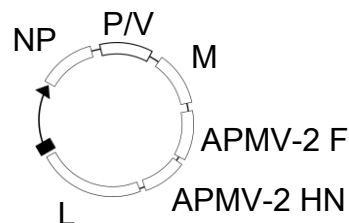
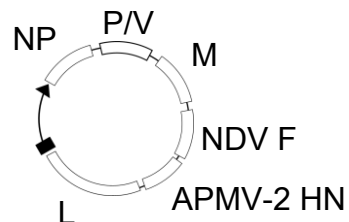


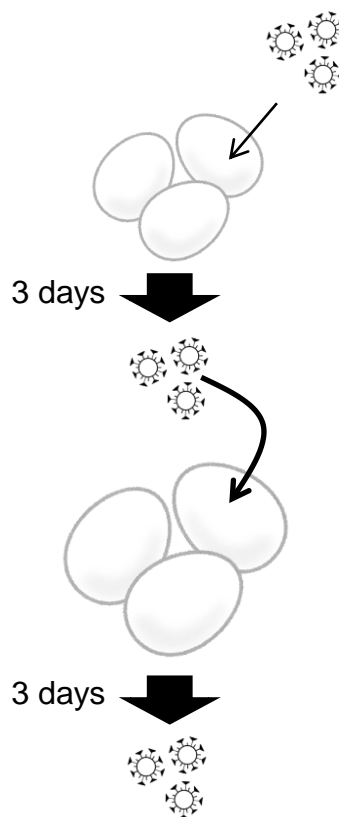
**Figure S1. Electrophoresis indicated higher intensity specific band and lower intensity non-specific bands using plasmids.**

Electrophoresis of PCR which amplified plasmid inserted in each viral genome using each primer set. Arrows indicate expected size.

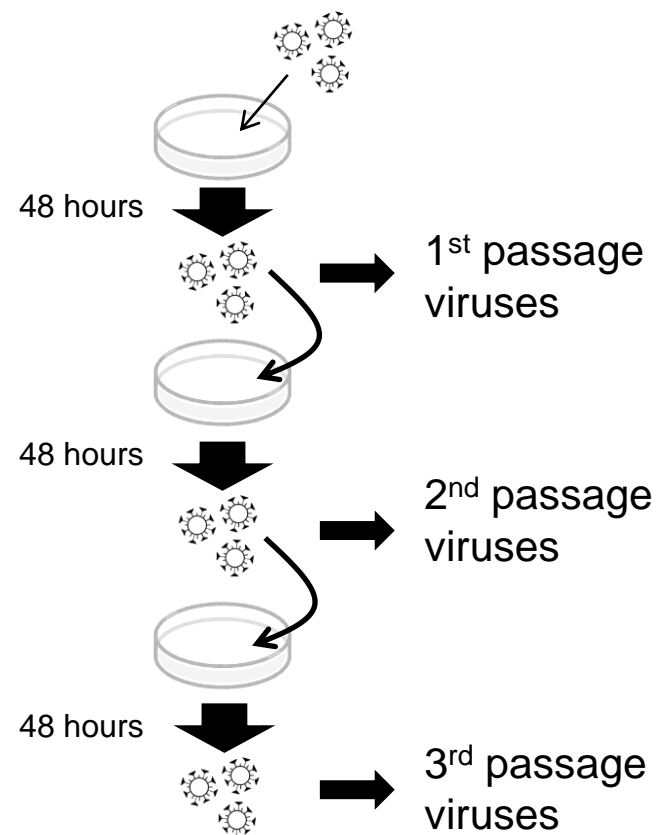
A



Plasmids  
for rescue experiments



Viruses were passaged in  
embryonated eggs  
more than twice



Viruses were passaged in  
HEp-2 cells  
(1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> passage  
viruses were sequenced)

B

## rNDV-2HN (NDV F gene)

Plasmid : Plasmids for rescue experiments  
 Egg : Viruses were propagated in embryonated eggs  
 1st Cell :  
 2nd Cell :  
 3rd Cell : Each passage viruses in HEp-2 cells

Plasmid	1	ATGGGCTCCAGACCTTCTACCAAGAACCAGCACCTATGATGCTGACTATCCGGGTCGGCTGGTACTGAGTTGCATCTG	120
Egg	1	ATGGGCTCCAGACCTTCTACCAAGAACCAGCACCTATGATGCTGACTATCCGGGTCGGCTGGTACTGAGTTGCATCTGTCGGGCAAACCTCCATTGATGGCAGGCGCTTTCGACGTGCA	120
1st Cell	1	ATGGGCTCCAGACCTTCTACCAAGAACCAGCACCTATGATGCTGACTATCCGGGTCGGCTGGTACTGAGTTGCATCTGTCGGGCAAACCTCCATTGATGGCAGGCGCTTTCGACGTGCA	120
2nd Cell	1	ATGGGCTCCAGACCTTCTACCAAGAACCAGCACCTATGATGCTGACTATCCGGGTCGGCTGGTACTGAGTTGCATCTGTCGGGCAAACCTCCATTGATGGCAGGCGCTTTCGACGTGCA	120
3rd Cell	1	ATGGGCTCCAGACCTTCTACCAAGAACCAGCACCTATGATGCTGACTATCCGGGTCGGCTGGTACTGAGTTGCATCTGTCGGGCAAACCTCCATTGATGGCAGGCGCTTTCGACGTGCA	120
Plasmid	121	GGAATTGTGGTTACAGGAGACAAAGCAGTCAACATATACACCTCATCCCAGACAGGATCAATCATAGTTAAGCTCCTCCCGAATCTGCCAAGGATAAGGAGGCATGTGCGAAAGCCCC	240
Egg	121	GGAATTGTGGTTACAGGAGACAAAGCAGTCAACATATACACCTCATCCCAGACAGGATCAATCATAGTTAAGCTCCTCCCGAATCTGCCAAGGATAAGGAGGCATGTGCGAAAGCCCC	240
1st Cell	121	GGAATTGTGGTTACAGGAGACAAAGCAGTCAACATATACACCTCATCCCAGACAGGATCAATCATAGTTAAGCTCCTCCCGAATCTGCCAAGGATAAGGAGGCATGTGCGAAAGCCCC	240
2nd Cell	121	GGAATTGTGGTTACAGGAGACAAAGCAGTCAACATATACACCTCATCCCAGACAGGATCAATCATAGTTAAGCTCCTCCCGAATCTGCCAAGGATAAGGAGGCATGTGCGAAAGCCCC	240
3rd Cell	121	GGAATTGTGGTTACAGGAGACAAAGCAGTCAACATATACACCTCATCCCAGACAGGATCAATCATAGTTAAGCTCCTCCCGAATCTGCCAAGGATAAGGAGGCATGTGCGAAAGCCCC	240
Plasmid	241	TTGGATGCATACAAACAGGACATTGACCACCTTGTCTACCCCCCTTGGTGACTCTATCCGTAGGATACAAGAGCTGTGACTACATCTGGAGGGGGGAGACAGGGGCGCCTTATAGGCGCC	360
Egg	241	TTGGATGCATACAAACAGGACATTGACCACCTTGTCTACCCCCCTTGGTGACTCTATCCGTAGGATACAAGAGCTGTGACTACATCTGGAGGGGGGAGACAGGGGCGCCTTATAGGCGCC	360
1st Cell	241	TTGGATGCATACAAACAGGACATTGACCACCTTGTCTACCCCCCTTGGTGACTCTATCCGTAGGATACAAGAGCTGTGACTACATCTGGAGGGGGGAGACAGGGGCGCCTTATAGGCGCC	360
2nd Cell	241	TTGGATGCATACAAACAGGACATTGACCACCTTGTCTACCCCCCTTGGTGACTCTATCCGTAGGATACAAGAGCTGTGACTACATCTGGAGGGGGGAGACAGGGGCGCCTTATAGGCGCC	360
3rd Cell	241	TTGGATGCATACAAACAGGACATTGACCACCTTGTCTACCCCCCTTGGTGACTCTATCCGTAGGATACAAGAGCTGTGACTACATCTGGAGGGGGGAGACAGGGGCGCCTTATAGGCGCC	360
Plasmid	361	ATTATTGGCGGTGTGGCTCTTGGGGTTGCAACTGCCGCACAAATAACAGCGGGCGCAGCTGTGATACAAGCGAAACAAATGCTGCCAACATCTCCGACTTAAAGAGAGCATTGCGCGA	480
Egg	361	ATTATTGGCGGTGTGGCTCTTGGGGTTGCAACTGCCGCACAAATAACAGCGGGCGCAGCTGTGATACAAGCGAAACAAATGCTGCCAACATCTCCGACTTAAAGAGAGCATTGCGCGA	480
1st Cell	361	ATTATTGGCGGTGTGGCTCTTGGGGTTGCAACTGCCGCACAAATAACAGCGGGCGCAGCTGTGATACAAGCGAAACAAATGCTGCCAACATCTCCGACTTAAAGAGAGCATTGCGCGA	480
2nd Cell	361	ATTATTGGCGGTGTGGCTCTTGGGGTTGCAACTGCCGCACAAATAACAGCGGGCGCAGCTGTGATACAAGCGAAACAAATGCTGCCAACATCTCCGACTTAAAGAGAGCATTGCGCGA	480
3rd Cell	361	ATTATTGGCGGTGTGGCTCTTGGGGTTGCAACTGCCGCACAAATAACAGCGGGCGCAGCTGTGATACAAGCGAAACAAATGCTGCCAACATCTCCGACTTAAAGAGAGCATTGCGCGA	480
Plasmid	481	ACCAATGAGGCTGTGCATGAGGTCACTGACGGATTATCGCAACTAGCAGTGGCAGTTGGGAAGATGCAGCAGTTTGTTAATGACCAATTTAATAAAACAGCTCAGGAATTAGACTGCATC	600
Egg	481	ACCAATGAGGCTGTGCATGAGGTCACTGACGGATTATCGCAACTAGCAGTGGCAGTTGGGAAGATGCAGCAGTTTGTTAATGACCAATTTAATAAAACAGCTCAGGAATTAGACTGCATC	600
1st Cell	481	ACCAATGAGGCTGTGCATGAGGTCACTGACGGATTATCGCAACTAGCAGTGGCAGTTGGGAAGATGCAGCAGTTTGTTAATGACCAATTTAATAAAACAGCTCAGGAATTAGACTGCATC	600
2nd Cell	481	ACCAATGAGGCTGTGCATGAGGTCACTGACGGATTATCGCAACTAGCAGTGGCAGTTGGGAAGATGCAGCAGTTTGTTAATGACCAATTTAATAAAACAGCTCAGGAATTAGACTGCATC	600
3rd Cell	481	ACCAATGAGGCTGTGCATGAGGTCACTGACGGATTATCGCAACTAGCAGTGGCAGTTGGGAAGATGCAGCAGTTTGTTAATGACCAATTTAATAAAACAGCTCAGGAATTAGACTGCATC	600
Plasmid	601	AAAATTGCACAGCAAGTTGGTGATAGAGCTCAACCTGTACCTTAACCGAATTGACTACAGATTTCGGACCACAAATCACTTCACCTGCCTTAAACAGCTGACTATTAGCAGCACTTTACAAT	720
Egg	601	AAAATTGCACAGCAAGTTGGTGATAGAGCTCAACCTGTACCTTAACCGAATTGACTACAGATTTCGGACCACAAATCACTTCACCTGCCTTAAACAGCTGACTATTAGCAGCACTTTACAAT	720
1st Cell	601	AAAATTGCACAGCAAGTTGGTGATAGAGCTCAACCTGTACCTTAACCGAATTGACTACAGATTTCGGACCACAAATCACTTCACCTGCCTTAAACAGCTGACTATTAGCAGCACTTTACAAT	720
2nd Cell	601	AAAATTGCACAGCAAGTTGGTGATAGAGCTCAACCTGTACCTTAACCGAATTGACTACAGATTTCGGACCACAAATCACTTCACCTGCCTTAAACAGCTGACTATTAGCAGCACTTTACAAT	720
3rd Cell	601	AAAATTGCACAGCAAGTTGGTGATAGAGCTCAACCTGTACCTTAACCGAATTGACTACAGATTTCGGACCACAAATCACTTCACCTGCCTTAAACAGCTGACTATTAGCAGCACTTTACAAT	720
Plasmid	721	CTAGCTGGTGGGAATATGGATTACTTATTGACTAAGTTAGGTATAGGGAACAATCAACTCAGCTCATTAAATCGGTAGCGGCTTAATCACCGGTAACCTATTCTATACGACTCACAGACT	840
Egg	721	CTAGCTGGTGGGAATATGGATTACTTATTGACTAAGTTAGGTATAGGGAACAATCAACTCAGCTCATTAAATCGGTAGCGGCTTAATCACCGGTAACCTATTCTATACGACTCACAGACT	840
1st Cell	721	CTAGCTGGTGGGAATATGGATTACTTATTGACTAAGTTAGGTATAGGGAACAATCAACTCAGCTCATTAAATCGGTAGCGGCTTAATCACCGGTAACCTATTCTATACGACTCACAGACT	840
2nd Cell	721	CTAGCTGGTGGGAATATGGATTACTTATTGACTAAGTTAGGTATAGGGAACAATCAACTCAGCTCATTAAATCGGTAGCGGCTTAATCACCGGTAACCTATTCTATACGACTCACAGACT	840
3rd Cell	721	CTAGCTGGTGGGAATATGGATTACTTATTGACTAAGTTAGGTATAGGGAACAATCAACTCAGCTCATTAAATCGGTAGCGGCTTAATCACCGGTAACCTATTCTATACGACTCACAGACT	840
Plasmid	841	CAACTCTTGGGTATACAGTAACCTTCACTTCAGTCGGGAACCTAAATAATATGCGTGCCACCTACTTGGAAACCTTATCCGTAAGCACAACACAGGGGATTTCGCTCGGCACCTTGTCCCA	960
Egg	841	CAACTCTTGGGTATACAGTAACCTTCACTTCAGTCGGGAACCTAAATAATATGCGTGCCACCTACTTGGAAACCTTATCCGTAAGCACAACACAGGGGATTTCGCTCGGCACCTTGTCCCA	960
1st Cell	841	CAACTCTTGGGTATACAGTAACCTTCACTTCAGTCGGGAACCTAAATAATATGCGTGCCACCTACTTGGAAACCTTATCCGTAAGCACAACACAGGGGATTTCGCTCGGCACCTTGTCCCA	960
2nd Cell	841	CAACTCTTGGGTATACAGTAACCTTCACTTCAGTCGGGAACCTAAATAATATGCGTGCCACCTACTTGGAAACCTTATCCGTAAGCACAACACAGGGGATTTCGCTCGGCACCTTGTCCCA	960
3rd Cell	841	CAACTCTTGGGTATACAGTAACCTTCACTTCAGTCGGGAACCTAAATAATATGCGTGCCACCTACTTGGAAACCTTATCCGTAAGCACAACACAGGGGATTTCGCTCGGCACCTTGTCCCA	960
Plasmid	961	AAAGTGGTGACACAGGTGCGTTCTGTGATAGAAGAACTTGACACCTCATACTGTATAGAACTGACTTAGATTTATATTGTACAGAAGATAGTAACGTTCCCTATGTCCTCGTGGTATTAT	1080
Egg	961	AAAGTGGTGACACAGGTGCGTTCTGTGATAGAAGAACTTGACACCTCATACTGTATAGAACTGACTTAGATTTATATTGTACAGAAGATAGTAACGTTCCCTATGTCCTCGTGGTATTAT	1080
1st Cell	961	AAAGTGGTGACACAGGTGCGTTCTGTGATAGAAGAACTTGACACCTCATACTGTATAGAACTGACTTAGATTTATATTGTACAGAAGATAGTAACGTTCCCTATGTCCTCGTGGTATTAT	1080
2nd Cell	961	AAAGTGGTGACACAGGTGCGTTCTGTGATAGAAGAACTTGACACCTCATACTGTATAGAACTGACTTAGATTTATATTGTACAGAAGATAGTAACGTTCCCTATGTCCTCGTGGTATTAT	1080
3rd Cell	961	AAAGTGGTGACACAGGTGCGTTCTGTGATAGAAGAACTTGACACCTCATACTGTATAGAACTGACTTAGATTTATATTGTACAGAAGATAGTAACGTTCCCTATGTCCTCGTGGTATTAT	1080
Plasmid	1081	TCTCGTTTGAGCGGCAATACATCGGCCTGTATGTACTCAAAGACCGAAGGCGCACTTACTACACCATATATGACTATCAAAGGCTCAGTCATCGCTAAGTCAAGATGACAAACATGTAGA	1200
Egg	1081	TCTCGTTTGAGCGGCAATACATCGGCCTGTATGTACTCAAAGACCGAAGGCGCACTTACTACACCATATATGACTATCAAAGGCTCAGTCATCGCTAAGTCAAGATGACAAACATGTAGA	1200
1st Cell	1081	TCTCGTTTGAGCGGCAATACATCGGCCTGTATGTACTCAAAGACCGAAGGCGCACTTACTACACCATATATGACTATCAAAGGCTCAGTCATCGCTAAGTCAAGATGACAAACATGTAGA	1200
2nd Cell	1081	TCTCGTTTGAGCGGCAATACATCGGCCTGTATGTACTCAAAGACCGAAGGCGCACTTACTACACCATATATGACTATCAAAGGCTCAGTCATCGCTAAGTCAAGATGACAAACATGTAGA	1200
3rd Cell	1081	TCTCGTTTGAGCGGCAATACATCGGCCTGTATGTACTCAAAGACCGAAGGCGCACTTACTACACCATATATGACTATCAAAGGCTCAGTCATCGCTAAGTCAAGATGACAAACATGTAGA	1200
Plasmid	1201	TGTGTAAACCCCCCGGTATCATATCGCAAAACTATGGAGAAGCCGTGTCTCTAATAGATAAAACATCATGCAATGTTTTATCCTTAGCGGGGATAACTTTAAGGCTCAGTGGGGAATTC	1320
Egg	1201	TGTGTAAACCCCCCGGTATCATATCGCAAAACTATGGAGAAGCCGTGTCTCTAATAGATAAAACATCATGCAATGTTTTATCCTTAGCGGGGATAACTTTAAGGCTCAGTGGGGAATTC	1320
1st Cell	1201	TGTGTAAACCCCCCGGTATCATATCGCAAAACTATGGAGAAGCCGTGTCTCTAATAGATAAAACATCATGCAATGTTTTATCCTTAGCGGGGATAACTTTAAGGCTCAGTGGGGAATTC	1320
2nd Cell	1201	TGTGTAAACCCCCCGGTATCATATCGCAAAACTATGGAGAAGCCGTGTCTCTAATAGATAAAACATCATGCAATGTTTTATCCTTAGCGGGGATAACTTTAAGGCTCAGTGGGGAATTC	1320
3rd Cell	1201	TGTGTAAACCCCCCGGTATCATATCGCAAAACTATGGAGAAGCCGTGTCTCTAATAGATAAAACATCATGCAATGTTTTATCCTTAGCGGGGATAACTTTAAGGCTCAGTGGGGAATTC	1320
Plasmid	1321	GATGTAACCTTATCAGAAGAAATATCTCAATACAAGATTCTCAAGTAATAATAACAGGCAATCTTGATATCTCAACTGAGCTTGGGAATGTCAACAACCTCGATCAGTAATGCTTTGAATAAG	1440
Egg	1321	GATGTAACCTTATCAGAAGAAATATCTCAATACAAGATTCTCAAGTAATAATAACAGGCAATCTTGATATCTCAACTGAGCTTGGGAATGTCAACAACCTCGATCAGTAATGCTTTGAATAAG	1440
1st Cell	1321	GATGTAACCTTATCAGAAGAAATATCTCAATACAAGATTCTCAAGTAATAATAACAGGCAATCTTGATATCTCAACTGAGCTTGGGAATGTCAACAACCTCGATCAGTAATGCTTTGAATAAG	1440
2nd Cell	1321	GATGTAACCTTATCAGAAGAAATATCTCAATACAAGATTCTCAAGTAATAATAACAGGCAATCTTGATATCTCAACTGAGCTTGGGAATGTCAACAACCTCGATCAGTAATGCTTTGAATAAG	1440
3rd Cell	1321	GATGTAACCTTATCAGAAGAAATATCTCAATACAAGATTCTCAAGTAATAATAACAGGCAATCTTGATATCTCAACTGAGCTTGGGAATGTCAACAACCTCGATCAGTAATGCTTTGAATAAG	1440
Plasmid	1441	TTAGAGGAAAGCAACAGAAAACTAGACAAAGTCAATGTCAAACCTGACGACACATCTGCTCTCATACCTATATCGTTTTGACTATCATATCTTGTTTTTGGTGATACTTAGCCTGATT	1560
Egg	1441	TTAGAGGAAAGCAACAGAAAACTAGACAAAGTCAATGTCAAACCTGACGACACATCTGCTCTCATACCTATATCGTTTTGACTATCATATCTCTTGTTTTTGGTGATACTTAGCCTGATT	1560
1st Cell	1441	TTAGAGGAAAGCAACAGAAAACTAGACAAAGTCAATGTCAAACCTGACGACACATCTGCTCTCATACCTATATCGTTTTGACTATCATATCTCTTGTTTTTGGTGATACTTAGCCTGATT	1560
2nd Cell	1441	TTAGAGGAAAGCAACAGAAAACTAGACAAAGTCAATGTCAAACCTGACGACACATCTGCTCTCATACCTATATCGTTTTGACTATCATATCTCTTGTTTTTGGTGATACTTAGCCTGATT	1560
3rd Cell	1441	TTAGAGGAAAGCAACAGAAAACTAGACAAAGTCAATGTCAAACCTGACGACACATCTGCTCTCATACCTATATCGTTTTGACTATCATATCTCTTGTTTTTGGTGATACTTAGCCTGATT	1560
Plasmid	1561	CTAGCATGCTACCTAATGTACAAGCAAAAGGCGCAACAAAAGACCTTATTATGGCTTGGGAATAATACCTAGATCAGATGAGAGGCCACTACAAAATGTGA	1662
Egg	1561	CTAGCATGCTACCTAATGTACAAGCAAAAGGCGCAACAAAAGACCTTATTATGGCTTGGGAATAATACCTAGATCAGATGAGAGGCCACTACAAAATGTGA	1662
1st Cell	1561	CTAGCATGCTACCTAATGTACAAGCAAAAGGCGCAACAAAAGACCTTATTATGGCTTGGGAATAATACCTAGATCAGATGAGAGGCCACTACAAAATGTGA	1662
2nd Cell	1561	CTAGCATGCTACCTAATGTACAAGCAAAAGGCGCAACAAAAGACCTTATTATGGCTTGGGAATAATACCTAGATCAGATGAGAGGCCACTACAAAATGTGA	1662
3rd Cell	1561	CTAGCATGCTACCTAATGTACAAGCAAAAGGCGCAACAAAAGACCTTATTATGGCTTGGGAATAATACCTAGATCAGATGAGAGGCCACTACAAAATGTGA	1662

Plasmid : Plasmids for rescue experiments  
 Egg : Viruses were propagated in embryonated eggs  
 1st Cell :  
 2nd Cell :  
 3rd Cell :  
 Each passage viruses in HEp-2 cells

## rNDV-2HN (APMV-2 HN gene)

Plasmid	1	ATGGATTTCCCATCTAGGGAGAACCTGGCAGCAGGTGACATATCGGGGCGGAAGACTTGGAGATTACTGTTCGGGATCTCCACATTGAGCATAGGTGTGGTCTGTCTTGCCATCAATATT	120
Egg	1	ATGGATTTCCCATCTAGGGAGAACCTGGCAGCAGGTGACATATCGGGGCGGAAGACTTGGAGATTACTGTTCGGGATCTCCACATTGAGCATAGGTGTGGTCTGTCTTGCCATCAATATT	120
1st Cell	1	ATGGATTTCCCATCTAGGGAGAACCTGGCAGCAGGTGACATATCGGGGCGGAAGACTTGGAGATTACTGTTCGGGATCTCCACATTGAGCATAGGTGTGGTCTGTCTTGCCATCAATATT	120
2nd Cell	1	ATGGATTTCCCATCTAGGGAGAACCTGGCAGCAGGTGACATATCGGGGCGGAAGACTTGGAGATTACTGTTCGGGATCTCCACATTGAGCATAGGTGTGGTCTGTCTTGCCATCAATATT	120
3rd Cell	1	ATGGATTTCCCATCTAGGGAGAACCTGGCAGCAGGTGACATATCGGGGCGGAAGACTTGGAGATTACTGTTCGGGATCTCCACATTGAGCATAGGTGTGGTCTGTCTTGCCATCAATATT	120
Plasmid	121	GCCACAATTGCAAAATTTGGATCACCTGGATAACATGGCTTCGAACACATGGACAACAACCTGAGGCTGACCGTGTGATATCAGCATCAGCACTCGCTCAAAGTCCCTGTCAACCAGATT	240
Egg	121	GCCACAATTGCAAAATTTGGATCACCTGGATAACATGGCTTCGAACACATGGACAACAACCTGAGGCTGACCGTGTGATATCAGCATCAGCACTCGCTCAAAGTCCCTGTCAACCAGATT	240
1st Cell	121	GCCACAATTGCAAAATTTGGATCACCTGGATAACATGGCTTCGAACACATGGACAACAACCTGAGGCTGACCGTGTGATATCAGCATCAGCACTCGCTCAAAGTCCCTGTCAACCAGATT	240
2nd Cell	121	GCCACAATTGCAAAATTTGGATCACCTGGATAACATGGCTTCGAACACATGGACAACAACCTGAGGCTGACCGTGTGATATCAGCATCAGCACTCGCTCAAAGTCCCTGTCAACCAGATT	240
3rd Cell	121	GCCACAATTGCAAAATTTGGATCACCTGGATAACATGGCTTCGAACACATGGACAACAACCTGAGGCTGACCGTGTGATATCAGCATCAGCACTCGCTCAAAGTCCCTGTCAACCAGATT	240
Plasmid	241	AATGACATGTTTCGGATTGTAGCGCTTGACCTACCTCTGCAGATGACATCATTACAGAAAGAACAGCATCCCAAGTCGGGTCTTGCGTGAAAGTATCAACAATGTTTTATCCAAGAA	360
Egg	241	AATGACATGTTTCGGATTGTAGCGCTTGACCTACCTCTGCAGATGACATCATTACAGAAAGAACAGCATCCCAAGTCGGGTCTTGCGTGAAAGTATCAACAATGTTTTATCCAAGAA	360
1st Cell	241	AATGACATGTTTCGGATTGTAGCGCTTGACCTACCTCTGCAGATGACATCATTACAGAAAGAACAGCATCCCAAGTCGGGTCTTGCGTGAAAGTATCAACAATGTTTTATCCAAGAA	360
2nd Cell	241	AATGACATGTTTCGGATTGTAGCGCTTGACCTACCTCTGCAGATGACATCATTACAGAAAGAACAGCATCCCAAGTCGGGTCTTGCGTGAAAGTATCAACAATGTTTTATCCAAGAA	360
3rd Cell	241	AATGACATGTTTCGGATTGTAGCGCTTGACCTACCTCTGCAGATGACATCATTACAGAAAGAACAGCATCCCAAGTCGGGTCTTGCGTGAAAGTATCAACAATGTTTTATCCAAGAA	360
Plasmid	361	GGATCTGCAGGCTGGTCTTGTGAATGACCTGAATATCGAGGGGGATCGCTGTACGTTGTACCAAGGAGATGCATTCGAGGCCATAATTTCCAGGCCATTTCTTAATAGAACAT	480
Egg	361	GGATCTGCAGGCTGGTCTTGTGAATGACCTGAATATCGAGGGGGATCGCTGTACGTTGTACCAAGGAGATGCATTCGAGGCCATAATTTCCAGGCCATTTCTTAATAGAACAT	480
1st Cell	361	GGATCTGCAGGCTGGTCTTGTGAATGACCTGAATATCGAGGGGGATCGCTGTACGTTGTACCAAGGAGATGCATTCGAGGCCATAATTTCCAGGCCATTTCTTAATAGAACAT	480
2nd Cell	361	GGATCTGCAGGCTGGTCTTGTGAATGACCTGAATATCGAGGGGGATCGCTGTACGTTGTACCAAGGAGATGCATTCGAGGCCATAATTTCCAGGCCATTTCTTAATAGAACAT	480
3rd Cell	361	GGATCTGCAGGCTGGTCTTGTGAATGACCTGAATATCGAGGGGGATCGCTGTACGTTGTACCAAGGAGATGCATTCGAGGCCATAATTTCCAGGCCATTTCTTAATAGAACAT	480
Plasmid	481	CCAAGTTTTGTCCTGGTCTACTACTGCTAAGGGCTGTATAAGGATCCCGACCTTCCATATGGGCCCTTCACATTGGTGTACTACATACATCATTGCATCAGGTTGCCAGGATGCG	600
Egg	481	CCAAGTTTTGTCCTGGTCTACTACTGCTAAGGGCTGTATAAGGATCCCGACCTTCCATATGGGCCCTTCACATTGGTGTACTACATACATCATTGCATCAGGTTGCCAGGATGCG	600
1st Cell	481	CCAAGTTTTGTCCTGGTCTACTACTGCTAAGGGCTGTATAAGGATCCCGACCTTCCATATGGGCCCTTCACATTGGTGTACTACATACATCATTGCATCAGGTTGCCAGGATGCG	600
2nd Cell	481	CCAAGTTTTGTCCTGGTCTACTACTGCTAAGGGCTGTATAAGGATCCCGACCTTCCATATGGGCCCTTCACATTGGTGTACTACATACATCATTGCATCAGGTTGCCAGGATGCG	600
3rd Cell	481	CCAAGTTTTGTCCTGGTCTACTACTGCTAAGGGCTGTATAAGGATCCCGACCTTCCATATGGGCCCTTCACATTGGTGTACTACATACATCATTGCATCAGGTTGCCAGGATGCG	600
Plasmid	601	AGCCATCCAGTATGTATATCTCTCTGGGGTGTCTGAAAGCATCGCAGCCGGGTGCGCTATCTTCTTGACAACGGCCAGCCAGCTCGTGGATGACAACATCAACCGGAAGTCATGCAGC	720
Egg	601	AGCCATCCAGTATGTATATCTCTCTGGGGTGTCTGAAAGCATCGCAGCCGGGTGCGCTATCTTCTTGACAACGGCCAGCCAGCTCGTGGATGACAACATCAACCGGAAGTCATGCAGC	720
1st Cell	601	AGCCATCCAGTATGTATATCTCTCTGGGGTGTCTGAAAGCATCGCAGCCGGGTGCGCTATCTTCTTGACAACGGCCAGCCAGCTCGTGGATGACAACATCAACCGGAAGTCATGCAGC	720
2nd Cell	601	AGCCATCCAGTATGTATATCTCTCTGGGGTGTCTGAAAGCATCGCAGCCGGGTGCGCTATCTTCTTGACAACGGCCAGCCAGCTCGTGGATGACAACATCAACCGGAAGTCATGCAGC	720
3rd Cell	601	AGCCATCCAGTATGTATATCTCTCTGGGGTGTCTGAAAGCATCGCAGCCGGGTGCGCTATCTTCTTGACAACGGCCAGCCAGCTCGTGGATGACAACATCAACCGGAAGTCATGCAGC	720
Plasmid	721	ATCGTAGCCTCAAAATACGTTGTGATATCCTATGCAGTATTGTGATTGAAACAGAGGATGAGGATTATAGGTTGATCCGGCTACTAGCATGATTATAGGTAGGCTGTTCTTCAACGGG	840
Egg	721	ATCGTAGCCTCAAAATACGTTGTGATATCCTATGCAGTATTGTGATTGAAACAGAGGATGAGGATTATAGGTTGATCCGGCTACTAGCATGATTATAGGTAGGCTGTTCTTCAACGGG	840
1st Cell	721	ATCGTAGCCTCAAAATACGTTGTGATATCCTATGCAGTATTGTGATTGAAACAGAGGATGAGGATTATAGGTTGATCCGGCTACTAGCATGATTATAGGTAGGCTGTTCTTCAACGGG	840
2nd Cell	721	ATCGTAGCCTCAAAATACGTTGTGATATCCTATGCAGTATTGTGATTGAAACAGAGGATGAGGATTATAGGTTGATCCGGCTACTAGCATGATTATAGGTAGGCTGTTCTTCAACGGG	840
3rd Cell	721	ATCGTAGCCTCAAAATACGTTGTGATATCCTATGCAGTATTGTGATTGAAACAGAGGATGAGGATTATAGGTTGATCCGGCTACTAGCATGATTATAGGTAGGCTGTTCTTCAACGGG	840
Plasmid	841	TCATACACAGAGAGCAAGATTAAACACAGGGTCCATCTTCAGTCTATTCTCTGCTAATACCTCGCGTGGGTGCGGTATTGTAGTCGGGGATGAAGCCGCATTCCCAATATATGGTGGG	960
Egg	841	TCATACACAGAGAGCAAGATTAAACACAGGGTCCATCTTCAGTCTATTCTCTGCTAATACCTCGCGTGGGTGCGGTATTGTAGTCGGGGATGAAGCCGCATTCCCAATATATGGTGGG	960
1st Cell	841	TCATACACAGAGAGCAAGATTAAACACAGGGTCCATCTTCAGTCTATTCTCTGCTAATACCTCGCGTGGGTGCGGTATTGTAGTCGGGGATGAAGCCGCATTCCCAATATATGGTGGG	960
2nd Cell	841	TCATACACAGAGAGCAAGATTAAACACAGGGTCCATCTTCAGTCTATTCTCTGCTAATACCTCGCGTGGGTGCGGTATTGTAGTCGGGGATGAAGCCGCATTCCCAATATATGGTGGG	960
3rd Cell	841	TCATACACAGAGAGCAAGATTAAACACAGGGTCCATCTTCAGTCTATTCTCTGCTAATACCTCGCGTGGGTGCGGTATTGTAGTCGGGGATGAAGCCGCATTCCCAATATATGGTGGG	960
Plasmid	961	GTCACGAGCAACACATGGTTGTTTCAACAGCTCAAGGATTTTGGTTACTTCAACCATAATGATGTGTACAAGTGAATCGCAATCGGATGATATACAGCAAACTCTCGGATGCATACAGGCCA	1080
Egg	961	GTCACGAGCAACACATGGTTGTTTCAACAGCTCAAGGATTTTGGTTACTTCAACCATAATGATGTGTACAAGTGAATCGCAATCGGATGATATACAGCAAACTCTCGGATGCATACAGGCCA	1080
1st Cell	961	GTCACGAGCAACACATGGTTGTTTCAACAGCTCAAGGATTTTGGTTACTTCAACCATAATGATGTGTACAAGTGAATCGCAATCGGATGATATACAGCAAACTCTCGGATGCATACAGGCCA	1080
2nd Cell	961	GTCACGAGCAACACATGGTTGTTTCAACAGCTCAAGGATTTTGGTTACTTCAACCATAATGATGTGTACAAGTGAATCGCAATCGGATGATATACAGCAAACTCTCGGATGCATACAGGCCA	1080
3rd Cell	961	GTCACGAGCAACACATGGTTGTTTCAACAGCTCAAGGATTTTGGTTACTTCAACCATAATGATGTGTACAAGTGAATCGCAATCGGATGATATACAGCAAACTCTCGGATGCATACAGGCCA	1080
Plasmid	1081	CCTAAATCTCAGGAAGGTTATGGGTACAAGGCATCCTATTGTGCCAGTTTCACTGAGACCTGATCCTGGCTGTCGCTTAAAGTGTTCAATACAGCAATGTGATGATGGGGGAGAA	1200
Egg	1081	CCTAAATCTCAGGAAGGTTATGGGTACAAGGCATCCTATTGTGCCAGTTTCACTGAGACCTGATCCTGGCTGTCGCTTAAAGTGTTCAATACAGCAATGTGATGATGGGGGAGAA	1200
1st Cell	1081	CCTAAATCTCAGGAAGGTTATGGGTACAAGGCATCCTATTGTGCCAGTTTCACTGAGACCTGATCCTGGCTGTCGCTTAAAGTGTTCAATACAGCAATGTGATGATGGGGGAGAA	1200
2nd Cell	1081	CCTAAATCTCAGGAAGGTTATGGGTACAAGGCATCCTATTGTGCCAGTTTCACTGAGACCTGATCCTGGCTGTCGCTTAAAGTGTTCAATACAGCAATGTGATGATGGGGGAGAA	1200
3rd Cell	1081	CCTAAATCTCAGGAAGGTTATGGGTACAAGGCATCCTATTGTGCCAGTTTCACTGAGACCTGATCCTGGCTGTCGCTTAAAGTGTTCAATACAGCAATGTGATGATGGGGGAGAA	1200
Plasmid	1201	GCGAGGTTGATCCAAGTAGGCTCAACCGTGATCTATACCAACGCTCATCCTCATGGTGGGTGGTAGGACTGACTTACAATATAGATGTGTGAGAATAACTTCACAGACAGGTAACACA	1320
Egg	1201	GCGAGGTTGATCCAAGTAGGCTCAACCGTGATCTATACCAACGCTCATCCTCATGGTGGGTGGTAGGACTGACTTACAATATAGATGTGTGAGAATAACTTCACAGACAGGTAACACA	1320
1st Cell	1201	GCGAGGTTGATCCAAGTAGGCTCAACCGTGATCTATACCAACGCTCATCCTCATGGTGGGTGGTAGGACTGACTTACAATATAGATGTGTGAGAATAACTTCACAGACAGGTAACACA	1320
2nd Cell	1201	GCGAGGTTGATCCAAGTAGGCTCAACCGTGATCTATACCAACGCTCATCCTCATGGTGGGTGGTAGGACTGACTTACAATATAGATGTGTGAGAATAACTTCACAGACAGGTAACACA	1320
3rd Cell	1201	GCGAGGTTGATCCAAGTAGGCTCAACCGTGATCTATACCAACGCTCATCCTCATGGTGGGTGGTAGGACTGACTTACAATATAGATGTGTGAGAATAACTTCACAGACAGGTAACACA	1320
Plasmid	1321	CTCAACCATGTAGACCCCATTTGCCATACAAAGTTCCCAAGACCATTCTTCGGGGAGAGTGCCTGTGCGAGGCCAAACATATGCGCTGCTGTCTGTCTCGGAGTTTATCAGGACATT	1440
Egg	1321	CTCAACCATGTAGACCCCATTTGCCATACAAAGTTCCCAAGACCATTCTTCGGGGAGAGTGCCTGTGCGAGGCCAAACATATGCGCTGCTGTCTGTCTCGGAGTTTATCAGGACATT	1440
1st Cell	1321	CTCAACCATGTAGACCCCATTTGCCATACAAAGTTCCCAAGACCATTCTTCGGGGAGAGTGCCTGTGCGAGGCCAAACATATGCGCTGCTGTCTGTCTCGGAGTTTATCAGGACATT	1440
2nd Cell	1321	CTCAACCATGTAGACCCCATTTGCCATACAAAGTTCCCAAGACCATTCTTCGGGGAGAGTGCCTGTGCGAGGCCAAACATATGCGCTGCTGTCTGTCTCGGAGTTTATCAGGACATT	1440
3rd Cell	1321	CTCAACCATGTAGACCCCATTTGCCATACAAAGTTCCCAAGACCATTCTTCGGGGAGAGTGCCTGTGCGAGGCCAAACATATGCGCTGCTGTCTGTCTCGGAGTTTATCAGGACATT	1440
Plasmid	1441	TGGCCGATCAGTACAGCCACCAATAACAGCAACATTGTGGTGGTGGACAGTACTTAGAAGCATCTTATTCAGGAAATACCCAAGAATAGGGATAGCAACCCAGTATGAGTGGAAAGTC	1560
Egg	1441	TGGCCGATCAGTACAGCCACCAATAACAGCAACATTGTGGTGGTGGACAGTACTTAGAAGCATCTTATTCAGGAAATACCCAAGAATAGGGATAGCAACCCAGTATGAGTGGAAAGTC	1560
1st Cell	1441	TGGCCGATCAGTACAGCCACCAATAACAGCAACATTGTGGTGGTGGACAGTACTTAGAAGCATCTTATTCAGGAAATACCCAAGAATAGGGATAGCAACCCAGTATGAGTGGAAAGTC	1560
2nd Cell	1441	TGGCCGATCAGTACAGCCACCAATAACAGCAACATTGTGGTGGTGGACAGTACTTAGAAGCATCTTATTCAGGAAATACCCAAGAATAGGGATAGCAACCCAGTATGAGTGGAAAGTC	1560
3rd Cell	1441	TGGCCGATCAGTACAGCCACCAATAACAGCAACATTGTGGTGGTGGACAGTACTTAGAAGCATCTTATTCAGGAAATACCCAAGAATAGGGATAGCAACCCAGTATGAGTGGAAAGTC	1560
Plasmid	1561	ACCAACCAAGCTGTTCAATTGCAATCTGAGGAGGGGTACTCAACCAACAACATGCTTCCGGAACACCAACCGGCAAGGCATATTGTTGATGTATATCAGAGTACGCTGATGGGGTGTTC	1680
Egg	1561	ACCAACCAAGCTGTTCAATTGCAATCTGAGGAGGGGTACTCAACCAACAACATGCTTCCGGAACACCAACCGGCAAGGCATATTGTTGATGTATATCAGAGTACGCTGATGGGGTGTTC	1680
1st Cell	1561	ACCAACCAAGCTGTTCAATTGCAATCTGAGGAGGGGTACTCAACCAACAACATGCTTCCGGAACACCAACCGGCAAGGCATATTGTTGATGTATATCAGAGTACGCTGATGGGGTGTTC	1680
2nd Cell	1561	ACCAACCAAGCTGTTCAATTGCAATCTGAGGAGGGGTACTCAACCAACAACATGCTTCCGGAACACCAACCGGCAAGGCATATTGTTGATGTATATCAGAGTACGCTGATGGGGTGTTC	1680
3rd Cell	1561	ACCAACCAAGCTGTTCAATTGCAATCTGAGGAGGGGTACTCAACCAACAACATGCTTCCGGAACACCAACCGGCAAGGCATATTGTTGATGTATATCAGAGTACGCTGATGGGGTGTTC	1680
Plasmid	1681	GGATCATACAGGATCGTTCCTCAGCTTATAGAGATTAGAAGCAGCACCCGGTAAATCTGAGTGA	1743
Egg	1681	GGATCATACAGGATCGTTCCTCAGCTTATAGAGATTAGAAGCAGCACCCGGTAAATCTGAGTGA	1743
1st Cell	1681	GGATCATACAGGATCGTTCCTCAGCTTATAGAGATTAGAAGCAGCACCCGGTAAATCTGAGTGA	1743
2nd Cell	1681	GGATCATACAGGATCGTTCCTCAGCTTATAGAGATTAGAAGCAGCACCCGGTAAATCTGAGTGA	1743
3rd Cell	1681	GGATCATACAGGATCGTTCCTCAGCTTATAGAGATTAGAAGCAGCACCCGGTAAATCTGAGTGA	1743

Plasmid : Plasmids for rescue experiments  
 Egg : Viruses were propagated in embryonated eggs  
 1st Cell :  
 2nd Cell :  
 3rd Cell : Each passage viruses in HEp-2 cells

# rNDV-2F/2HN (APMV-2 F gene)

Plasmid	1	ATGAATCAAGCACTCGTGATTTTGTGGTATCTTCCAGCTCGCGGTTGCCTTAGATAACTCAGTGTGGCTCCAATAGGAGTAGCTAGCGCAGGAGTGGAACCTGGCGGCATATACA	120
Egg	1	ATGAATCAAGCACTCGTGATTTTGTGGTATCTTCCAGCTCGCGGTTGCCTTAGATAACTCAGTGTGGCTCCAATAGGAGTAGCTAGCGCAGGAGTGGAACCTGGCGGCATATACA	120
1st Cell	1	ATGAATCAAGCACTCGTGATTTTGTGGTATCTTCCAGCTCGCGGTTGCCTTAGATAACTCAGTGTGGCTCCAATAGGAGTAGCTAGCGCAGGAGTGGAACCTGGCGGCATATACA	120
2nd Cell	1	ATGAATCAAGCACTCGTGATTTTGTGGTATCTTCCAGCTCGCGGTTGCCTTAGATAACTCAGTGTGGCTCCAATAGGAGTAGCTAGCGCAGGAGTGGAACCTGGCGGCATATACA	120
3rd Cell	1	ATGAATCAAGCACTCGTGATTTTGTGGTATCTTCCAGCTCGCGGTTGCCTTAGATAACTCAGTGTGGCTCCAATAGGAGTAGCTAGCGCAGGAGTGGAACCTGGCGGCATATACA	120
Plasmid	121	ACGACCCTCACAGGGACCATCGCAGTGAGATTTATCCCGGTCCTGCCTGGGAACCTATCAACATGTGCACAGGAGACGCTGCAGGAATATAATAGAAGTGTGACTAATATCTTAGGCCCG	240
Egg	121	ACGACCCTCACAGGGACCATCGCAGTGAGATTTATCCCGGTCCTGCCTGGGAACCTATCAACATGTGCACAGGAGACGCTGCAGGAATATAATAGAAGTGTGACTAATATCTTAGGCCCG	240
1st Cell	121	ACGACCCTCACAGGGACCATCGCAGTGAGATTTATCCCGGTCCTGCCTGGGAACCTATCAACATGTGCACAGGAGACGCTGCAGGAATATAATAGAAGTGTGACTAATATCTTAGGCCCG	240
2nd Cell	121	ACGACCCTCACAGGGACCATCGCAGTGAGATTTATCCCGGTCCTGCCTGGGAACCTATCAACATGTGCACAGGAGACGCTGCAGGAATATAATAGAAGTGTGACTAATATCTTAGGCCCG	240
3rd Cell	121	ACGACCCTCACAGGGACCATCGCAGTGAGATTTATCCCGGTCCTGCCTGGGAACCTATCAACATGTGCACAGGAGACGCTGCAGGAATATAATAGAAGTGTGACTAATATCTTAGGCCCG	240
Plasmid	241	TTGAGAGAGAAGTGTGATGCTCTCCTATCTGACTTCGATAAACCTGCATCGAGGTCGTGGGCGCCATTCATTTGGGTCGGTGGCTTGGGGGTAGCAACAGCTGCACAAATCACAGCGCC	360
Egg	241	TTGAGAGAGAAGTGTGATGCTCTCCTATCTGACTTCGATAAACCTGCATCGAGGTCGTGGGCGCCATTCATTTGGGTCGGTGGCTTGGGGGTAGCAACAGCTGCACAAATCACAGCGCC	360
1st Cell	241	TTGAGAGAGAAGTGTGATGCTCTCCTATCTGACTTCGATAAACCTGCATCGAGGTCGTGGGCGCCATTCATTTGGGTCGGTGGCTTGGGGGTAGCAACAGCTGCACAAATCACAGCGCC	360
2nd Cell	241	TTGAGAGAGAAGTGTGATGCTCTCCTATCTGACTTCGATAAACCTGCATCGAGGTCGTGGGCGCCATTCATTTGGGTCGGTGGCTTGGGGGTAGCAACAGCTGCACAAATCACAGCGCC	360
3rd Cell	241	TTGAGAGAGAAGTGTGATGCTCTCCTATCTGACTTCGATAAACCTGCATCGAGGTCGTGGGCGCCATTCATTTGGGTCGGTGGCTTGGGGGTAGCAACAGCTGCACAAATCACAGCGCC	360
Plasmid	361	GTGGCTCTCAATCAAGCACAAGAGAATGCCCGGAATATATGGCGTCTCAAGGAATCGATAAAGAAAACCAATGAGGCTGTGTTGGAATTGAAGGAAGGACTTGCAACGACTGCTATAGCT	480
Egg	361	GTGGCTCTCAATCAAGCACAAGAGAATGCCCGGAATATATGGCGTCTCAAGGAATCGATAAAGAAAACCAATGAGGCTGTGTTGGAATTGAAGGAAGGACTTGCAACGACTGCTATAGCT	480
1st Cell	361	GTGGCTCTCAATCAAGCACAAGAGAATGCCCGGAATATATGGCGTCTCAAGGAATCGATAAAGAAAACCAATGAGGCTGTGTTGGAATTGAAGGAAGGACTTGCAACGACTGCTATAGCT	480
2nd Cell	361	GTGGCTCTCAATCAAGCACAAGAGAATGCCCGGAATATATGGCGTCTCAAGGAATCGATAAAGAAAACCAATGAGGCTGTGTTGGAATTGAAGGAAGGACTTGCAACGACTGCTATAGCT	480
3rd Cell	361	GTGGCTCTCAATCAAGCACAAGAGAATGCCCGGAATATATGGCGTCTCAAGGAATCGATAAAGAAAACCAATGAGGCTGTGTTGGAATTGAAGGAAGGACTTGCAACGACTGCTATAGCT	480
Plasmid	481	TTGGACAAAGTGCAAAAGTTTATCAATGATGATATTATACCACAGATTAAGGACATTGACTGCCAGGTAGTTGCAAAATAAATAGGCGTCTACCTCTCCTTATACTTAACAGAGCTTACA	600
Egg	481	TTGGACAAAGTGCAAAAGTTTATCAATGATGATATTATACCACAGATTAAGGACATTGACTGCCAGGTAGTTGCAAAATAAATAGGCGTCTACCTCTCCTTATACTTAACAGAGCTTACA	600
1st Cell	481	TTGGACAAAGTGCAAAAGTTTATCAATGATGATATTATACCACAGATTAAGGACATTGACTGCCAGGTAGTTGCAAAATAAATAGGCGTCTACCTCTCCTTATACTTAACAGAGCTTACA	600
2nd Cell	481	TTGGACAAAGTGCAAAAGTTTATCAATGATGATATTATACCACAGATTAAGGACATTGACTGCCAGGTAGTTGCAAAATAAATAGGCGTCTACCTCTCCTTATACTTAACAGAGCTTACA	600
3rd Cell	481	TTGGACAAAGTGCAAAAGTTTATCAATGATGATATTATACCACAGATTAAGGACATTGACTGCCAGGTAGTTGCAAAATAAATAGGCGTCTACCTCTCCTTATACTTAACAGAGCTTACA	600
Plasmid	601	ACTGTATTGGTTCTCAGATCACTAATCCTGCATTATCAACGCTCTCTTACCAGGCGCTGTACAGCTTATGTGGAGGGGATATGGGAAAGCTAAGTACGCTGATCGGTGTCAATGCAAA	720
Egg	601	ACTGTATTGGTTCTCAGATCACTAATCCTGCATTATCAACGCTCTCTTACCAGGCGCTGTACAGCTTATGTGGAGGGGATATGGGAAAGCTAAGTACGCTGATCGGTGTCAATGCAAA	720
1st Cell	601	ACTGTATTGGTTCTCAGATCACTAATCCTGCATTATCAACGCTCTCTTACCAGGCGCTGTACAGCTTATGTGGAGGGGATATGGGAAAGCTAAGTACGCTGATCGGTGTCAATGCAAA	720
2nd Cell	601	ACTGTATTGGTTCTCAGATCACTAATCCTGCATTATCAACGCTCTCTTACCAGGCGCTGTACAGCTTATGTGGAGGGGATATGGGAAAGCTAAGTACGCTGATCGGTGTCAATGCAAA	720
3rd Cell	601	ACTGTATTGGTTCTCAGATCACTAATCCTGCATTATCAACGCTCTCTTACCAGGCGCTGTACAGCTTATGTGGAGGGGATATGGGAAAGCTAAGTACGCTGATCGGTGTCAATGCAAA	720
Plasmid	721	GATGTGGGATCCCTCTACGAGGCTAACCTCATAACCGGCCAAATCGTTGGATATGACCTGAACACAGATAATCCTCATACAAGTATCTTACCAGGAGTGTGCTGAAGTGACAGGAGTC	840
Egg	721	GATGTGGGATCCCTCTACGAGGCTAACCTCATAACCGGCCAAATCGTTGGATATGACCTGAACACAGATAATCCTCATACAAGTATCTTACCAGGAGTGTGCTGAAGTGACAGGAGTC	840
1st Cell	721	GATGTGGGATCCCTCTACGAGGCTAACCTCATAACCGGCCAAATCGTTGGATATGACCTGAACACAGATAATCCTCATACAAGTATCTTACCAGGAGTGTGCTGAAGTGACAGGAGTC	840
2nd Cell	721	GATGTGGGATCCCTCTACGAGGCTAACCTCATAACCGGCCAAATCGTTGGATATGACCTGAACACAGATAATCCTCATACAAGTATCTTACCAGGAGTGTGCTGAAGTGACAGGAGTC	840
3rd Cell	721	GATGTGGGATCCCTCTACGAGGCTAACCTCATAACCGGCCAAATCGTTGGATATGACCTGAACACAGATAATCCTCATACAAGTATCTTACCAGGAGTGTGCTGAAGTGACAGGAGTC	840
Plasmid	841	CGGGCTACTGAGTTAGTCACTGTCTCAGTGTCTACTACACAAAAGGAGAAGGGCAGGCAATTGTTCCGAGATATGTGGCAGAGTAGAGTGTGACAGAGGAGTTGGATGTCTCGACTTGT	960
Egg	841	CGGGCTACTGAGTTAGTCACTGTCTCAGTGTCTACTACACAAAAGGAGAAGGGCAGGCAATTGTTCCGAGATATGTGGCAGAGTAGAGTGTGACAGAGGAGTTGGATGTCTCGACTTGT	960
1st Cell	841	CGGGCTACTGAGTTAGTCACTGTCTCAGTGTCTACTACACAAAAGGAGAAGGGCAGGCAATTGTTCCGAGATATGTGGCAGAGTAGAGTGTGACAGAGGAGTTGGATGTCTCGACTTGT	960
2nd Cell	841	CGGGCTACTGAGTTAGTCACTGTCTCAGTGTCTACTACACAAAAGGAGAAGGGCAGGCAATTGTTCCGAGATATGTGGCAGAGTAGAGTGTGACAGAGGAGTTGGATGTCTCGACTTGT	960
3rd Cell	841	CGGGCTACTGAGTTAGTCACTGTCTCAGTGTCTACTACACAAAAGGAGAAGGGCAGGCAATTGTTCCGAGATATGTGGCAGAGTAGAGTGTGACAGAGGAGTTGGATGTCTCGACTTGT	960
Plasmid	961	AGGTTTAGCAAAACAACCTCTTTATTGTAGGTGCATTCTCACACGGGCCCTACCAACTTTGATGCCAGCTGCCTGTGTCAGGGAAGTACGACGATTGTGAGTACACACAGAGATAGGAGCG	1080
Egg	961	AGGTTTAGCAAAACAACCTCTTTATTGTAGGTGCATTCTCACACGGGCCCTACCAACTTTGATGCCAGCTGCCTGTGTCAGGGAAGTACGACGATTGTGAGTACACACAGAGATAGGAGCG	1080
1st Cell	961	AGGTTTAGCAAAACAACCTCTTTATTGTAGGTGCATTCTCACACGGGCCCTACCAACTTTGATGCCAGCTGCCTGTGTCAGGGAAGTACGACGATTGTGAGTACACACAGAGATAGGAGCG	1080
2nd Cell	961	AGGTTTAGCAAAACAACCTCTTTATTGTAGGTGCATTCTCACACGGGCCCTACCAACTTTGATGCCAGCTGCCTGTGTCAGGGAAGTACGACGATTGTGAGTACACACAGAGATAGGAGCG	1080
3rd Cell	961	AGGTTTAGCAAAACAACCTCTTTATTGTAGGTGCATTCTCACACGGGCCCTACCAACTTTGATGCCAGCTGCCTGTGTCAGGGAAGTACGACGATTGTGAGTACACACAGAGATAGGAGCG	1080
Plasmid	1081	CTATCTTCGAGATTTCATCACAGTCAATGGTGGAGTCCTTGCAAACTGCAGAGCAATTGTGTGAAGTGTGTCTACCCCGGCATATAATACCACAAAACGACATTGGCTCCGTAAACAGTT	1200
Egg	1081	CTATCTTCGAGATTTCATCACAGTCAATGGTGGAGTCCTTGCAAACTGCAGAGCAATTGTGTGAAGTGTGTCTACCCCGGCATATAATACCACAAAACGACATTGGCTCCGTAAACAGTT	1200
1st Cell	1081	CTATCTTCGAGATTTCATCACAGTCAATGGTGGAGTCCTTGCAAACTGCAGAGCAATTGTGTGAAGTGTGTCTACCCCGGCATATAATACCACAAAACGACATTGGCTCCGTAAACAGTT	1200
2nd Cell	1081	CTATCTTCGAGATTTCATCACAGTCAATGGTGGAGTCCTTGCAAACTGCAGAGCAATTGTGTGAAGTGTGTCTACCCCGGCATATAATACCACAAAACGACATTGGCTCCGTAAACAGTT	1200
3rd Cell	1081	CTATCTTCGAGATTTCATCACAGTCAATGGTGGAGTCCTTGCAAACTGCAGAGCAATTGTGTGAAGTGTGTCTACCCCGGCATATAATACCACAAAACGACATTGGCTCCGTAAACAGTT	1200
Plasmid	1201	ATTGACTCAAGTATATGCAAGGAAGTTGTCTTAGAGAGTGTGCAGCTTAGGTTAGAAGGAAAGCTGTATCCCAATCTTCTCCAACGTGACAAATTGACCTTTCCCAATCACAACTCA	1320
Egg	1201	ATTGACTCAAGTATATGCAAGGAAGTTGTCTTAGAGAGTGTGCAGCTTAGGTTAGAAGGAAAGCTGTATCCCAATCTTCTCCAACGTGACAAATTGACCTTTCCCAATCACAACTCA	1320
1st Cell	1201	ATTGACTCAAGTATATGCAAGGAAGTTGTCTTAGAGAGTGTGCAGCTTAGGTTAGAAGGAAAGCTGTATCCCAATCTTCTCCAACGTGACAAATTGACCTTTCCCAATCACAACTCA	1320
2nd Cell	1201	ATTGACTCAAGTATATGCAAGGAAGTTGTCTTAGAGAGTGTGCAGCTTAGGTTAGAAGGAAAGCTGTATCCCAATCTTCTCCAACGTGACAAATTGACCTTTCCCAATCACAACTCA	1320
3rd Cell	1201	ATTGACTCAAGTATATGCAAGGAAGTTGTCTTAGAGAGTGTGCAGCTTAGGTTAGAAGGAAAGCTGTATCCCAATCTTCTCCAACGTGACAAATTGACCTTTCCCAATCACAACTCA	1320
Plasmid	1321	GGGTCGCTGGATATAAGCAGTGAATTTGGTAGCATTAACAACACAGTTAATCGGGTCGACGAGTTAATCAAGGAATCCAACGAGTGGCTGAACGCTGTGAACCCCGCCTTGTGAACAA	1440
Egg	1321	GGGTCGCTGGATATAAGCAGTGAATTTGGTAGCATTAACAACACAGTTAATCGGGTCGACGAGTTAATCAAGGAATCCAACGAGTGGCTGAACGCTGTGAACCCCGCCTTGTGAACAA	1440
1st Cell	1321	GGGTCGCTGGATATAAGCAGTGAATTTGGTAGCATTAACAACACAGTTAATCGGGTCGACGAGTTAATCAAGGAATCCAACGAGTGGCTGAACGCTGTGAACCCCGCCTTGTGAACAA	1440
2nd Cell	1321	GGGTCGCTGGATATAAGCAGTGAATTTGGTAGCATTAACAACACAGTTAATCGGGTCGACGAGTTAATCAAGGAATCCAACGAGTGGCTGAACGCTGTGAACCCCGCCTTGTGAACAA	1440
3rd Cell	1321	GGGTCGCTGGATATAAGCAGTGAATTTGGTAGCATTAACAACACAGTTAATCGGGTCGACGAGTTAATCAAGGAATCCAACGAGTGGCTGAACGCTGTGAACCCCGCCTTGTGAACAA	1440
Plasmid	1441	ACGAGCATCGTAGTCTCTGTGTCCTTGCCTGCCCTGATTATTGTCTGGCTAATAGCGCTGACAGTATGCTTCTGTACTCCGCAAGATACCTACGCTAAGTCAAAACAGATGAGGGCGCT	1560
Egg	1441	ACGAGCATCGTAGTCTCTGTGTCCTTGCCTGCCCTGATTATTGTCTGGCTAATAGCGCTGACAGTATGCTTCTGTACTCCGCAAGATACCTACGCTAAGTCAAAACAGATGAGGGCGCT	1560
1st Cell	1441	ACGAGCATCGTAGTCTCTGTGTCCTTGCCTGCCCTGATTATTGTCTGGCTAATAGCGCTGACAGTATGCTTCTGTACTCCGCAAGATACCTACGCTAAGTCAAAACAGATGAGGGCGCT	1560
2nd Cell	1441	ACGAGCATCGTAGTCTCTGTGTCCTTGCCTGCCCTGATTATTGTCTGGCTAATAGCGCTGACAGTATGCTTCTGTACTCCGCAAGATACCTACGCTAAGTCAAAACAGATGAGGGCGCT	1560
3rd Cell	1441	ACGAGCATCGTAGTCTCTGTGTCCTTGCCTGCCCTGATTATTGTCTGGCTAATAGCGCTGACAGTATGCTTCTGTACTCCGCAAGATACCTACGCTAAGTCAAAACAGATGAGGGCGCT	1560
Plasmid	1561	ATGACAGGGATCGATAGTCCATATGTAATACAGAGTGCAACTAAGATGTAG	1611
Egg	1561	ATGACAGGGATCGATAGTCCATATGTAATACAGAGTGCAACTAAGATGTAG	1611
1st Cell	1561	ATGACAGGGATCGATAGTCCATATGTAATACAGAGTGCAACTAAGATGTAG	1611
2nd Cell	1561	ATGACAGGGATCGATAGTCCATATGTAATACAGAGTGCAACTAAGATGTAG	1611
3rd Cell	1561	ATGACAGGGATCGATAGTCCATATGTAATACAGAGTGCAACTAAGATGTAG	1611

Plasmid : Plasmids for rescue experiments  
 Egg : Viruses were propagated in embryonated eggs  
 1st Cell :  
 2nd Cell :  
 3rd Cell : Each passage viruses in HEp-2 cells

## rNDV-2F/2HN (APMV-2 HN gene)

Plasmid	1	ATGGATTTCCCATCTAGGAGAACCTGGCAGCAGGTGACATATCGGGGGCGGAAGACTTTGGAGATTACTGTTCGGGATCCTCACAATTGAGCATAGGTGTGGTCTGTCTTGCCATCAATATT	120
Egg	1	ATGGATTTCCCATCTAGGAGAACCTGGCAGCAGGTGACATATCGGGGGCGGAAGACTTTGGAGATTACTGTTCGGGATCCTCACAATTGAGCATAGGTGTGGTCTGTCTTGCCATCAATATT	120
1st Cell	1	ATGGATTTCCCATCTAGGAGAACCTGGCAGCAGGTGACATATCGGGGGCGGAAGACTTTGGAGATTACTGTTCGGGATCCTCACAATTGAGCATAGGTGTGGTCTGTCTTGCCATCAATATT	120
2nd Cell	1	ATGGATTTCCCATCTAGGAGAACCTGGCAGCAGGTGACATATCGGGGGCGGAAGACTTTGGAGATTACTGTTCGGGATCCTCACAATTGAGCATAGGTGTGGTCTGTCTTGCCATCAATATT	120
3rd Cell	1	ATGGATTTCCCATCTAGGAGAACCTGGCAGCAGGTGACATATCGGGGGCGGAAGACTTTGGAGATTACTGTTCGGGATCCTCACAATTGAGCATAGGTGTGGTCTGTCTTGCCATCAATATT	120
Plasmid	121	GCCACAATTGCAAAATGGATCACCTGGATAACATGGCTTCGAACACATGGACAACAACCTGAGGCTGACCGTGTGATATCTAGCATCAGCACTCCGCTCAAAGTCCCTGTCAACCAGATT	240
Egg	121	GCCACAATTGCAAAATGGATCACCTGGATAACATGGCTTCGAACACATGGACAACAACCTGAGGCTGACCGTGTGATATCTAGCATCAGCACTCCGCTCAAAGTCCCTGTCAACCAGATT	240
1st Cell	121	GCCACAATTGCAAAATGGATCACCTGGATAACATGGCTTCGAACACATGGACAACAACCTGAGGCTGACCGTGTGATATCTAGCATCAGCACTCCGCTCAAAGTCCCTGTCAACCAGATT	240
2nd Cell	121	GCCACAATTGCAAAATGGATCACCTGGATAACATGGCTTCGAACACATGGACAACAACCTGAGGCTGACCGTGTGATATCTAGCATCAGCACTCCGCTCAAAGTCCCTGTCAACCAGATT	240
3rd Cell	121	GCCACAATTGCAAAATGGATCACCTGGATAACATGGCTTCGAACACATGGACAACAACCTGAGGCTGACCGTGTGATATCTAGCATCAGCACTCCGCTCAAAGTCCCTGTCAACCAGATT	240
Plasmid	241	AATGACATGTTTCGGATTGTAGCGCTTGACCTACCTCTGCAGATGACATCATTACAGAAAGAAACAGCATCCCAAGTCGGGTCTTGGCTGAAAGTATCAACAATGTTTATCCAAGAAT	360
Egg	241	AATGACATGTTTCGGATTGTAGCGCTTGACCTACCTCTGCAGATGACATCATTACAGAAAGAAACAGCATCCCAAGTCGGGTCTTGGCTGAAAGTATCAACAATGTTTATCCAAGAAT	360
1st Cell	241	AATGACATGTTTCGGATTGTAGCGCTTGACCTACCTCTGCAGATGACATCATTACAGAAAGAAACAGCATCCCAAGTCGGGTCTTGGCTGAAAGTATCAACAATGTTTATCCAAGAAT	360
2nd Cell	241	AATGACATGTTTCGGATTGTAGCGCTTGACCTACCTCTGCAGATGACATCATTACAGAAAGAAACAGCATCCCAAGTCGGGTCTTGGCTGAAAGTATCAACAATGTTTATCCAAGAAT	360
3rd Cell	241	AATGACATGTTTCGGATTGTAGCGCTTGACCTACCTCTGCAGATGACATCATTACAGAAAGAAACAGCATCCCAAGTCGGGTCTTGGCTGAAAGTATCAACAATGTTTATCCAAGAAT	360
Plasmid	361	GGATCTGCGAGCGCTGGTCTTGTGTAATGACCTGAATATGACGGGGGGATCGCTGTGACGTTGTACCAAGGAGATGCATCTGCGAGGCTAAATTTCCAGGCCATTTCTTTAATAGAACAT	480
Egg	361	GGATCTGCGAGCGCTGGTCTTGTGTAATGACCTGAATATGACGGGGGGATCGCTGTGACGTTGTACCAAGGAGATGCATCTGCGAGGCTAAATTTCCAGGCCATTTCTTTAATAGAACAT	480
1st Cell	361	GGATCTGCGAGCGCTGGTCTTGTGTAATGACCTGAATATGACGGGGGGATCGCTGTGACGTTGTACCAAGGAGATGCATCTGCGAGGCTAAATTTCCAGGCCATTTCTTTAATAGAACAT	480
2nd Cell	361	GGATCTGCGAGCGCTGGTCTTGTGTAATGACCTGAATATGACGGGGGGATCGCTGTGACGTTGTACCAAGGAGATGCATCTGCGAGGCTAAATTTCCAGGCCATTTCTTTAATAGAACAT	480
3rd Cell	361	GGATCTGCGAGCGCTGGTCTTGTGTAATGACCTGAATATGACGGGGGGATCGCTGTGACGTTGTACCAAGGAGATGCATCTGCGAGGCTAAATTTCCAGGCCATTTCTTTAATAGAACAT	480
Plasmid	481	CCAAGTTTTGTCCTGGTCTCTACTGCTAAGGGCTGTATAAGGATCCCGACCTTCCATATGGGCCCTTCACATTTGGTGTACTACATAAACATCATTGCATCAGGTTGCCAGGATGCG	600
Egg	481	CCAAGTTTTGTCCTGGTCTCTACTGCTAAGGGCTGTATAAGGATCCCGACCTTCCATATGGGCCCTTCACATTTGGTGTACTACATAAACATCATTGCATCAGGTTGCCAGGATGCG	600
1st Cell	481	CCAAGTTTTGTCCTGGTCTCTACTGCTAAGGGCTGTATAAGGATCCCGACCTTCCATATGGGCCCTTCACATTTGGTGTACTACATAAACATCATTGCATCAGGTTGCCAGGATGCG	600
2nd Cell	481	CCAAGTTTTGTCCTGGTCTCTACTGCTAAGGGCTGTATAAGGATCCCGACCTTCCATATGGGCCCTTCACATTTGGTGTACTACATAAACATCATTGCATCAGGTTGCCAGGATGCG	600
3rd Cell	481	CCAAGTTTTGTCCTGGTCTCTACTGCTAAGGGCTGTATAAGGATCCCGACCTTCCATATGGGCCCTTCACATTTGGTGTACTACATAAACATCATTGCATCAGGTTGCCAGGATGCG	600
Plasmid	601	AGCCACTCCAGTATGTATATCTCTCGGGGTGCTGAAAGCATCGCAGACCGGGTCGCCATCTCTTTCGACAACCGGCCAGCCAGCTCGTGGATGACAACATCAACCGGAAGTCATGCAGC	720
Egg	601	AGCCACTCCAGTATGTATATCTCTCGGGGTGCTGAAAGCATCGCAGACCGGGTCGCCATCTCTTTCGACAACCGGCCAGCCAGCTCGTGGATGACAACATCAACCGGAAGTCATGCAGC	720
1st Cell	601	AGCCACTCCAGTATGTATATCTCTCGGGGTGCTGAAAGCATCGCAGACCGGGTCGCCATCTCTTTCGACAACCGGCCAGCCAGCTCGTGGATGACAACATCAACCGGAAGTCATGCAGC	720
2nd Cell	601	AGCCACTCCAGTATGTATATCTCTCGGGGTGCTGAAAGCATCGCAGACCGGGTCGCCATCTCTTTCGACAACCGGCCAGCCAGCTCGTGGATGACAACATCAACCGGAAGTCATGCAGC	720
3rd Cell	601	AGCCACTCCAGTATGTATATCTCTCGGGGTGCTGAAAGCATCGCAGACCGGGTCGCCATCTCTTTCGACAACCGGCCAGCCAGCTCGTGGATGACAACATCAACCGGAAGTCATGCAGC	720
Plasmid	721	ATCGTAGGCTCAAAATACGGTTGTGATATCTCTATGCAGTATTGTGATTGAAACAGAGGATGAGGATTATAGGTCGTATCCGGCTACTAGCATGATTATAGGTAGGCTGTTCTTCAACGGG	840
Egg	721	ATCGTAGGCTCAAAATACGGTTGTGATATCTCTATGCAGTATTGTGATTGAAACAGAGGATGAGGATTATAGGTCGTATCCGGCTACTAGCATGATTATAGGTAGGCTGTTCTTCAACGGG	840
1st Cell	721	ATCGTAGGCTCAAAATACGGTTGTGATATCTCTATGCAGTATTGTGATTGAAACAGAGGATGAGGATTATAGGTCGTATCCGGCTACTAGCATGATTATAGGTAGGCTGTTCTTCAACGGG	840
2nd Cell	721	ATCGTAGGCTCAAAATACGGTTGTGATATCTCTATGCAGTATTGTGATTGAAACAGAGGATGAGGATTATAGGTCGTATCCGGCTACTAGCATGATTATAGGTAGGCTGTTCTTCAACGGG	840
3rd Cell	721	ATCGTAGGCTCAAAATACGGTTGTGATATCTCTATGCAGTATTGTGATTGAAACAGAGGATGAGGATTATAGGTCGTATCCGGCTACTAGCATGATTATAGGTAGGCTGTTCTTCAACGGG	840
Plasmid	841	TCATACACAGAGAGCAAGATTAAACACAGGGTCCATCTTCAGTCTATTCTCTGCTAACTACCTCGCGGTGGGGTCGGGTATTGTAGTCGGGGATGAAGCCGCATTCCCAATATATGTTGGG	960
Egg	841	TCATACACAGAGAGCAAGATTAAACACAGGGTCCATCTTCAGTCTATTCTCTGCTAACTACCTCGCGGTGGGGTCGGGTATTGTAGTCGGGGATGAAGCCGCATTCCCAATATATGTTGGG	960
1st Cell	841	TCATACACAGAGAGCAAGATTAAACACAGGGTCCATCTTCAGTCTATTCTCTGCTAACTACCTCGCGGTGGGGTCGGGTATTGTAGTCGGGGATGAAGCCGCATTCCCAATATATGTTGGG	960
2nd Cell	841	TCATACACAGAGAGCAAGATTAAACACAGGGTCCATCTTCAGTCTATTCTCTGCTAACTACCTCGCGGTGGGGTCGGGTATTGTAGTCGGGGATGAAGCCGCATTCCCAATATATGTTGGG	960
3rd Cell	841	TCATACACAGAGAGCAAGATTAAACACAGGGTCCATCTTCAGTCTATTCTCTGCTAACTACCTCGCGGTGGGGTCGGGTATTGTAGTCGGGGATGAAGCCGCATTCCCAATATATGTTGGG	960
Plasmid	961	GTCAGCAGAAACACATGGTTGTTCAACACAGCTCAAGGATTTTGGTTACTTCACCCATAATGATGTGTACAAGTGCAATCCGAGCTGATATACAGCAAACTATCTCGGATGCATACAGGCCA	1080
Egg	961	GTCAGCAGAAACACATGGTTGTTCAACACAGCTCAAGGATTTTGGTTACTTCACCCATAATGATGTGTACAAGTGCAATCCGAGCTGATATACAGCAAACTATCTCGGATGCATACAGGCCA	1080
1st Cell	961	GTCAGCAGAAACACATGGTTGTTCAACACAGCTCAAGGATTTTGGTTACTTCACCCATAATGATGTGTACAAGTGCAATCCGAGCTGATATACAGCAAACTATCTCGGATGCATACAGGCCA	1080
2nd Cell	961	GTCAGCAGAAACACATGGTTGTTCAACACAGCTCAAGGATTTTGGTTACTTCACCCATAATGATGTGTACAAGTGCAATCCGAGCTGATATACAGCAAACTATCTCGGATGCATACAGGCCA	1080
3rd Cell	961	GTCAGCAGAAACACATGGTTGTTCAACACAGCTCAAGGATTTTGGTTACTTCACCCATAATGATGTGTACAAGTGCAATCCGAGCTGATATACAGCAAACTATCTCGGATGCATACAGGCCA	1080
Plasmid	1081	CCTAAAATCTCAGGAAGGTTATGGGTACAAGGCATCCTATTGTGCCAGTTTTCAGTGAGACCTGATCCTGGCTGTCGCTTAAAGGTGTTCAATACCAGCAATGTGATGATGGGGGCAGAA	1200
Egg	1081	CCTAAAATCTCAGGAAGGTTATGGGTACAAGGCATCCTATTGTGCCAGTTTTCAGTGAGACCTGATCCTGGCTGTCGCTTAAAGGTGTTCAATACCAGCAATGTGATGATGGGGGCAGAA	1200
1st Cell	1081	CCTAAAATCTCAGGAAGGTTATGGGTACAAGGCATCCTATTGTGCCAGTTTTCAGTGAGACCTGATCCTGGCTGTCGCTTAAAGGTGTTCAATACCAGCAATGTGATGATGGGGGCAGAA	1200
2nd Cell	1081	CCTAAAATCTCAGGAAGGTTATGGGTACAAGGCATCCTATTGTGCCAGTTTTCAGTGAGACCTGATCCTGGCTGTCGCTTAAAGGTGTTCAATACCAGCAATGTGATGATGGGGGCAGAA	1200
3rd Cell	1081	CCTAAAATCTCAGGAAGGTTATGGGTACAAGGCATCCTATTGTGCCAGTTTTCAGTGAGACCTGATCCTGGCTGTCGCTTAAAGGTGTTCAATACCAGCAATGTGATGATGGGGGCAGAA	1200
Plasmid	1201	GCGAGGTTGATCCAAGTAGGCTCAACCGTGATCTATACCAACGCTCATCCTCATGGTGGGTGGTAGGACTGACTTACAAATTAGATGTGTGAGAAATAACTTCACAGACAGGTAAACACA	1320
Egg	1201	GCGAGGTTGATCCAAGTAGGCTCAACCGTGATCTATACCAACGCTCATCCTCATGGTGGGTGGTAGGACTGACTTACAAATTAGATGTGTGAGAAATAACTTCACAGACAGGTAAACACA	1320
1st Cell	1201	GCGAGGTTGATCCAAGTAGGCTCAACCGTGATCTATACCAACGCTCATCCTCATGGTGGGTGGTAGGACTGACTTACAAATTAGATGTGTGAGAAATAACTTCACAGACAGGTAAACACA	1320
2nd Cell	1201	GCGAGGTTGATCCAAGTAGGCTCAACCGTGATCTATACCAACGCTCATCCTCATGGTGGGTGGTAGGACTGACTTACAAATTAGATGTGTGAGAAATAACTTCACAGACAGGTAAACACA	1320
3rd Cell	1201	GCGAGGTTGATCCAAGTAGGCTCAACCGTGATCTATACCAACGCTCATCCTCATGGTGGGTGGTAGGACTGACTTACAAATTAGATGTGTGAGAAATAACTTCACAGACAGGTAAACACA	1320
Plasmid	1321	CTCAACCATGTAGACCCCATTTGCCATACAAAGTTCCCAAGACCATCTTTTCGGGCGAGATGCGTGTGCGAGGCCAAACATATGCCCTGCTGTCTGTCTCCGGAGTTTATCAGGACATT	1440
Egg	1321	CTCAACCATGTAGACCCCATTTGCCATACAAAGTTCCCAAGACCATCTTTTCGGGCGAGATGCGTGTGCGAGGCCAAACATATGCCCTGCTGTCTGTCTCCGGAGTTTATCAGGACATT	1440
1st Cell	1321	CTCAACCATGTAGACCCCATTTGCCATACAAAGTTCCCAAGACCATCTTTTCGGGCGAGATGCGTGTGCGAGGCCAAACATATGCCCTGCTGTCTGTCTCCGGAGTTTATCAGGACATT	1440
2nd Cell	1321	CTCAACCATGTAGACCCCATTTGCCATACAAAGTTCCCAAGACCATCTTTTCGGGCGAGATGCGTGTGCGAGGCCAAACATATGCCCTGCTGTCTGTCTCCGGAGTTTATCAGGACATT	1440
3rd Cell	1321	CTCAACCATGTAGACCCCATTTGCCATACAAAGTTCCCAAGACCATCTTTTCGGGCGAGATGCGTGTGCGAGGCCAAACATATGCCCTGCTGTCTGTCTCCGGAGTTTATCAGGACATT	1440
Plasmid	1441	TGGCCGATCAGTACAGCCACCAATAACAGCAACATTGTGTGGGTGGACAGTACTTAGAAGCATCTTATTCCAGGAAATACCCAAGAATAGGGATAGCAACCCAGTATGAGTGGAAAGTC	1560
Egg	1441	TGGCCGATCAGTACAGCCACCAATAACAGCAACATTGTGTGGGTGGACAGTACTTAGAAGCATCTTATTCCAGGAAATACCCAAGAATAGGGATAGCAACCCAGTATGAGTGGAAAGTC	1560
1st Cell	1441	TGGCCGATCAGTACAGCCACCAATAACAGCAACATTGTGTGGGTGGACAGTACTTAGAAGCATCTTATTCCAGGAAATACCCAAGAATAGGGATAGCAACCCAGTATGAGTGGAAAGTC	1560
2nd Cell	1441	TGGCCGATCAGTACAGCCACCAATAACAGCAACATTGTGTGGGTGGACAGTACTTAGAAGCATCTTATTCCAGGAAATACCCAAGAATAGGGATAGCAACCCAGTATGAGTGGAAAGTC	1560
3rd Cell	1441	TGGCCGATCAGTACAGCCACCAATAACAGCAACATTGTGTGGGTGGACAGTACTTAGAAGCATCTTATTCCAGGAAATACCCAAGAATAGGGATAGCAACCCAGTATGAGTGGAAAGTC	1560
Plasmid	1561	ACCAACACAGCTGTTCAATTGCAATCTGAGGAGGGGTACTCAACCAACAACATGCTTCGGGAACACCAACCGGACAAGGCATATTGTGTAGTGATATCAGAGTACGCTGATGGGGTGTTCT	1680
Egg	1561	ACCAACACAGCTGTTCAATTGCAATCTGAGGAGGGGTACTCAACCAACAACATGCTTCGGGAACACCAACCGGACAAGGCATATTGTGTAGTGATATCAGAGTACGCTGATGGGGTGTTCT	1680
1st Cell	1561	ACCAACACAGCTGTTCAATTGCAATCTGAGGAGGGGTACTCAACCAACAACATGCTTCGGGAACACCAACCGGACAAGGCATATTGTGTAGTGATATCAGAGTACGCTGATGGGGTGTTCT	1680
2nd Cell	1561	ACCAACACAGCTGTTCAATTGCAATCTGAGGAGGGGTACTCAACCAACAACATGCTTCGGGAACACCAACCGGACAAGGCATATTGTGTAGTGATATCAGAGTACGCTGATGGGGTGTTCT	1680
3rd Cell	1561	ACCAACACAGCTGTTCAATTGCAATCTGAGGAGGGGTACTCAACCAACAACATGCTTCGGGAACACCAACCGGACAAGGCATATTGTGTAGTGATATCAGAGTACGCTGATGGGGTGTTCT	1680
Plasmid	1681	GGATCATACAGGATCGTTCTTCAGCTTATAGAGATTAGAAGCAGCCACCGGTAAATCTGAGTGGA	1743
Egg	1681	GGATCATACAGGATCGTTCTTCAGCTTATAGAGATTAGAAGCAGCCACCGGTAAATCTGAGTGGA	1743
1st Cell	1681	GGATCATACAGGATCGTTCTTCAGCTTATAGAGATTAGAAGCAGCCACCGGTAAATCTGAGTGGA	1743
2nd Cell	1681	GGATCATACAGGATCGTTCTTCAGCTTATAGAGATTAGAAGCAGCCACCGGTAAATCTGAGTGGA	1743
3rd Cell	1681	GGATCATACAGGATCGTTCTTCAGCTTATAGAGATTAGAAGCAGCCACCGGTAAATCTGAGTGGA	1743

C

## NDV F protein

## In this study

NDV Hitchner B1 (Accetion no.AF375823)	1	MGSRPSTKNPAPMMLTIRVALVLSICIPANSIDGRPLAAAGIVVTGDKAVNIYTSQTGSIIVKLLPNLPKDKEACAKAPLDAYNRTLTTLLTPLGDSIR	100
NDV Beaudette C (Accetion no.JN872154)	1	MGPRPSTKNPVPMMLTVRVALVLSICIPANSIDGRPLAAAGIVVTGDKAVNIYTSQTGSIIVKLLPNLSKDKEACAKAPLDAYNRTLTTLLTPLGDSIR	100
NDV Hitchner B1 (Accetion no.AF375823)	101	RIQESVTTSGGRQGRRLIGAIIGGVALGVATAAQITAAAALIQKQNAANILRLKESIAATNEAVHEVTDGLSQLAVAVGKMQQFVNDQFNKTAQELDCI	200
NDV Beaudette C (Accetion no.JN872154)	101	RIQESVTTSGGRQGRRLIGAIIGGVALGVATAAQITAAAALIQKQNAANILRLKESIAATNEAVHEVTDGLSQLAVAVGKMQQFVNDQFNKTAQELDCI	200
NDV Hitchner B1 (Accetion no.AF375823)	201	KIAQQVGVELNLYLTELTTFVFGPQITSPALNKLTIQALYNLAGGNMDYLLTKLGTGNNQLSSLIGSGLITGNPILYDSQTQLLGIQVTLPSVGNLNNMRA	300
NDV Beaudette C (Accetion no.JN872154)	201	RIAQQVGVELNLYLTELTTFVFGPQITSPALNKLTIQALYNLAGGNMDYLLTKLGTGNNQLSSLIGSGLITGNPILYDSQTQLLGIQVTLPSVGNLNNMRA	300
NDV Hitchner B1 (Accetion no.AF375823)	301	TYLETLSVSTTRGFASALVPKVVTQVGSVIEELDTSYCIETDLDLYCTRIVTFPMPSPGIYSCLSGNTSACMYSKTEGALTTPYMTIKGSVIANCKMTTCR	400
NDV Beaudette C (Accetion no.JN872154)	301	TYLETLSVSTTRGFASALVPKVVTQVGSVIEELDTSYCIETDLDLYCTRIVTFPMPSPGIYSCLSGNTSACMYSKTEGALTTPYMTIKGSVIANCKMTTCR	400
NDV Hitchner B1 (Accetion no.AF375823)	401	CVNPPGIISQNYGEAVSLIDKQSCNVLSIGGITLRLSGEFDVITYQKNISIQDSQVIITGNLDISTELGNVNNISISNALNKEESNRKLDKVNVKLTSTSA	500
NDV Beaudette C (Accetion no.JN872154)	401	CVNPPGIISQNYGEAVSLIDKQSCNVLSIDGITLRLSGEFDAITYQKNISIQDSQVIITGNLDISTELGNVNNISISNALNKEESNRKLDKVNVKLTSTSA	500
NDV Hitchner B1 (Accetion no.AF375823)	501	LITYIVLTIISLVFGILSLVACYLMYKQKAQQKTLLWLGNNTLDQMRATTKM	553
NDV Beaudette C (Accetion no.JN872154)	501	LITYIVLTIISLVFGILSLVACYLMYKQKAQQKTLLWLGNNTLDQMRATTKM	553

Transmembrane

Endodomain

## NDV HN protein

## In this study

		Endodomain	Transmembrane	
NDV Hitchner B1 (Accetion no.AF375823)	1	MDRAVSQVALENDEREAKNTWRLIFRIAILLTLVVTLATSVASILLYS	4	MGASTPSDLVGIPTRISRAEEKITS
NDV Beaudette C (Accetion no.AF309036)	1	MDRAVSQVALENDEREAKNTWRLIFRIAILLTLVVTLATSVASILLYS	4	MGASTPSDLVGIPTRISRAEEKITS
NDV Hitchner B1 (Accetion no.AF375823)	101	TTIMNAITSLSYQINGAANNNGWGAPIHDPDYIGGIGKELIVDDASDVTSFYPSAFQEHNLNFIAPPTGSGCTRIPSFDMSSATHYCYTHNVILSGCRDHS	200	
NDV Beaudette C (Accetion no.AF309036)	101	TTIMNAITSLSYQINGAANNNGWGAPIHDPDYIGGIGKELIVDDASDVTSFYPSAFQEHNLNFIAPPTGSGCTRIPSFDMSSATHYCYTHNVILSGCRDHS	200	
NDV Hitchner B1 (Accetion no.AF375823)	201	HS HQYLALGLVLRTSATGRVFFSTLRSINLDDTQNRKSCSVSATPLGCDMLCSKATETEEEDYNSAVPTRMVHGRGLGFDGQYHEKDLDVTTLEFDGWVANYP	300	
NDV Beaudette C (Accetion no.AF309036)	201	HS HQYLALGLVLRTSATGRVFFSTLRSINLDDTQNRKSCSVSATPLGCDMLCSKATETEEEDYNSAVPTRMVHGRGLGFDGQYHEKDLDVTTLEFDGWVANYP	300	
NDV Hitchner B1 (Accetion no.AF375823)	301	GVGGGSFIDSRVWFSVYGGGLKPNTPSDTVQEGKYVIYKRYNDTCPDEQDYQIRMAKSSYKPGRGFGGKRIQQAILSIKVSTSLGEDPVLTVPPNTVTLMGA	400	
NDV Beaudette C (Accetion no.AF309036)	301	GVGGGSFIDGRVWFSVYGGGLKPNTPSDTVQEGKYVIYKRYNDTCPDEQDYQIRMAKSSYKPGRGFGGKRIQQAILSIKVSTSLGEDPVLTVPPNTVTLMGA	400	
NDV Hitchner B1 (Accetion no.AF375823)	401	EGRILTVGTSHFLYQRGSSYFSPALLYPMTVSKDKTATLHSPYTFNAFTRPGSIPQASARCPNSCVTVGVYTDPPYPLIFYRNHRTLGRVFGTMLDGEQARLN	500	
NDV Beaudette C (Accetion no.AF309036)	401	EGRILTVGTSHFLYQRGSSYFSPALLYPMTVSKDKTATLHSPYTFNAFTRPGSIPQASARCPNSCVTVGVYTDPPYPLIFYRNHRTLGRVFGTMLDGEQARLN	500	
NDV Hitchner B1 (Accetion no.AF375823)	501	PASAVFDSTSRSRITRVSSSSIKAAAYTTSTCFKVVKTNKTYCLSI AEISNTLFGFEFRIVPLLV EILKDDGVREARSG	577	
NDV Beaudette C (Accetion no.AF309036)	501	PTSAVFDSTSRSRITRVSSSSIKAAAYTTSTCFKVVKTNKTYCLSI AEISNTLFGFEFRIVPLLV EILKDDGVREARSG	577	

APMV-2 F protein

In this study

APMV-2 (Accetion no.LC187305)	1	MNQALVILLVSFQLGVALDNSVLAPIGVASAQEWQLAAYTTTLTG	100
APMV-2 Yucaipa (Accetion no.EU338414)	1	MNQALVILLVSFQLGVALDNSVLAPIGVASAQEWQLAAYTTTLTG	100
APMV-2 (Accetion no.LC187305)	101	GAIIGSVALGVATAAQITA	200
APMV-2 Yucaipa (Accetion no.EU338414)	101	GAIIGSVALGVATAAQITA	200
APMV-2 (Accetion no.LC187305)	201	TVFGSQITNPALSTLSYQALYS	300
APMV-2 Yucaipa (Accetion no.EU338414)	201	TVFGSQITNPALSTLSYQALYS	300
APMV-2 (Accetion no.LC187305)	301	VPRYVAQSRVLTEELDVSTCRFSK	400
APMV-2 Yucaipa (Accetion no.EU338414)	301	VPRYVAQSRVLTEELDVSTCRFSK	400
APMV-2 (Accetion no.LC187305)	401	IDSSICKEVVLESVQLRLEGLKSSQYFSNVTIDLSQITTS	500
APMV-2 Yucaipa (Accetion no.EU338414)	401	IDSSICKEVVLESVQLRLEGLKSSQYFSNVTIDLSQITTS	500
APMV-2 (Accetion no.LC187305)	501	TVCFCYSA	536
APMV-2 Yucaipa (Accetion no.EU338414)	501	TVCFCYSA	536

Endodomain

Transmembrane

APMV-2 HN protein

In this study

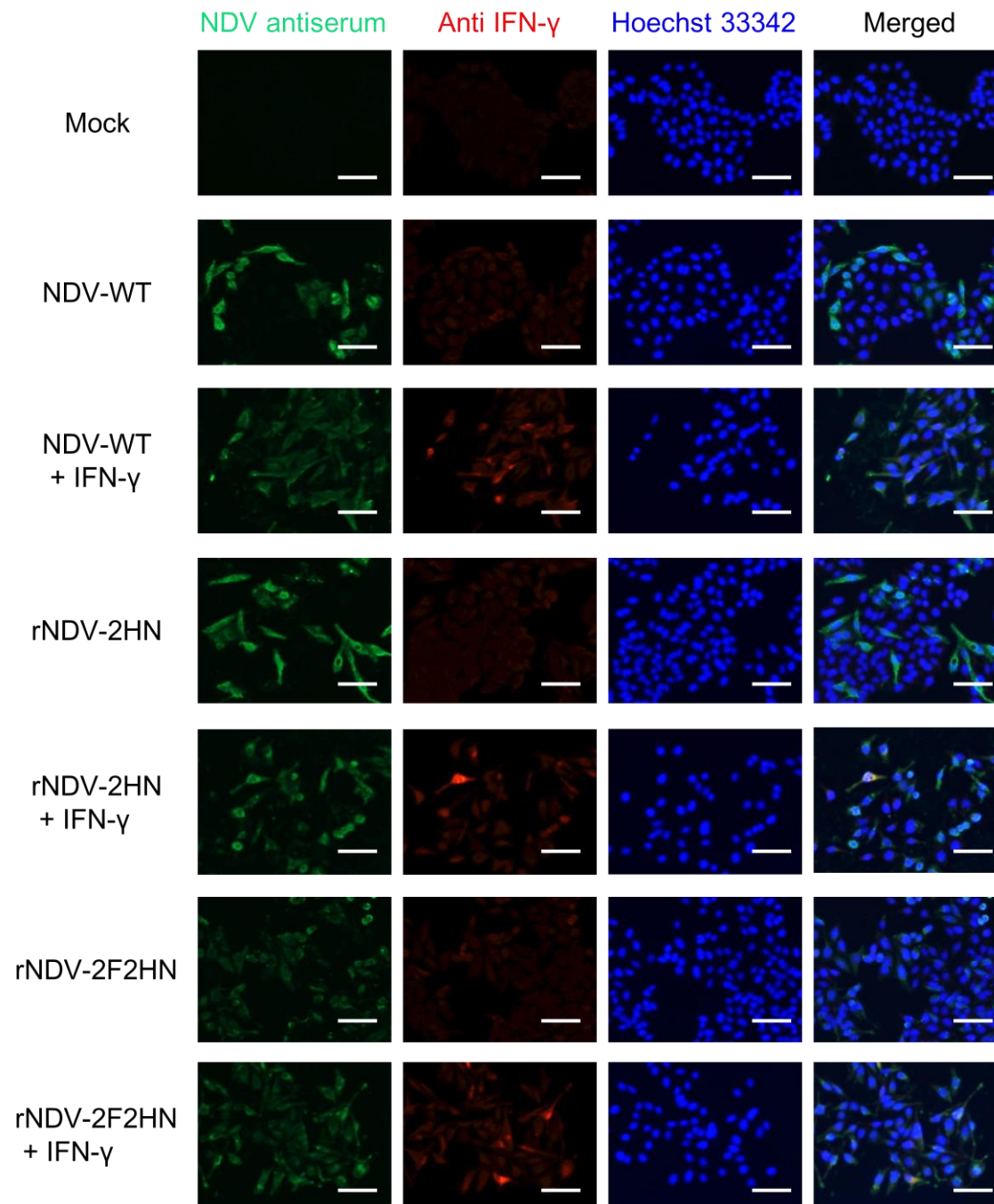
this study		Endodomain	Transmembrane																			
APMV-2 (Accetion no.LC187305)	1	MDFFPSRENLAAGDISGRKTWRLLFRIL	TLTSLIGVVC	LAINIAITIAKLDHLDNMASNTWTTTEADRVISSITTP	LKVPVNQINDMFRIVALDLPLQMTSLQK	100																
APMV-2 Yucaipa (Accetion no.EU338414)	1	MDFFPSRENLAAGDISGRKTWRLLFRIL	TLTSLIGVVC	LAINIAITIAKLDHLDNMASNTWTTTEADRVISSITTP	LKVPVNQINDMFRIVALDLPLQMTSLQK	100																
APMV-2 (Accetion no.LC187305)	101	ETASQVGF	LAESINNVL	SKNGSAGLV	LVDNPEYAGGIAV	SLYQGDASAGLN	FQPI	SLIEHPSFV	PGPTTAKGCIRI	PTFHMGP	SHWCYSHNIIASGCQDA	200										
APMV-2 Yucaipa (Accetion no.EU338414)	101	ETASQVGF	LAESINNVL	SKNGSAGLV	LVDNPEYAGGIAV	SLYQGDASAGLN	FQPI	SLIEHPSFV	PGPTTAKGCIRI	PTFHMGP	SHWCYSHNIIASGCQDA	200										
APMV-2 (Accetion no.LC187305)	201	SHSSMYIS	LGVLKASQ	TGSPIFLT	TASQLVDDN	INRKS	CS	IVASKYGC	DILCS	IVIETED	EDYRSDPAT	SMIIGRL	FFNGS	SYTESKINTG	SIFSLFS	FANY	300					
APMV-2 Yucaipa (Accetion no.EU338414)	201	SHSSMYIS	LGVLKASQ	TGSPIFLT	TASQLVDDN	INRKS	CS	IVASKYGC	DILCS	IVIETED	EDYRSDPAT	SMIIGRL	FFNGS	SYTESKINTG	SIFSLFS	FANY	300					
APMV-2 (Accetion no.LC187305)	301	PAVGS	GIVVGDEA	AFPIYGGV	KQNTWLF	NQLKDFGY	FT	HN	DVYKCN	RTD	IQQTIL	DAYRPPK	I	SGRLWVQ	GILLCP	VS	LRPDPG	CR	LKV	FNTSNV	MMGAE	400
APMV-2 Yucaipa (Accetion no.EU338414)	301	PAVGS	GIVVGDEA	AFPIYGGV	KQNTWLF	NQLKDFGY	FT	HN	DVYKCN	RTD	IQQTIL	DAYRPPK	I	SGRLWVQ	GILLCP	VS	LRPDPG	CR	LKV	FNTSNV	MMGAE	400
APMV-2 (Accetion no.LC187305)	401	ARLIQV	GSTVYLYQ	RSSSWV	VGLTYK	LDVSEIT	SQTGNT	LNHVD	PIAHTK	FRP	PSFER	DACAR	PNICPA	VCVSGV	YQDIW	PI	STATN	NSNIV	WVGQY	LE	500	
APMV-2 Yucaipa (Accetion no.EU338414)	401	ARLIQV	GSTVYLYQ	RSSSWV	VGLTYK	LDVSEIT	SQTGNT	LNHVD	PIAHTK	FRP	PSFER	DACAR	PNICPA	VCVSGV	YQDIW	PI	STATN	NSNIV	WVGQY	LE	500	
APMV-2 (Accetion no.LC187305)	501	AFYSRK	YPRIGI	ATQYEW	KVTNQL	FNSNTE	GGYSTT	TCFRN	TKRDK	KAYCV	VI	SEYADG	VFGS	YRIVP	QLIEIR	TTTG	KSE					580
APMV-2 Yucaipa (Accetion no.EU338414)	501	AFYSRK	YPRIGI	ATQYEW	KVTNQL	FNSNTE	GGYSTT	TCFRN	TKRDK	KAYCV	VI	SEYADG	VFGS	YRIVP	QLIEIR	TTTG	KSE					580



**Figure S2. Analysis of chimeric NDVs genome stability.**

(A) Summary of sequenced samples. (B) Comparison of gene sequences in each sample. (C) Comparison of gene sequences between the viruses used in each study.

# HEp-2 cells

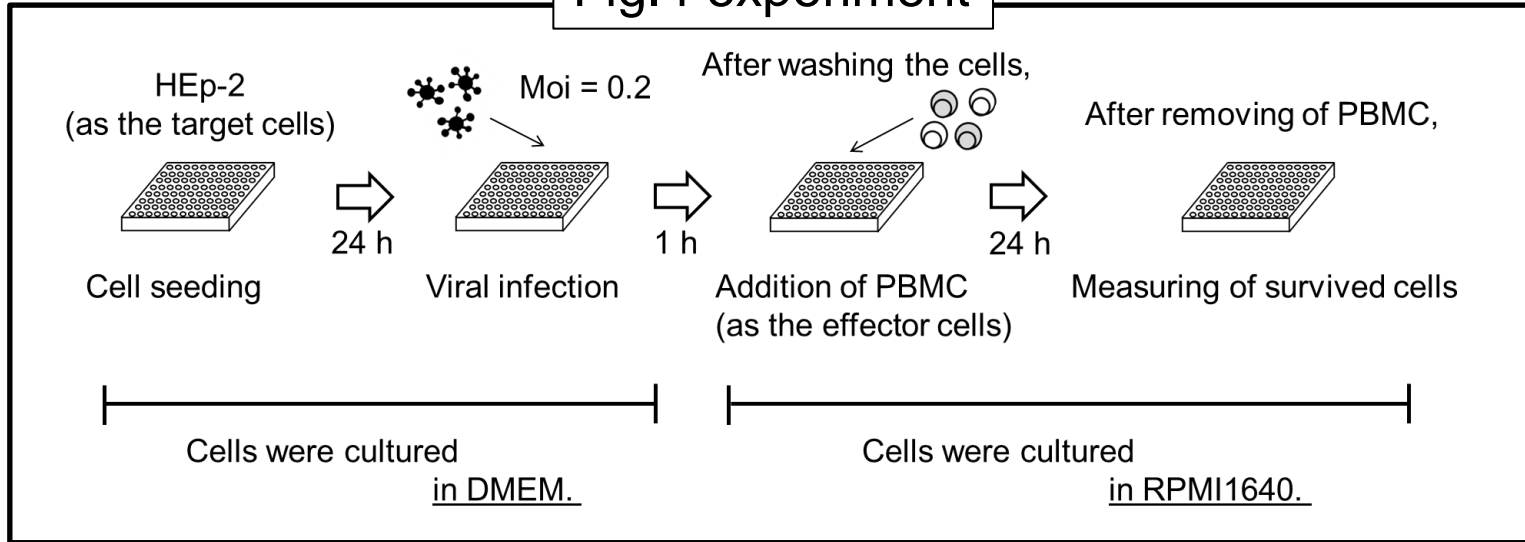


**Figure S3. INF- $\gamma$  expression was detected in infected cells with recombinant NDVs + IFN- $\gamma$ .**

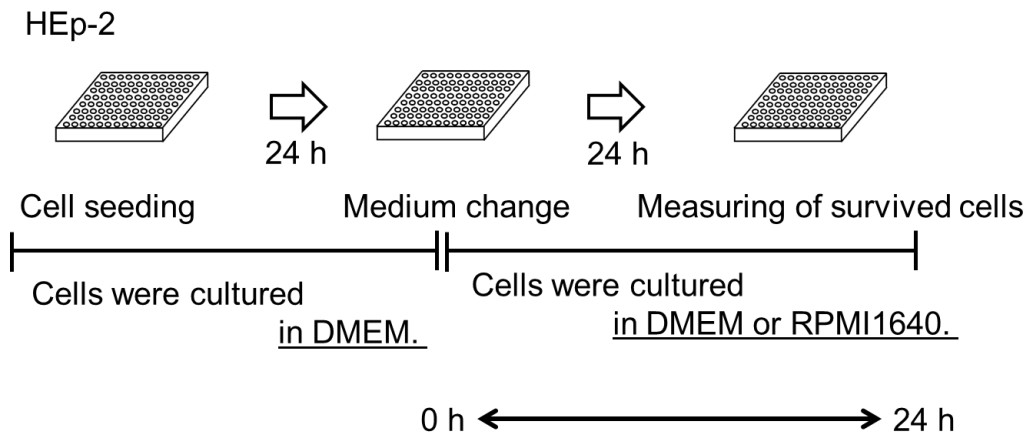
Cells infected with each virus at an MOI of 0.5 were stained using anti-NDV antiserum (green), INF- $\gamma$  antibody (red), and Hoechst 33342 (blue; nuclei). Scale bar: 50  $\mu$ m

A

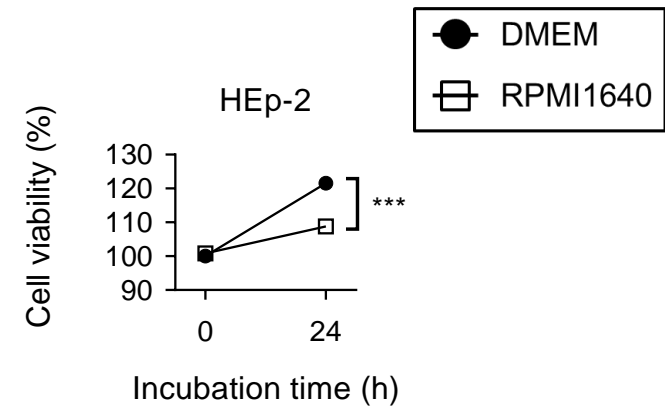
Fig.4 experiment



B



C



**Figure S4. HEp-2 cells proliferation was modified by RPMI1640 medium.**

(A) Schema of the killing assay in Fig. 4. After addition of PBMC, the culture medium was changed to RPMI1640 medium. (B) Schema of the cell viability assay under the killing assay conditions. (C) Cell viability was evaluated by MTT assay at 0 and 24 hours post medium change.

**Table S1. Primer sets used in this study.**

Primer set	Primer	Sequence
NDV F + NDV HN	Forward	5'-TGACCAGCACATCTGCTCTC-3'
	Reverse	5'-AGCCAAGGTCAC TACTGT TA-3'
NDV F + APMV2 HN	Forward	5'-TGACCAGCACATCTGCTCTC-3'
	Reverse	5'-TGATGTCATCTGCAGAGGTA-3'
APMV2 F + APMV2 HN	Forward	5'-ACGACATTGGCTCCGTAACA-3'
	Reverse	5'-TGATGTCATCTGCAGAGGTA-3'
NDV 6001 + NDV 6180	Forward	5'-GAAAATCAAGCGCCTTGC-3'
	Reverse	5'-TCCTTAATGTAGCTAG-3'