKLFEKTKKQLRENA
EDMGNGCFKIYHKCDNACIGSIRNGTYDHDVYRDEALNNRFQIKGVELKSGYKDWILWI
SFAISCFLLCVALLGFIMWACQKGNIRCNICI*

Figure 25F

Schematic representation of construct number 1391



B-2X35S/CPMV-HT/HA B Wisconsin/NOS into BeYDV(m)+Replicase amplification system (Construct number 1462)

Figure 26A, SEQ ID NO: 49

IF-HAB110.S1+3c

AAATTTGTCGGGCCCATGAAGGCAATAATTGTACTACTCATGGTAG

Figure 26B, SEQ ID NO: 50

IF-HAB110.s1-4r

ACTAAAGAAAATAGGCCTTTATAGACAGATGGAGCATGAAACGTTGTCTCTG

Figure 26C, SEQ ID NO: 51

Synthesized HA B Wisconsin (Genbank accession number JN993010)

ATGAAGGCAATAATTGTACTACTCATGGTAGTAACATCCAATGCAGATCGAATCTGCACTGGGATAACAT
CTTCAAACTCACCTCATGTGGTCAAAACAGCTACTCAAGGGGAGGTCAATGTGACTGGCGTGATACCACT
GACAACAACACCAACAAAATCTTATTTTGCAAATCTCAAAGGAACAAGGACCAGAGGGAAACTATGCCC
GGACTGTCTCAACTGTACAGATCTGGATGTGGCCTTGGGCAGGCCAATGTGTGTGGGGACCACACCTTCT
GCTAAAGCTTCAATACTCCACGAGGTCAGACCTGTTACATCCGGGTGCTTTCCTATAATGCACGACAGAA
CAAAAATCAGGCAACTACCCAATCTTCTCAGAGGATATGAAAATATCAGGTTATCAACCCAAAACGTTAT
CGATGCAGAAAAAGCACCAGGAGGACCCTACAGACTTGGAACCTCAGGATCTTGCCCTAACGCTACCAG
TAAAATCGGATTTTTTGCAACAATGGCTTGGGCTGTCCCAAAGGACAACTACAAAAATGCAACGAACCCA
CTAACAGTAGAAGTACCATACATTTGTACAGAAGGGGAAGACCAAATTACTGTTTGGGGGTTCCATTCAG
ATAACAAAACCCAAATGAAGAGCCTCTATGGAGACTCAAATCCTCAAAAGTTCACCTCATCTGCTAATGG
AGTAACCACACATTATGTTTCTCAGATTGGCGACTTCCCAGATCAAACAGAAGACGGAGGACTACCACAA
AGCGGCAGAATTGTTGTTGATTACATGATGCAAAAACCTGGGAAAACAGGAACAATTGTCTATCAAAGA
GGTGTTTTGTTGCCTCAAAAGGTGTGGTGCGCGAGTGGCAGGAGCAAAGTAATAAAAGGGTCATTGCCTT
TAATTGGTGAAGCAGATTGCCTTCATGAAAAATACGGTGGATTAAACAAAAGCAAGCCTTACTACACAG
GAGAACATGCAAAAGCCATAGGAAATTGCCCAATATGGGTAAAAACACCTTTGAAGCTTGCCAATGGAA
CCAAATATAGACCTCCTGCAAAACTATTGAAGGAAAGGGGTTTCTTCGGAGCTATTGCTGGTTTCCTAGA
AGGAGGATGGGAAGGAATGATTGCAGGTTGGCACGGATACACATCTCACGGAGCACATGGAGTGGCAGT
GGCGGCAGACCTTAAGAGTACACAAGAAGCTATAAATAAGATAACAAAAAATCTCAATTCTTTGAGTGA
GCTAGAAGTAAAGAACCTTCAAAGACTAAGTGGTGCCATGGATGAACTCCACAACGAAATACTCGAGCT
GGATGAGAAAGTGGATGATCTCAGAGCTGACACTATAAGCTCACAAATAGAACTTGCAGTCTTGCTTTCC
AACGAAGGAATAATAAACAGTGAAGACGAGCATCTATTGGCACTTGAGAGAAAACTAAAGAAAATGCTG
GGTCCCTCTGCTGTAGACATAGGAAACGGATGCTTCGAAACCAAACACAAATGCAACCAGACCTGCTTA
GACAGGATAGCTGCTGGCACCTTTAATGCAGGAGAATTTTCTCTCCCCACTTTTGATTCATTGAACATTAC
TGCTGCATCTTTAAATGATGATGGATTGGATAACCATACTATACTGCTCTATTACTCAACTGCTGCTTCTA
GTTTGGCTGTAACATTAATGCTAGCTATTTTTATTGTTTATATGGTCTCCAGAGACAACGTTTCATGCTCC
ATCTGTCTATAA

Figure 26D

Schematic representation of construct 193. SacII and StuI restriction enzyme sites used for plasmid linearization are annotated on the representation.

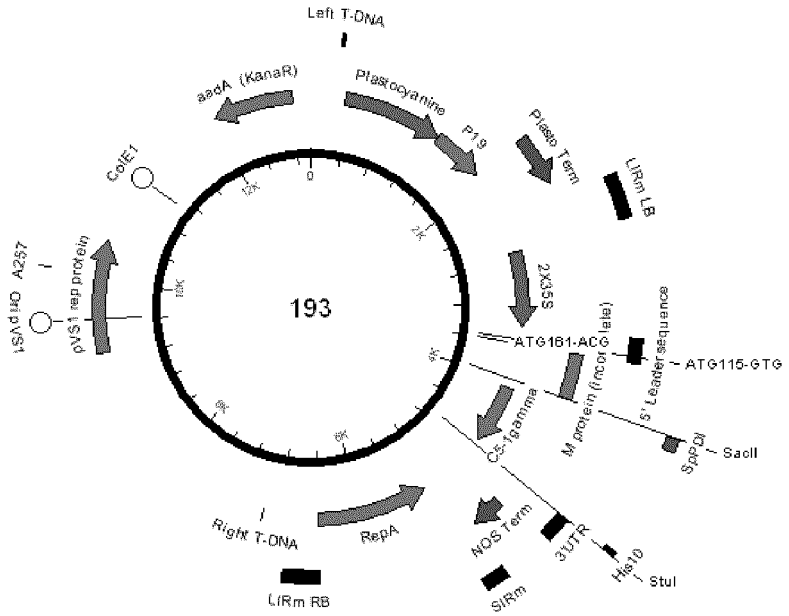


Figure 26E, SEQ ID NO: 52

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

TGGCAGGATATATTGTGGTGTAAACAAATTGACGCTTAGACAACTTAATAACACATTGCGGACGTTTTTA
ATGTACTGAATTAACGCCGAATCCCGGGCTGGTATATTTATATGTTGTCAAATAACTCAAAAACCATAAA
AGTTTAAGTTAGCAAGTGTGTACATTTTTACTTGAACAAAAATATTCACCTACTACTGTTATAAATCATTA
TTAAACATTAGAGTAAAGAAATATGGATGATAAGAACAAGAGTAGTGATATTTTGACAACAATTTTGTTG
CAACATTTGAGAAAATTTTGTTGTTCTCTCTTTTCATTGGTCAAAAACAATAGAGAGAGAAAAAGGAAGA
GGGAGAATAAAAACATAATGTGAGTATGAGAGAGAAAGTTGTACAAAAGTTGTACCAAAATAGTTGTAC
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TGTATTAGTAATTAGAATTTGGTGTCAAATTTAATTTGACATTTGATCTTTTCCTATATATTGCCCCATAGA
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ACATCCAATCCAACCAATCACAACAATCCTGATGAGATAACCCACTTTAAGCCCACGCATCTGTGGCACA
TCTACATTATCTAAATCACACATTCTTCCACACATCTGAGCCACACAAAAACCAATCCACATCTTTATCAC
CCATTCTATAAAAAATCACACTTTGTGAGTCTACACTTTGATTCCCTTCAAACACATACAAAGAGAAGAG
ACTAATTAATTAATTAATCATCTTGAGAGAAAATGGAACGAGCTATACAAGGAAACGACGCTAGGGAAC

AAGCTAACAGTGAACGTTGGGATGGAGGATCAGGAGGTACCACTTCTCCCTTCAAACTTCCTGACGAAAG
TCCGAGTTGGACTGAGTGGCGGCTACATAACGATGAGACGAATTCGAATCAAGATAATCCCCTTGGTTTC
AAGGAAAGCTGGGGTTTCGGGAAAGTTGTATTTAAGAGATATCTCAGATACGACAGGACGGAAGCTTCA
CTGCACAGAGTCCTTGGATCTTGGACGGGAGATTCGGTTAACTATGCAGCATCTCGATTTTTCGGTTTCGA
CCAGATCGGATGTACCTATAGTATTCGGTTTCGAGGAGTTAGTATCACCGTTTCTGGAGGGTCGCGAACT
CTTCAGCATCTCTGTGAGATGGCAATTCGGTCTAAGCAAGAACTGCTACAGCTTGCCCCAATCGAAGTGG
AAAGTAATGTATCAAGAGGATGCCCTGAAGGTACTCAAACCTTCGAAAAAGAAAGCGAGTAAGTTAAAA
TGCTTCTTCGTCTCCTATTTATAATATGGTTTGTTATTGTTAATTTTGTTCTTGTAGAAGAGCTTAATTAAT
CGTTGTTGTTATGAAATACTATTTGTATGAGATGAACTGGTGTAATGTAATTCATTTACATAAGTGGAGTC
AGAATCAGAATGTTTCCTCCATAACTAACTAGACATGAAGACCTGCCGCGTACAATTGTCTTATATTTGA
ACAACTAAAATTGAACATCTTTTGCCACAACTTTATAAGTGGTTAATATAGCTCAAATATATGGTCAAGTT
CAATAGATTAATAATGGAAATATCAGTTATCGAAATTCATTAACAATCAACTTAACGTTATTAACTACTA
ATTTTATATCATCCCCTTTGATAAATGATAGTACACCAATTAGGAAGGAGCATGCTCGCCTAGGAGATTG
TCGTTTCCCGCCTTCAGTTTGCAAGCTGCTCTAGCCGTGTAGCCAATACGCAAACCGCCTCTCCCCGCGCG
TTGGGAATTACTAGCGCGTGTCGAGACGCGTTGTTGTTGTGACTCCGAGGGGTTGCCTCAAACTCTATCTT
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TTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGGTTTT
GATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAGCAA
ACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACAACG
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ACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCATAC
ATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTGTTG
CCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGAGTT
TTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGCCCG
CGGATGGCGAAAAACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTTGGTTCCTTCTCAGATCTTC
GCCTGCAGGCTCCTCAGCCAAAACGACACCCCCATCTGTCTATCCACTGGCCCCTGGATCTGCTGCCCAA
ACTAACTCCATGGTGACCCTGGGATGCCTGGTCAAGGGCTATTTCCCTGAGCCAGTGACAGTGACCTGGA
ACTCTGGATCCCTGTCCAGCGGTGTGCACACCTTCCCAGCTGTCCTGCAGTCTGACCTCTACACTCTGAGC
AGCTCAGTGACTGTCCCCTCCAGCACCTGGCCCAGCGAGACCGTCACCTGCAACGTTGCCCACCCGGCCA
GCAGCACCAAGGTGGACAAGAAAATTGTGCCCAGGGATTGTGGTTGTAAGCCTTGCATATGTACAGTCCC
AGAAGTATCATCTGTCTTCATCTTCCCCCCAAAGCCCAAGGATGTGCTCACCATTACTCTGACTCCTAAGG
TCACGTGTGTTGTGGTAGACATCAGCAAGGATGATCCCGAGGTCCAGTTCAGCTGGTTTGTAGATGATGT
GGAGGTGCACACAGCTCAGACGCAACCCCGGGAGGAGCAGTTCAACAGCACTTTCCGCTCAGTCAGTGA
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ATCACCATTAAAGGCCTATTTTCTTTAGTTTGAATTTACTGTTATTCGGTGTGCATTTCTATGTTTGGTGAG
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TTTTGGTCATTTTAATAGATAGTGGAAAATGACGTGGAATTTACTTAAAGACGAAGTCTTTGCGACAAGG
GGGGGCCCACGCCGAATTTAATATTACCGGCGTGGCCCCCCCTTATCGCGAGTGCTTTAGCACGAGCGGT
CCAGATTTAAAGTAGAAAATTTCCCGCCCACTAGGGTTAAAGGTGTTCACACTATAAAAGCATATACGAT
GTGATGGTATTTGACTAGTGGCACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACCCTGGCGTTAC
CCAACTTAATCGCCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGAT
CGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGCTAGAGCAGCTTGAGCTTGGATCAGATTGTCG
TTTCCCGCCTTCAGTTTAAACTATCAGTGTTTGACAGGATATATTGGCGGGTAAACCTAAGAGAAAAGAG
CGTTTA

Figure 26F, SEQ ID NO: 53

Expression cassette number 1462 from 2X35S promoter to NOS terminator. HA from influenza B/Wisconsin/1/2010 is underlined.

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAA
AGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCT
GTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAA
AGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCG
TGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACG
ACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCA
ACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATA
GTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCC
TCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCA
ACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCACAATCCCACT
ATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGG
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TACATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTG
TTGCCTGTACTTCTTTCTTCTTCTTCTTGCTGATTGGTTCTATAAGAAATCTAGTATTTTCTTTGAAACAGA
GTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGC
CCATGAAGGCAATAATTGTACTACTCATGGTAGTAACATCCAATGCAGATCGAATCTGCACTGGGATAAC

ATCTTCAAACTCACCTCATGTGGTCAAAACAGCTACTCAAGGGGAGGTCAATGTGACTGGCGTGATACCA
CTGACAACAACACCAACAAAATCTTATTTTGCAAATCTCAAAGGAACAAGGACCAGAGGGAAACTATGC
CCGGACTGTCTCAACTGTACAGATCTGGATGTGGCCTTGGGCAGGCCAATGTGTGTGGGGACCACACCTT
CTGCTAAAGCTTCAATACTCCACGAGGTCAGACCTGTTACATCCGGGTGCTTTCCTATAATGCACGACAG
AACAAAAATCAGGCAACTACCCAATCTTCTCAGAGGATATGAAAATATCAGGTTATCAACCCAAAACGTT
ATCGATGCAGAAAAAGCACCAGGAGGACCCTACAGACTTGGAACCTCAGGATCTTGCCCTAACGCTACC
AGTAAAATCGGATTTTTTGCAACAATGGCTTGGGCTGTCCCAAAGGACAACTACAAAAATGCAACGAAC
CCACTAACAGTAGAAGTACCATACATTTGTACAGAAGGGGAAGACCAAATTACTGTTTGGGGGTTCCATT
CAGATAACAAAACCCAAATGAAGAGCCTCTATGGAGACTCAAATCCTCAAAAGTTCACCTCATCTGCTAA
TGGAGTAACCACACATTATGTTTCTCAGATTGGCGACTTCCCAGATCAAACAGAAGACGGAGGACTACCA
CAAAGCGGCAGAATTGTTGTTGATTACATGATGCAAAAACCTGGGAAAACAGGAACAATTGTCTATCAA
AGAGGTGTTTTGTTGCCTCAAAAGGTGTGGTGCGCGAGTGGCAGGAGCAAAGTAATAAAAGGGTCATTG
CCTTTAATTGGTGAAGCAGATTGCCTTCATGAAAAATACGGTGGATTAAACAAAAGCAAGCCTTACTACA
CAGGAGAACATGCAAAAGCCATAGGAAATTGCCCAATATGGGTAAAAACACCTTTGAAGCTTGCCAATG
GAACCAAATATAGACCTCCTGCAAAACTATTGAAGGAAAGGGGTTTCTTCGGAGCTATTGCTGGTTTCCT
AGAAGGAGGATGGGAAGGAATGATTGCAGGTTGGCACGGATACACATCTCACGGAGCACATGGAGTGGC
AGTGGCGGCAGACCTTAAGAGTACACAAGAAGCTATAAATAAGATAACAAAAAATCTCAATTCTTTGAG
TGAGCTAGAAGTAAAGAACCTTCAAAGACTAAGTGGTGCCATGGATGAACTCCACAACGAAATACTCGA
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TTAGACAGGATAGCTGCTGGCACCTTTAATGCAGGAGAATTTTCTCTCCCCACTTTTGATTCATTGAACAT
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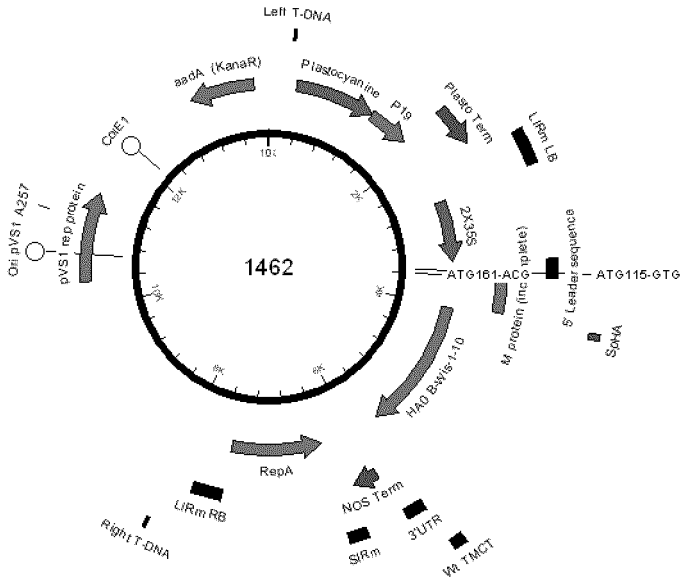
Figure 26G, SEQ ID NO: 54

Amino acid sequence of HA from influenza B/Wisconsin/1/2010

MKAIIVLLMVVTSNADRICTGITSSNSPHVVKTATQGEVNVTGVIPLTTTPTKSYFANLKGTRTRGKLCPDCLN
CTDLDVALGRPMCVGTTPSAKASILHEVRPVTSGCFPIMHDRTKIRQLPNLLRGYENIRLSTQNVIDAEKAPGG
PYRLGTSGSCPNATSKIGFFATMAWAVPKDNYKNATNPLTVEVPYICTEGEDQITVWGFHSDNKTQMKSLYG
DSNPQKFTSSANGVTTHYVSQIGDFPDQTEDGGLPQSGRIVVDYMMQKPGKTGTIVYQRGVLLPQKVWCASG
RSKVIKGSLPLIGEADCLHEKYGGLNKSKPYYTGEHAKAIGNCPIWVKTPLKLANGTKYRPPAKLLKERGFFG
AIAGFLEGGWEGMIAGWHGYTSHGAHGVAVAADLKSTQEAINKITKNLNSLSELEVKNLQRLSGAMDELHN
EILELDEKVDDLRADTISSQIELAVLLSNEGIINSEDEHLLALERKLKKMLGPSAVDIGNGCFETKHKCNQTCLD
RIAAGTFNAGEFSLPTFDSLNITAASLNDDGLDNHTILLYYSTAASSLAVTLMLAIFIVYMVSRDNVSCSICL*

Figure 26H

Schematic representation of construct number 1462



C-2X35S/CPMV-HT/HA B Wisconsin with deleted proteolytic loop/NOS into BeYDV(m)+Replicase amplification system (Construct number 1467)

Figure 27A, SEQ ID NO: 55

HAB110(PrL-).r

TCCTTCCCATCCTCCACCAGGAGGTCTATATTTGGTTCCATTGGCAAGCTTCAAAG

Figure 27B, SEQ ID NO: 56

HAB110(PrL-).c

ATATAGACCTCCTGGTGGAGGATGGGAAGGAATGATTGCAGGTTGGCACGGA

Figure 27C, SEQ ID NO: 57

Expression cassette number 1467 from 2X35S promoter to NOS terminator. HA from influenza B/Wisconsin/1/2010 with deleted proteolytic loop is underlined.

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAA
AGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCT
GTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAA

AGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCG
TGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACG
ACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCA
ACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATA
GTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCC
TCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCA
ACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCACAATCCCACT
ATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGG
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CAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACA
ACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACG
TGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCA
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GTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGC
CCATGAAGGCAATAATTGTACTACTCATGGTAGTAACATCCAATGCAGATCGAATCTGCACTGGGATAAC
ATCTTCAAACTCACCTCATGTGGTCAAAACAGCTACTCAAGGGGAGGTCAATGTGACTGGCGTGATACCA
CTGACAACAACACCAACAAAATCTTATTTTGCAAATCTCAAAGGAACAAGGACCAGAGGGAAACTATGC
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CTGCTAAAGCTTCAATACTCCACGAGGTCAGACCTGTTACATCCGGGTGCTTTCCTATAATGCACGACAG
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ATCGATGCAGAAAAAGCACCAGGAGGACCCTACAGACTTGGAACCTCAGGATCTTGCCCTAACGCTACC
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CAGATAACAAAACCCAAATGAAGAGCCTCTATGGAGACTCAAATCCTCAAAAGTTCACCTCATCTGCTAA
TGGAGTAACCACACATTATGTTTCTCAGATTGGCGACTTCCCAGATCAAACAGAAGACGGAGGACTACCA
CAAAGCGGCAGAATTGTTGTTGATTACATGATGCAAAAACCTGGGAAAACAGGAACAATTGTCTATCAA
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CCTTTAATTGGTGAAGCAGATTGCCTTCATGAAAAATACGGTGGATTAAACAAAAGCAAGCCTTACTACA
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CCAGAGACAACGTTTCATGCTCCATCTGTCTATAAAGGCCTATTTTCTTTAGTTTGAATTTACTGTTATTCG
GTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTTATGTAATTTAATTTCTT
TGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTATTAAAAAAAA
AAAAAAAAAAGACCGGGAATTCGATATCAAGCTTATCGACCTGCAGATCGTTCAAACATTTGGCAATAA
AGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATTATCATATAATTTCTGTTGAATTACGTTAA
GCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTATGATTAGAGTCCCGCAAT
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CATCTATGTTACTAGAT

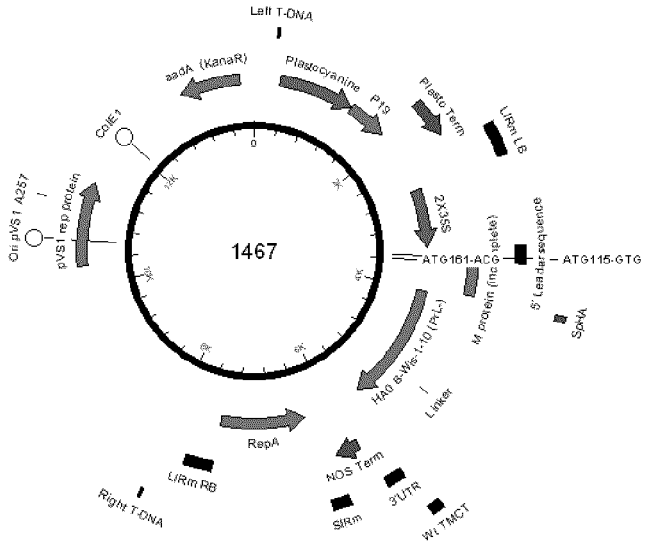
Figure 27D, SEQ ID NO: 58

Amino acid sequence of HA from influenza B/Wisconsin/1/2010 with deleted proteolytic loop

MKAIIVLLMVVTSNADRICTGITSSNSPHVVKTATQGEVNVTGVIPLTTTPTKSYFANLKG
TRTRGKLCPDCLNCTDLDVALGRPMCVGTTPSAKASILHEVRPVTSGCFPIMHDRTKIRQ
LPNLLRGYENIRLSTQNVIDAEKAPGGPYRLGTSGSCPNATSKIGFFATMAWAVPKDNY
KNATNPLTVEVPYICTEGEDQITVWGFHSDNKTQMKSLYGDSNPQKFTSSANGVTTHYV
SQIGDFPDQTEDGGLPQSGRIVVDYMMQKPGKTGTIVYQRGVLLPQKVWCASGRSKVIK
GSLPLIGEADCLHEKYGGLNKSKPYYTGEHAKAIGNCPIWVKTPLKLANGTKYRPPGGG
WEGMIAGWHGYTSHGAHGVAVAADLKSTQEAINKITKNLNSLSELEVKNLQRLSGAMD
ELHNEILELDEKVDDLRADTISSQIELAVLLSNEGIINSEDEHLLALERKLKKMLGPSAVDI
GNGCFETKHKCNQTCLDRIAAGTFNAGEFSLPTFDSLNITAASLNDDGLDNHTILLYYST
AASSLAVTLMLAIFIVYMVSRDNVSCSICL*

Figure 27E

Schematic representation of construct number 1467



D-2X35S/CPMV-HT/PDISP/HA B Malaysia/NOS into BeYDV(m)+Replicase amplification system (Construct number 1631)

Figure 28A, SEQ ID NO: 59

IF-HB-M-04.s2+4c

TCTCAGATCTTCGCCGATCGAATCTGCACTGGGATAACATCGTC

Figure 28B, SEQ ID NO: 60

IF-HB-M-04.s1-4r

ACTAAAGAAAATAGGCCTTTATAGACAGATGGAGCAAGAAACATTG

Figure 28C, SEQ ID NO: 61

Synthesized HA B Malaysia (corresponding to nt 31-1743 from Genbank accession number EU124275). T759C and C888G mutations are underlined.

GATCGAATCTGCACTGGGATAACATCGTCAAACTCACCACATGTTGTCAAAACTGCTACTCAAGGGGAGG
TCAATGTGACTGGTGTAATACCACTGACAACAACACCCACCAAATCTCATTTTGCAAATCTCAAAGGAAC
AGAAACCAGAGGGAAACTATGCCCAAAATGCCTCAACTGCACAGATCTGGACGTGGCCTTGGGCAGACC
AAAATGCACGGGGAACATACCCTCGGCAAGAGTTTCAATACTCCATGAAGTCAGACCTGTTACATCTGGG
TGCTTTCCTATAATGCACGACAGAACAAAAATTAGACAGCTGCCTAAACTTCTCAGAGGATACGAACATA
TCAGGTTATCAACTCATAACGTTATCAATGCAGAAAATGCACCAGGAGGACCCTACAAAATTGGAACCTC
AGGGTCTTGCCCTAACGTTACCAATGGAAACGGATTTTTCGCAACAATGGCTTGGGCCGTCCCAAAAAAC
GACAACAACAAAACAGCAACAAATTCATTAACAATAGAAGTACCATACATTTGTACAGAAGGAGAAGAC
CAAATTACCGTTTGGGGGTTCCACTCTGATAACGAAACCCAAATGGCAAAGCTCTATGGGGACTCAAAGC
CCCAGAAGTTCACCTCATCTGCCAACGGAGTGACCACACATTACGTTTCACAGATTGGTGGCTTCCCAAA
TCAAACAGAAGACGGAGGACTACCACAAAGCGGTAGAATTGTTGTTGATTACATGGTGCAAAAATCTGG
GAAAACAGGAACAATTACCTATCAAAGAGGTATTTTATTGCCTCAAAAAGTGTGGTGCGCAAGTGGCAG
GAGCAAGGTAATAAAAGGATCGTTGCCTTTAATTGGAGAAGCAGATTGCCTCCACGAAAAATACGGTGG
ATTAAACAAAAGCAAGCCTTACTACACAGGGGAACATGCAAAGGCCATAGGAAATTGCCCAATATGGGT
GAAAACACCCTTGAAGCTGGCCAATGGAACCAAATATAGACCTCCTGCAAAACTATTAAAGGAAAGGGG
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ACATCCCATGGGGCACATGGAGTAGCGGTGGCAGCAGACCTTAAGAGCACTCAAGAGGCCATAAACAAG
ATAACAAAAAATCTCAACTCTTTGAGTGAGCTGGAAGTAAAGAATCTTCAAAGACTAAGCGGTGCCATG
GATGAACTCCACAACGAAATACTAGAACTAGACGAGAAAGTGGATGATCTCAGAGCTGATACAATAAGC
TCACAAATAGAACTCGCAGTCCTGCTTTCCAATGAAGGAATAATAAACAGTGAAGATGAGCATCTCTTGG
CGCTTGAAAGAAAGCTGAAGAAAATGCTGGGCCCCTCTGCTGTAGAGATAGGGAATGGATGCTTTGAAA
CCAAACACAAGTGCAACCAGACCTGTCTCGACAGAATAGCTGCTGGTACCTTTGATGCAGGAGAATTTTC
TCTCCCCACTTTTGATTCACTGAATATTACTGCTGCATCTTTAAATGACGATGGATTGGATAATCATACTA
TACTGCTTTACTACTCAACTGCTGCCTCCAGTTTGGCTGTAACATTGATGATAGCTATCTTTGTTGTTTATA
TGGTCTCCAGAGACAATGTTTCTTGCTCCATCTGTCTATAA

Figure 28D

Schematic representation of construct 194. SacII and StuI restriction enzyme sites used for plasmid linearization are annotated on the representation.

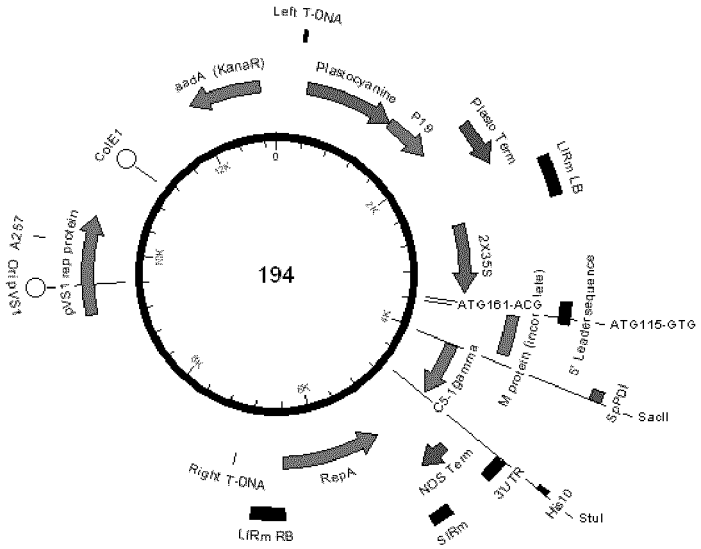


Figure 28E, SEQ ID NO: 62

Construct 194 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

TGGCAGGATATATTGTGGTGTAAACAAATTGACGCTTAGACAACTTAATAACACATTGCGGACGTTTTTA
ATGTACTGAATTAACGCCGAATCCCGGGCTGGTATATTTATATGTTGTCAAATAACTCAAAAACCATAAA
AGTTTAAGTTAGCAAGTGTGTACATTTTTACTTGAACAAAAATATTCACCTACTACTGTTATAAATCATTA
TTAAACATTAGAGTAAAGAAATATGGATGATAAGAACAAGAGTAGTGATATTTTGACAACAATTTTGTTG
CAACATTTGAGAAAATTTTGTTGTTCTCTCTTTTCATTGGTCAAAAACAATAGAGAGAGAAAAAGGAAGA
GGGAGAATAAAAACATAATGTGAGTATGAGAGAGAAAGTTGTACAAAAGTTGTACCAAAATAGTTGTAC
AAATATCATTGAGGAATTTGACAAAAGCTACACAAATAAGGGTTAATTGCTGTAAATAAATAAGGATGA
CGCATTAGAGAGATGTACCATTAGAGAATTTTTGGCAAGTCATTAAAAAGAAAGAATAAATTATTTTTAA
AATTAAAAGTTGAGTCATTTGATTAAACATGTGATTATTTAATGAATTGATGAAAGAGTTGGATTAAAGT
TGTATTAGTAATTAGAATTTGGTGTCAAATTTAATTTGACATTTGATCTTTTCCTATATATTGCCCCATAGA
GTCAGTTAACTCATTTTTATATTTCATAGATCAAATAAGAGAAATAACGGTATATTAATCCCTCCAAAAA
AAAAAAACGGTATATTTACTAAAAAATCTAAGCCACGTAGGAGGATAACAGGATCCCCGTAGGAGGATA
ACATCCAATCCAACCAATCACAACAATCCTGATGAGATAACCCACTTTAAGCCCACGCATCTGTGGCACA
TCTACATTATCTAAATCACACATTCTTCCACACATCTGAGCCACACAAAAACCAATCCACATCTTTATCAC
CCATTCTATAAAAAATCACACTTTGTGAGTCTACACTTTGATTCCCTTCAAACACATACAAAGAGAAGAG
ACTAATTAATTAATTAATCATCTTGAGAGAAAATGGAACGAGCTATACAAGGAAACGACGCTAGGGAAC
AAGCTAACAGTGAACGTTGGGATGGAGGATCAGGAGGTACCACTTCTCCCTTCAAACTTCCTGACGAAAG
TCCGAGTTGGACTGAGTGGCGGCTACATAACGATGAGACGAATTCGAATCAAGATAATCCCCTTGGTTTC
AAGGAAAGCTGGGGTTTCGGGAAAGTTGTATTTAAGAGATATCTCAGATACGACAGGACGGAAGCTTCA
CTGCACAGAGTCCTTGGATCTTGGACGGGAGATTCGGTTAACTATGCAGCATCTCGATTTTTCGGTTTCGA
CCAGATCGGATGTACCTATAGTATTCGGTTTCGAGGAGTTAGTATCACCGTTTCTGGAGGGTCGCGAACT
CTTCAGCATCTCTGTGAGATGGCAATTCGGTCTAAGCAAGAACTGCTACAGCTTGCCCCAATCGAAGTGG
AAAGTAATGTATCAAGAGGATGCCCTGAAGGTACTCAAACCTTCGAAAAAGAAAGCGAGTAAGTTAAAA
TGCTTCTTCGTCTCCTATTTATAATATGGTTTGTTATTGTTAATTTTGTTCTTGTAGAAGAGCTTAATTAAT
CGTTGTTGTTATGAAATACTATTTGTATGAGATGAACTGGTGTAATGTAATTCATTTACATAAGTGGAGTC

AGAATCAGAATGTTTCCTCCATAACTAACTAGACATGAAGACCTGCCGCGTACAATTGTCTTATATTTGA
ACAACTAAAATTGAACATCTTTTGCCACAACTTTATAAGTGGTTAATATAGCTCAAATATATGGTCAAGTT
CAATAGATTAATAATGGAAATATCAGTTATCGAAATTCATTAACAATCAACTTAACGTTATTAACTACTA
ATTTTATATCATCCCCTTTGATAAATGATAGTACACCAATTAGGAAGGAGCATGCTCGCCTAGGAGATTG
TCGTTTCCCGCCTTCAGTTTGCAAGCTGCTCTAGCCGTGTAGCCAATACGCAAACCGCCTCTCCCCGCGCG
TTGGGAATTACTAGCGCGTGTCGAGACGCGTTGTTGTTGTGACTCCGAGGGGTTGCCTCAAACTCTATCTT
ATAACCGGCGTGGAGGCATGGAGGCAGGGGTATTTTGGTCATTTTAATAGATAGTGGAAAATGACGTGG
AATTTACTTAAAGACGAAGTCTTTGCGACAAGGGGGGGCCCACGCCGAATTTAATATTACCGGCGTGGCC
CCCCCTTATCGCGAGTGCTTTAGCACGAGCGGTCCAGATTTAAAGTAGAAAATTTCCCGCCCACTAGGGT
TAAAGGTGTTCACACTATAAAAGCATATACGATGTGATGGTATTTGGTCGACAAGCTTGCATGCCGGTCA
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ATTACTTGTTACGATTCTGCTGACTTTCGGCGGGTGCAATATCTCTACTTCTGCTTGACGAGGTATTGTTG
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CGGCTCCTCAGCCAAAACGACACCCCCATCTGTCTATCCACTGGCCCCTGGATCTGCTGCCCAAACTAAC
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GATCCCTGTCCAGCGGTGTGCACACCTTCCCAGCTGTCCTGCAGTCTGACCTCTACACTCTGAGCAGCTCA
GTGACTGTCCCCTCCAGCACCTGGCCCAGCGAGACCGTCACCTGCAACGTTGCCCACCCGGCCAGCAGCA
CCAAGGTGGACAAGAAAATTGTGCCCAGGGATTGTGGTTGTAAGCCTTGCATATGTACAGTCCCAGAAGT
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GTGTTGTGGTAGACATCAGCAAGGATGATCCCGAGGTCCAGTTCAGCTGGTTTGTAGATGATGTGGAGGT
GCACACAGCTCAGACGCAACCCCGGGAGGAGCAGTTCAACAGCACTTTCCGCTCAGTCAGTGAACTTCCC
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ACATAACACACGAAATAAACAAAAAAAGACAATCCAAAAACAAACACCCCAAAAAAAATAATCACTTT
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TTTTATCAAGCTGGAGAAGAGCATGATAGTGGGTAGTGCCATCTTGATGAAGCTCAGAAGCAACACCAA
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GTGACTCCGAGGGGTTGCCTCAAACTCTATCTTATAACCGGCGTGGAGGCATGGAGGCAGGGGTATTTTG
GTCATTTTAATAGATAGTGGAAAATGACGTGGAATTTACTTAAAGACGAAGTCTTTGCGACAAGGGGGG
GCCCACGCCGAATTTAATATTACCGGCGTGGCCCCCCCTTATCGCGAGTGCTTTAGCACGAGCGGTCCAG
ATTTAAAGTAGAAAATTTCCCGCCCACTAGGGTTAAAGGTGTTCACACTATAAAAGCATATACGATGTGA
TGGTATTTGACTAGTGGCACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACCCTGGCGTTACCCAA
CTTAATCGCCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCC
CTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGCTAGAGCAGCTTGAGCTTGGATCAGATTGTCGTTTC
CCGCCTTCAGTTTAAACTATCAGTGTTTGACAGGATATATTGGCGGGTAAACCTAAGAGAAAAGAGCGTT
TA

Figure 28F, SEQ ID NO: 63

Expression cassette number 1631 from 2X35S promoter to NOS terminator. PDISP-HA from influenza B/ Malaysia/2506/2004 is underlined.

GTCAACATGGTGGAGCACGACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAA
AGGGCAATTGAGACTTTTCAACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCT
GTCACTTTATTGTGAAGATAGTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAA
AGGCCATCGTTGAAGATGCCTCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCG
TGGAAAAAGAAGACGTTCCAACCACGTCTTCAAAGCAAGTGGATTGATGTGATAACATGGTGGAGCACG
ACACACTTGTCTACTCCAAAAATATCAAAGATACAGTCTCAGAAGACCAAAGGGCAATTGAGACTTTTCA
ACAAAGGGTAATATCCGGAAACCTCCTCGGATTCCATTGCCCAGCTATCTGTCACTTTATTGTGAAGATA
GTGGAAAAGGAAGGTGGCTCCTACAAATGCCATCATTGCGATAAAGGAAAGGCCATCGTTGAAGATGCC
TCTGCCGACAGTGGTCCCAAAGATGGACCCCCACCCACGAGGAGCATCGTGGAAAAAGAAGACGTTCCA
ACCACGTCTTCAAAGCAAGTGGATTGATGTGATATCTCCACTGACGTAAGGGATGACGCACAATCCCACT
ATCCTTCGCAAGACCCTTCCTCTATATAAGGAAGTTCATTTCATTTGGAGAGGTATTAAAATCTTAATAGG
TTTTGATAAAAGCGAACGTGGGGAAACCCGAACCAAACCTTCTTCTAAACTCTCTCTCATCTCTCTTAAAG
CAAACTTCTCTCTTGTCTTTCTTGCGTGAGCGATCTTCAACGTTGTCAGATCGTGCTTCGGCACCAGTACA
ACGTTTTCTTTCACTGAAGCGAAATCAAAGATCTCTTTGTGGACACGTAGTGCGGCGCCATTAAATAACG
TGTACTTGTCCTATTCTTGTCGGTGTGGTCTTGGGAAAAGAAAGCTTGCTGGAGGCTGCTGTTCAGCCCCA
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GTTTTCCCGTGGTTTTCGAACTTGGAGAAAGATTGTTAAGCTTCTGTATATTCTGCCCAAATTTGTCGGGC
CCATGGCGAAAAACGTTGCGATTTTCGGCTTATTGTTTTCTCTTCTTGTGTTGGTTCCTTCTCAGATCTTCG
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GGTCAATGTGACTGGTGTAATACCACTGACAACAACACCCACCAAATCTCATTTTGCAAATCTCAAAGGA
ACAGAAACCAGAGGGAAACTATGCCCAAAATGCCTCAACTGCACAGATCTGGACGTGGCCTTGGGCAGA
CCAAAATGCACGGGGAACATACCCTCGGCAAGAGTTTCAATACTCCATGAAGTCAGACCTGTTACATCTG
GGTGCTTTCCTATAATGCACGACAGAACAAAAATTAGACAGCTGCCTAAACTTCTCAGAGGATACGAACA
TATCAGGTTATCAACTCATAACGTTATCAATGCAGAAAATGCACCAGGAGGACCCTACAAAATTGGAACC
TCAGGGTCTTGCCCTAACGTTACCAATGGAAACGGATTTTTCGCAACAATGGCTTGGGCCGTCCCAAAAA
ACGACAACAACAAAACAGCAACAAATTCATTAACAATAGAAGTACCATACATTTGTACAGAAGGAGAAG
ACCAAATTACCGTTTGGGGGTTCCACTCTGATAACGAAACCCAAATGGCAAAGCTCTATGGGGACTCAAA

GCCCCAGAAGTTCACCTCATCTGCCAACGGAGTGACCACACATTACGTTTCACAGATTGGTGGCTTCCCA
AATCAAACAGAAGACGGAGGACTACCACAAAGCGGTAGAATTGTTGTTGATTACATGGTGCAAAAATCT
GGGAAAACAGGAACAATTACCTATCAAAGAGGTATTTTATTGCCTCAAAAAGTGTGGTGCGCAAGTGGC
AGGAGCAAGGTAATAAAAGGATCGTTGCCTTTAATTGGAGAAGCAGATTGCCTCCACGAAAAATACGGT
GGATTAAACAAAAGCAAGCCTTACTACACAGGGGAACATGCAAAGGCCATAGGAAATTGCCCAATATGG
GTGAAAACACCCTTGAAGCTGGCCAATGGAACCAAATATAGACCTCCTGCAAAACTATTAAAGGAAAGG
GGTTTCTTCGGAGCTATTGCTGGTTTCTTAGAAGGAGGATGGGAAGGAATGATTGCAGGTTGGCACGGAT
ACACATCCCATGGGGCACATGGAGTAGCGGTGGCAGCAGACCTTAAGAGCACTCAAGAGGCCATAAACA
AGATAACAAAAAATCTCAACTCTTTGAGTGAGCTGGAAGTAAAGAATCTTCAAAGACTAAGCGGTGCCA
TGGATGAACTCCACAACGAAATACTAGAACTAGACGAGAAAGTGGATGATCTCAGAGCTGATACAATAA
GCTCACAAATAGAACTCGCAGTCCTGCTTTCCAATGAAGGAATAATAAACAGTGAAGATGAGCATCTCTT
GGCGCTTGAAAGAAAGCTGAAGAAAATGCTGGGCCCCTCTGCTGTAGAGATAGGGAATGGATGCTTTGA
AACCAAACACAAGTGCAACCAGACCTGTCTCGACAGAATAGCTGCTGGTACCTTTGATGCAGGAGAATTT
TCTCTCCCCACTTTTGATTCACTGAATATTACTGCTGCATCTTTAAATGACGATGGATTGGATAATCATAC
TATACTGCTTTACTACTCAACTGCTGCCTCCAGTTTGGCTGTAACATTGATGATAGCTATCTTTGTTGTTTA
TATGGTCTCCAGAGACAATGTTTCTTGCTCCATCTGTCTATAAAGGCCTATTTTCTTTAGTTTGAATTTACT
GTTATTCGGTGTGCATTTCTATGTTTGGTGAGCGGTTTTCTGTGCTCAGAGTGTGTTTATTTTATGTAATTT
AATTTCTTTGTGAGCTCCTGTTTAGCAGGTCGTCCCTTCAGCAAGGACACAAAAAGATTTTAATTTTATTA
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GCAATAAAGTTTCTTAAGATTGAATCCTGTTGCCGGTCTTGCGATGATTATCATATAATTTCTGTTGAATT
ACGTTAAGCATGTAATAATTAACATGTAATGCATGACGTTATTTATGAGATGGGTTTTTATGATTAGAGTC
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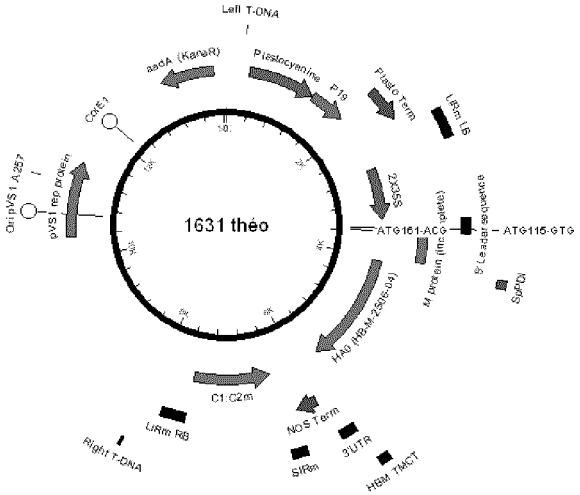
Figure 28G, SEQ ID NO: 64

Amino acid sequence of PDISP-HA from influenza B/Malaysia/2506/2004

MAKNVAIFGLLFSLLVLVPSQIFADRICTGITSSNSPHVVKTATQGEVNVTGVIPLTTTPTKSHFANLKGTETRG
KLCPKCLNCTDLDVALGRPKCTGNIPSARVSILHEVRPVTSGCFPIMHDRTKIRQLPKLLRGYEHIRLSTHNVIN
AENAPGGPYKIGTSGSCPNVTNGNGFFATMAWAVPKNDNNKTATNSLTIEVPYICTEGEDQITVWGFHSDNET
QMAKLYGDSKPQKFTSSANGVTTHYVSQIGGFPNQTEDGGLPQSGRIVVDYMVQKSGKTGTITYQRGILLPQ
KVWCASGRSKVIKGSLPLIGEADCLHEKYGGLNKSKPYYTGEHAKAIGNCPIWVKTPLKLANGTKYRPPAKL
LKERGFFGAIAGFLEGGWEGMIAGWHGYTSHGAHGVAVAADLKSTQEAINKITKNLNSLSELEVKNLQRLSG
AMDELHNEILELDEKVDDLRADTISSQIELAVLLSNEGIINSEDEHLLALERKLKKMLGPSAVEIGNGCFETKH
KCNQTCLDRIAAGTFDAGEFSLPTFDSLNITAASLNDDGLDNHTILLYYSTAASSLAVTLMIAIFVVYMVSRDN
VSCSICL*

Figure 28H

Schematic representation of construct number 1631


LeftT-DNA
aadA (KanaR)
Prestocyanine P19
Prestoi Term
LIRm LB
CoiE1
1631 théo
SSCK22
ATG161-ACG
5' Leader sequence
ATG115-GTG
M protein (incomplete)
SpPDI
HA0 (HBM-2SIE-DA)
C1:C2m
NOS Term
LIRm RB
Right T-DNA
SIRm
3'UTR
HBM TMCT

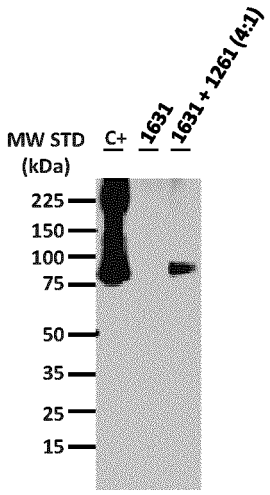


Figure 29.

Figure 30A.

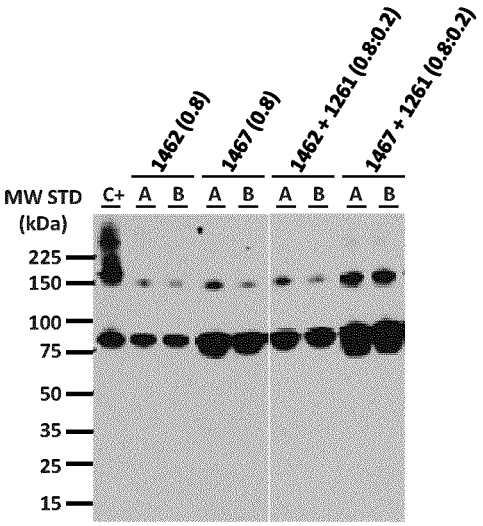


Figure 30B.

Construct number	Hemagglutination capacity (HA titer)[a]
1462 (0.8)	136 ± 48
1467 (0.8)	2660 ± 384
1462 + 1261 (0.8:0.2)	941 ± 192
1467 + 1261 (0.8:0.2)	4344 ± 1536

[a] Inverse of the highest dilution capable of agglutinating red blood cells.

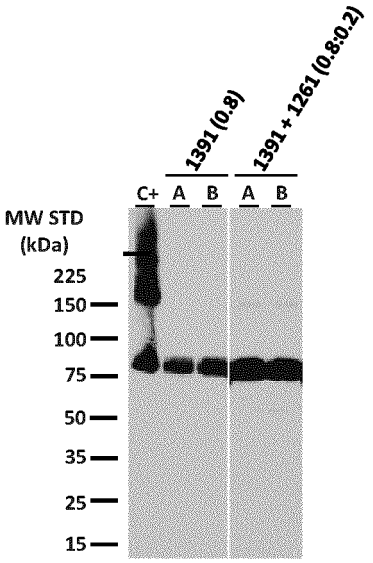

1391 (0.8)
1391 + 1261 (0.8:0.2)
C+
A
B
A
B
MW STD
(kDa)
225
150
100
75
50
35
25
15

Figure 31.