

# PA (2233 bp)

Nature: cRNA

Source: DQ487327.1 Influenza A virus (A/Moscow/10/99(H3N2)) segment 3

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AGCGAAAGCAGGTACTGATTTCGAAATGGAAGATTTTGTGCGACAATGCTTCAACCCGATGATTGTGGAAC
TTGCAGAAAAAGCAATGAAAGAGTATGGAGAGGATCTGAAAATTGAAACAAACAAATTTGCAGCAATATG
CACTCACTTGGAGGTATGTTTCATGTATTTCAGATTTTCATTTTCATCAATGAACAAGGCGAATCAATAGTG
GTAGAACTTGATGATCCAAATGCACTGTTAAAGCACAGATTTGAAATAATCGAGGGGAGAGACAGAACAA
TGGCCTGGACAGTAGTAAACAGTATCTGCAACACTACTGGAGCTGAAAAACCGAAGTTTCTACCAGATTT
GTATGATTACAAGGAGAACAGATTCATCGAAATTGGAGTGACAAGGAGAGAAGTCCACATATATTACCTT
GAAAAGGCCAATAAAATTAAATCTGAGAATACACACATTCACATTTTCTCATTCACTGGGGAGGAAATGG
CCACAAAGGCAGACTACACTCTCGACGAGGAAAGCAGGGCTAGGATTAAGACCAGGCTATTTACCATAAG
ACAAGAAATGGCCAACAGAGGCCTCTGGGATTCTTTTCGTCACTCCGAAAGAGGCGAAGAAACAATTGAA
GAAAAATTTGAAATCTCAGGAATATGCGCAGGCTTGCCGACCAAAGTCTCCCGCCGAACCTTCTCCTGCC
TTGAGAATTTTAGAGCCTATGTGGATGGATTTCGAACCGAACGGCTGCATTGAGGGCAAGCTTTCTCAAAT
GTCCAAAGAAGTGAATGCCAAAATTGAACCTTTTTCTGAAGACAACACCAAGACCAATCAAACCTTCCGAAT
GGACCTCCTTGTTATCAGCGGTCCAAATTCCTCCTGATGGATGCTTTAAAAATTGAGCATTGAAGACCCAA
GTCACGAAGGAGAAGGGATCCCCTATATGATGCGATCAAGTGCATAAAAAACATTTCTTTGGATGGAAAGA
ACCTTATATAGTCAAACACACGAAAAGGGAATAAAATTCAAATTACCTGCTGTCAATGGAAAGCAAGTATTG
TCAGAATTGCAGGACATTGAAAATGAGGAGAAGATTCCAAGGACTAAAAACATGAAGAAAACGAGTCAAC
TAAAGTGGGCTCTTGGTGAAAACATGGCACCAGAGAAAGTAGACTTTGACAACTGCAGAGACATAAGCGA
TTTGAAGCAATATGATAGTGACGAACCTGAATTAAGGTCACCTTCAAGCTGGATACAGAATGAGTTCAAC
AAGGCTGCGAGCTAACTGATTCAATCTGGATAGAGCTCGATGAAATTGGAGAGGACGTAGCCCCAATTG
AGTACATTGCAAGCATGAGGAGGAATTATTTACAGCAGAGGTGTCCCATTTGTAGAGCCACTGAATACAT
AATGAAGGGGGTATACATTAATACTGCCTTGCTCAATGCATCCTGTGCAGCAATGGACGATTTTCAACTA
ATTCCCATGATAAGCAAGTGCAGAACTAAAAGAGGGGAAGGCGAAAAACCAATTTATATGGATTTCATATAA
AAGGAAGATCTCATTAAAGGAATGACACAGATGTGGTAAACTTTGTGAGCATGGAGTTTTCTCTCACTGA
CCCGAGACTTGAGCCACATAAATGGGAGAAATACTGTGTCTTGAGATAGGAGATATGTTACTAAGAAGT
GCCATAGGCCAAATTTCAAGGCCTATGTTCTTGATGTGAGGACAAACGGAACATCAAAGGTCAAATGA
AATGGGGAATGGAGATGAGACGTTGCCTCCTTCAGTCACTCCAGCAGATCGAGAGCATGATTGAAGCCGA
GTCCTCGGTTAAAGAGAAAGACATGACCAAAGAGTTTTTTGAGAATAAATCAGAAGCATGGCCCATTTGGG
GAGTCCCCCAAGGGAGTGGAAGAAGGTTCCATTGGGAAAGTCTGTAGGACTCTGTTGGCTAAGTCGGTGT
TCAATAGCCTGTATGCATCACCACAATTAGAAGGATTTTCAGCGGAGTCAAGAAAACCTGCTCCTTGTTGT
TCAGGCTCTTAGGGACAACCTCGAACCTGGGACCTTTGATCTTGGGGGGCTATATGAAGCAATTGAGGAG
TGCCTGATTAATGATCCCTGGGTTTTGCTCAATGCGTCTTGGTTCAACTCCTTCCTGACACATGCATTAA
AATAGTTATGGCAGTGCTACTATTTGTTATCCGTACTGTCCAAAAAAGTACCTTGTTTCTACT
```

# PA protein

Source: ABE73095.1 (716 aa) polymerase PB2

Sequence: 251- 715

MEDFVRQCFNPMIVELAEKAMKEYGEDLKIETNKFAAICTHLEVCFMYSDFHFINEQGESIVVELDDPNA  
LLKHRFEIIIEGRDRTMAWTVVNSICNTTGAEKPKFLPDLYDYKENRFIEIGVTRREVHIYYLEKANKIKS  
ENTHIHIFSFTGEEMATKADYTLDEESRARIKTRLFTIRQEMANRGLWDSFRQSERGEETIEEKFEISGT  
MRRLADQSLPPNFSCLENFRAYVDGFEPNGCIEGKLSQMSKEVNAKIEPFLKTTPRPIKLPNGPPCYQRS  
KFLMLDALKLSIEDPSHEGEGIPLYDAIKCIKTFFGWKEPYIVKPHEKGINSNYLLSWKQVLSELQDIEN  
EEKIPRTKNMKKTSQKWKALGENMAPEKVDFDNCRDISDLKQYDSDEPELRSLSWIQNEFNKACELTDS  
IWIELDEIGEDVAPIEYIASMRNYFTAEVSHCRATEYIMKGVYINTALLNASCAAMDDFQLIPMISKCR  
TKEGRRKTNLYGFIIKGRSHLRNDTDVVNFVSMEFSLTDPRLPHKWEKYCVLEIGDMLLRSAIGQISRP  
MFLYVRTNGTSKVKMKWGMEMRRCLLQSLQQIESMIEAESSVKEKDMTKEFFENKSEAWPIGESPKGVVEE  
GSIGKVCRTLLAKSVFNSLYASPLQLEGFSAESRKLLLVVQALRDNLEPGTFDLGGLYEAIEECLINDPWV  
LLNASWFNSFLTHALK

# PA (2233 bp)

Nature: vRNA

Source: Illumina sequences from virus stocks\_RPS2022

NNNNNNAGCAGGTACTGATTTCGAAATGGAAGATTTTGTGCGACAATGCTTCAACCCGATGAT  
TGTCGAACTTGCAGAAAAAGCAATGAAAGAGTATGGAGAGGATCTGAAAATTGAAACAAACA  
AATTTGCAGCAATATGCACTCACTTGGAGGTATGTTTCATGTATTTCAGATTTTCATTTTCATC  
AATGAACAAGGCGAATCAATAGTGGTAGAACTTGATGATCCAAATGCACTGTTAAAGCACAG  
ATTTGAAATAATCGAGGGGAGAGACAGAACAAATGGCCTGGACAGTAGTAAACAGTATCTGCA  
ACACTACTGGAGCTGAAAAACCGAAGTTTCTACCAGATTTGTATGATTACAAGGAGAACAGA  
TTCATCGAAATTGGAGTGACAAGGAGAGAAGTCCACATATATTACCTTGAAAAGGCCAATAA  
AATTAAATCTGAGAATACACACATTCACATTTTCTCATTCACTGGGGAGGAAATGGCCACAA  
AGGCAGACTACACTCTCGACGAGGAAAGCAGGGCTAGGATTAAGACCAGGCTATTTACCATA  
AGACAAGAAATGGCCAACAGAGGCCTCTGGGATTCCTTTCGTCAGTCCGAAAGAGGCGAAGA  
AACAAATTGAAGAAAAATTTGAAATCTCAGGAAGTATGCGCAGGCTTGCCGACCAAAGTCTCC  
CGCCGAACCTTCTCCTGCCTTGAGAATTTTAGAGCCTATGTGGATGGATTGCAACCGAACGGC  
TGCATTGAGGGCAAGCTTTCTCAAATGTCCAAAGAAGTGAATGCCAAAATTGAACCTTTTCT  
GAAGACAACACCAAGACCAATCAAACCTTCCGAATGGACCTCCTTGTTATCAGCGGTCCAAAT  
TCCTCCTGATGGATGCTTTAAAATTGAGCATTGAAGACCCAAGTCACGAAGGAGAAGGGATC  
CCACTATATGATGCGATCAAGTGCATAAAAACATTCTTTGGATGGAAAGAACCTTATATAGT  
CAAACCACACGAAAAGGGAATAAATTCAAATTACCTGCTGTCATGGAAGCAAGTATTGTCAG  
AATTGCAGGACATTGAAAATGAGGAGAAGATTCCAAGGACTAAAAACATGAAGAAAACGAGT  
CAACTAAAGTGGGCTCTTGGTGAAAACATGGCACCAGAGAAAGTAGACTTTGACAAGTGCAG  
AGACATAAGCGATTTGAAGCAATATGATAGTGACGAACCTGAATTAAGGTCACTTTCAGCT  
GGATACAGAATGAGTTCAACAAGGCCTGCGAGCTAACTGATTCAATCTGGATAGAGCTCGAT  
GAAATTGGAGAGGACGTAGCCCCAATTGAGTACATTGCAAGCATGAGGAGGAATTATTTTCAC  
AGCAGAGGTGTCCCATTTGTAGAGCCACTGAGTACATAATGAAGGGGTATACATTAATACTG  
CCTTGCTCAATGCATCCTGTGCAGCAATGGACGATTTTCAACTAATTCCCATGATAAGCAAG  
TGCAGAACTAAAGAGGGAAGGCGAAAAACCAATTTATATGGATTTCATCATAAAAGGAAGATC  
TCATTTAAGGAATGACACAGATGTGGTAACTTTGTGAGCATGGAGTTTTTCTCTCACTGACC  
CGAGACTTGAGCCACATAAATGGGAGAAATACTGTGTCCTTGAGATAGGAGATATGTTACTA  
AGAAGTGCCATAGGCCAAATTTCAAGGCCTATGTTCTTGTATGTGAGGACAAACGGAACATC  
AAAGGTCAAAATGAAATGGGGAATGGAGATGAGACGTTGCCTCCTTCAGTCACTCCAGCAGA  
TCGAGAGCATGATTGAAGCCGAGTCCTCGGTTAAAGAGAAAGACATGACCAAAGAGTTTTTT  
GAGAATAAATCAGAAGCATGGCCCATTTGGGGAGTCCCCCAAGGGAGTGGAAGAAGGTTCCAT  
TGGGAAAGTCTGTAGGACTCTGTTGGCTAAGTCGGTGTTCATAGCCTGTATGCATCACCAC  
AATTAGAAGGATTTTTCAGCGGAGTCAAGAAAAGTCTCCTTGTTGTTTCAGGCTCTTAGGGAC  
AACCTCGAACCTGGGACCTTTGATCTTGGGGGGCTATATGAAGCAATTGAGGAGTGCCTGAT  
TAATGATCCCTGGGTTTTGCTCAATGCGTCTTGGTTCAACTCCTTCCTGACACATGCATTAA  
AATAGTTATGGCAGTGCTACTATTTGTTATCCGTACTGTCCAAAAAAGTACCTTGNNNNNNN  
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# PA (2233 bp)

Nature: cDNA\_pHW2000

Source: GATC sequences from Maxiprep\_RPS\_2023

AGCAAAAGCAGGTACTGATTTCGAA**ATG**GAAAGATTTTGTGCGACAATGCTTCAACCCGATGAT  
TGTCGAACTTGCAGAAAAAGCAATGAAAGAGTATGGAGAGGATCTGAAAATTGAAACAAACA  
AATTTGCAGCAATATGCACTCACTTGGAGGTATGTTTCATGTATTTCAGATTTTCATTTTCATC  
AATGAACAAGGCGAATCAATAGTGGTAGAACTTGATGATCCAAATGCACTGTTAAAGCACAG  
ATTTGAAATAATCGAGGGGAGAGACAGAACAATGGCCTGGACAGTAGTAAACAGTATCTGCA  
ACACTACTGGAGCTGAAAAACCGAAGTTTCTACCAGATTTGTATGATTACAAGGAGAACAGA  
TTCATCGAAATTGGAGTGACAAGGAGAGAAGTCCACATATATTACCTTGAAAAGGCCAATAA  
AATTAAATCTGAGAATACACACATTCACATTTTCTCATTCACTGGGGAGGAAATGGCCACAA  
AGGCAGACTACACTCTCGACGAGGAAAGCAGGGCTAGGATTAAGACCAGGCTATTTACCATA  
AGACAAGAAATGGCCAACAGAGGCCTCTGGGATTCCTTTCGTCAGTCCGAAAGAGGCGAAGA  
AACAATTGAAGAAAAATTTGAAATCTCAGGAACTATGCGCAGGCTTGCCGACCAAAGTCTCC  
CGCCGAACCTTCTCCTGCCTTGAGAATTTTAGAGCCTATGTGGATGGATTTCGAACCGAACGGC  
TGCATTGAGGGCAAGCTTTCTCAAATGTCCAAAGAAGTGAATGCCAAAATTGAACCTTTTCT  
GAAGACAACACCAAGACCAATCAAACCTTCCGAATGGACCTCCTTGTTATCAGCGGTCCAAAT  
TCCTCCTGATGGATGCTTTAAAATTGAGCATTGAAGACCCAAGTCACGAAGGAGAAGGGATC  
CCACTATATGATGCGATCAAGTGCATAAAAACATTCTTTGGATGGAAAGAACCTTATATAGT  
CAAACCACACGAAAAGGGAATAAATTCAAATTACCTGCTGTCATGGAAGCAAGTATTGTCAG  
AATTGCAGGACATTGAAAATGAGGAGAAGATTCCAAGGACTAAAAACATGAAGAAAACGAGT  
CAACTAAAGTGGGCTCTTGGTGAAAACATGGCACCAGAGAAAGTAGACTTTGACAACCTGCAG  
AGACATAAGCGATTTGAAGCAATATGATAGTGACGAACCTGAATTAAGGTCACTTTCAGCT  
GGATACAGAATGAGTTCAACAAGGCCTGCGAGCTAACTGATTCAATCTGGATAGAGCTCGAT  
GAAATTGGAGAGGACGTAGCCCCAATTGAGTACATTGCAAGCATGAGGAGGAATTATTTTCAC  
AGCAGAGGTGTCCCATTTGTAGAGCCACTGAGTACATAATGAAGGGGGTATACATTAATACTG  
CCTTGCTCAATGCATCCTGTGCAGCAATGGACGATTTTCAACTAATTCCCATGATAAGCAAG  
TGCAGAACTAAAGAGGGAAGGCGAAAAACCAATTTATATGGATTTCATCATAAAAGGAAGATC  
TCATTTAAGGAATGACACAGATGTGGTAAACTTTGTGAGCATGGAGTTTTCTCTCACTGACC  
CGAGACTTGAGCCACATAAATGGGAGAAATACTGTGTCCTTGAGATAGGAGATATGTTACTA  
AGAAGTGCCATAGGCCAAATTTCAAGGCCTATGTTCTTGTATGTGAGGACAAACGGAACATC  
AAAGGTCAAAATGAAATGGGGAATGGAGATGAGACGTTGCCTCCTTCAGTCACTCCAGCAGA  
TCGAGAGCATGATTGAAGCCGAGTCCTCGGTTAAAGAGAAAGACATGACCAAAGAGTTTTTTT  
GAGAATAAATCAGAAGCATGGCCCATTTGGGGAGTCCCCCAAGGGAGTGGAAGAAGGTTCCAT  
TGGGAAAGTCTGTAGGACTCTGTTGGCTAAGTCGGTGTTCAATAGCCTGTATGCATCACCAC  
AATTAGAAGGATTTTTCAGCGGAGTCAAGAAAACCTGCTCCTTGTTGTTTCAGGCTCTTAGGGAC  
AACCTCGAACCTGGGACCTTTGATCTTGGGGGGCTATATGAAGCAATTGAGGAGTGCCTGAT  
TAATGATCCCTGGGTTTTGCTCAATGCGTCTTGGTTCAACTCCTTCCTGACACATGCATTAA  
AA**TAG**TTATGGCAGTGCTACTATTTGTTATCCGTACTGTCCAAAAAAGTACCTTGTTTCTAC  
T

LUSTAL 0(1.2.4) multiple sequence alignment		
MO_PA_Virus	NNNNNNAGCAGGTACTGATTTCGAAATGGAAGATTTTGTGCGACAATGCTTCAACCCGATG	60
MO_PA_NCB1	AGCGAAAGCAGGTACTGATTTCGAAATGGAAGATTTTGTGCGCAATGCTTCAACCCGATG	60
MO_PA_pHW2000	AGCAAAAGCAGGTACTGATTTCGAAATGGAAGATTTTGTGCGACAATGCTTCAACCCGATG	60
*****		
MO_PA_Virus	ATTGTCGAAC TTGCAGAAAAAGCAATGAAAGAGTATGGAGAGGATCTGAAAAATTGAAACA	120
MO_PA_NCB1	ATTGTCGAAC TTGCAGAAAAAGCAATGAAAGAGTATGGAGAGGATCTGAAAAATTGAAACA	120
MO_PA_pHW2000	ATTGTCGAAC TTGCAGAAAAAGCAATGAAAGAGTATGGAGAGGATCTGAAAAATTGAAACA	120
*****		
MO_PA_Virus	AACAAATTTGCAGCAATATGCAC TCACTTGGAGGTATGTTTCATGTATTCAGATTTTTCAT	180
MO_PA_NCB1	AACAAATTTGCAGCAATATGCAC TCACTTGGAGGTATGTTTCATGTATTCAGATTTTTCAT	180
MO_PA_pHW2000	AACAAATTTGCAGCAATATGCAC TCACTTGGAGGTATGTTTCATGTATTCAGATTTTTCAT	180
*****		
MO_PA_Virus	TTCAATCAATGAACAAGGCGAATCAATAGTGGTAGAACTTGATGATCCAAATGCAC TGTTA	240
MO_PA_NCB1	TTCAATCAATGAACAAGGCGAATCAATAGTGGTAGAACTTGATGATCCAAATGCAC TGTTA	240
MO_PA_pHW2000	TTCAATCAATGAACAAGGCGAATCAATAGTGGTAGAACTTGATGATCCAAATGCAC TGTTA	240
*****		
MO_PA_Virus	AAGCACAGATTTGAAATAATCGAGGGGAGAGACAGAACAAATGGCCTGGACAGTAGTAAAC	300
MO_PA_NCB1	AAGCACAGATTTGAAATAATCGAGGGGAGAGACAGAACAAATGGCCTGGACAGTAGTAAAC	300
MO_PA_pHW2000	AAGCACAGATTTGAAATAATCGAGGGGAGAGACAGAACAAATGGCCTGGACAGTAGTAAAC	300
*****		
MO_PA_Virus	AGTATCTGCAACACTACTGGAGCTGAAAAACCGAAGTTTCTACCAGATTTGTATGATTAC	360
MO_PA_NCB1	AGTATCTGCAACACTACTGGAGCTGAAAAACCGAAGTTTCTACCAGATTTGTATGATTAC	360
MO_PA_pHW2000	AGTATCTGCAACACTACTGGAGCTGAAAAACCGAAGTTTCTACCAGATTTGTATGATTAC	360
*****		
MO_PA_Virus	AAGGAGAACAGATTCATCGAAATTTGGAGTGACAAGGAGAGAAGTCCACATATATTACCTT	420
MO_PA_NCB1	AAGGAGAACAGATTCATCGAAATTTGGAGTGACAAGGAGAGAAGTCCACATATATTACCTT	420
MO_PA_pHW2000	AAGGAGAACAGATTCATCGAAATTTGGAGTGACAAGGAGAGAAGTCCACATATATTACCTT	420
*****		
MO_PA_Virus	GAAAAGGCCAATAAAATTAAATCTGAGAATACACACATTCACATTTTCTCAITTCACTGGG	480
MO_PA_NCB1	GAAAAGGCCAATAAAATTAAATCTGAGAATACACACATTCACATTTTCTCAITTCACTGGG	480
MO_PA_pHW2000	GAAAAGGCCAATAAAATTAAATCTGAGAATACACACATTCACATTTTCTCAITTCACTGGG	480
*****		
MO_PA_Virus	GAGGAAATGGCCACAAGGCAGACTACACTCTCGACGAGGAAAGCAGGCTAGGATTAAAG	540
MO_PA_NCB1	GAGGAAATGGCCACAAGGCAGACTACACTCTCGACGAGGAAAGCAGGCTAGGATTAAAG	540
MO_PA_pHW2000	GAGGAAATGGCCACAAGGCAGACTACACTCTCGACGAGGAAAGCAGGCTAGGATTAAAG	540
*****		
MO_PA_Virus	ACCAGGCTATTTACCATAAGACAAGAAATGGCCAACAGAGGCCTCTGGGATTCCCTTCGT	600
MO_PA_NCB1	ACCAGGCTATTTACCATAAGACAAGAAATGGCCAACAGAGGCCTCTGGGATTCCCTTCGT	600
MO_PA_pHW2000	ACCAGGCTATTTACCATAAGACAAGAAATGGCCAACAGAGGCCTCTGGGATTCCCTTCGT	600
*****		
MO_PA_Virus	CAGTCCGAAAGAGGCGAAGAAACAATTGAAGAAAAAATTTGAAATCTCAGGAAC TATGCGC	660
MO_PA_NCB1	CAGTCCGAAAGAGGCGAAGAAACAATTGAAGAAAAAATTTGAAATCTCAGGAAC TATGCGC	660
MO_PA_pHW2000	CAGTCCGAAAGAGGCGAAGAAACAATTGAAGAAAAAATTTGAAATCTCAGGAAC TATGCGC	660
*****		
MO_PA_Virus	AGGCTTGCCGACCAAAGTCTCCGCGCGAACTTCTCTGCCTTGAGAATTTTATAGAGCCTAT	720
MO_PA_NCB1	AGGCTTGCCGACCAAAGTCTCCGCGCGAACTTCTCTGCCTTGAGAATTTTATAGAGCCTAT	720
MO_PA_pHW2000	AGGCTTGCCGACCAAAGTCTCCGCGCGAACTTCTCTGCCTTGAGAATTTTATAGAGCCTAT	720
*****		
MO_PA_Virus	GTGGATGGATTCGAACCGAACGGCTGCA TTGAGGGCAAGCTTTCTCAAATGTCCAAAGAA	780
MO_PA_NCB1	GTGGATGGATTCGAACCGAACGGCTGCA TTGAGGGCAAGCTTTCTCAAATGTCCAAAGAA	780
MO_PA_pHW2000	GTGGATGGATTCGAACCGAACGGCTGCA TTGAGGGCAAGCTTTCTCAAATGTCCAAAGAA	780
*****		
MO_PA_Virus	GTGAATGCCAAAATTGAACCTTTTCTGAAGACAACACCAAGACCAATCAAAC TCCGAAT	840
MO_PA_NCB1	GTGAATGCCAAAATTGAACCTTTTCTGAAGACAACACCAAGACCAATCAAAC TCCGAAT	840
MO_PA_pHW2000	GTGAATGCCAAAATTGAACCTTTTCTGAAGACAACACCAAGACCAATCAAAC TCCGAAT	840
*****		
MO_PA_Virus	GGACCTCCTTGT TATCAGCGGTCCAAATTCCTCCTGATGGATGCTTTAAAA TTGAGCATT	900
MO_PA_NCB1	GGACCTCCTTGT TATCAGCGGTCCAAATTCCTCCTGATGGATGCTTTAAAA TTGAGCATT	900
MO_PA_pHW2000	GGACCTCCTTGT TATCAGCGGTCCAAATTCCTCCTGATGGATGCTTTAAAA TTGAGCATT	900
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MO_PA_Virus	GAAGACCCAAGTCACGAAGGAGAAGGGATCCCAC TATATGATGCGATCAAGTGCATAAAA	960
MO_PA_NCB1	GAAGACCCAAGTCACGAAGGAGAAGGGATCCCAC TATATGATGCGATCAAGTGCATAAAA	960
MO_PA_pHW2000	GAAGACCCAAGTCACGAAGGAGAAGGGATCCCAC TATATGATGCGATCAAGTGCATAAAA	960
*****		
MO_PA_Virus	ACATTCTTTGGATGGAAGAACCTTATATAGTCAAACCACACGAAAAGGGAATAAA TTCA	1020
MO_PA_NCB1	ACATTCTTTGGATGGAAGAACCTTATATAGTCAAACCACACGAAAAGGGAATAAA TTCA	1020
MO_PA_pHW2000	ACATTCTTTGGATGGAAGAACCTTATATAGTCAAACCACACGAAAAGGGAATAAA TTCA	1020
*****		
MO_PA_Virus	AATTACCTGCTGT CATGGAAAGCAAGTATTGTCAGAATTGCAGGACATTGAAAA TGAGGAG	1080
MO_PA_NCB1	AATTACCTGCTGT CATGGAAAGCAAGTATTGTCAGAATTGCAGGACATTGAAAA TGAGGAG	1080
MO_PA_pHW2000	AATTACCTGCTGT CATGGAAAGCAAGTATTGTCAGAATTGCAGGACATTGAAAA TGAGGAG	1080
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MO_PA_Virus	AAGATTCCAAGGACTAAAAACATGAAGAAAACGAGTCAACTAAAGTGGGCTCTTGSTGAA	1140
MO_PA_NCB1	AAGATTCCAAGGACTAAAAACATGAAGAAAACGAGTCAACTAAAGTGGGCTCTTGSTGAA	1140
MO_PA_pHW2000	AAGATTCCAAGGACTAAAAACATGAAGAAAACGAGTCAACTAAAGTGGGCTCTTGSTGAA	1140
*****		
MO_PA_Virus	AACATGGCACCAAGAGAAAGTAGACTTTGACAAC TGCAGAGACATAAGCGATTGGAAGCAA	1200
MO_PA_NCB1	AACATGGCACCAAGAGAAAGTAGACTTTGACAAC TGCAGAGACATAAGCGATTGGAAGCAA	1200
MO_PA_pHW2000	AACATGGCACCAAGAGAAAGTAGACTTTGACAAC TGCAGAGACATAAGCGATTGGAAGCAA	1200
*****		
MO_PA_Virus	TATGATAGTGACGAACCTGAATTAAGGTCAC TTCAAGCTGGATACAGAATGAGTTCAAC	1260
MO_PA_NCB1	TATGATAGTGACGAACCTGAATTAAGGTCAC TTCAAGCTGGATACAGAATGAGTTCAAC	1260
MO_PA_pHW2000	TATGATAGTGACGAACCTGAATTAAGGTCAC TTCAAGCTGGATACAGAATGAGTTCAAC	1260
*****		
MO_PA_Virus	AAGGCCTGCGAGCTAACTGATTCAATCTGGATAGAGCTCGATGAAATTTGGAGAGGACGTA	1320
MO_PA_NCB1	AAGGCCTGCGAGCTAACTGATTCAATCTGGATAGAGCTCGATGAAATTTGGAGAGGACGTA	1320
MO_PA_pHW2000	AAGGCCTGCGAGCTAACTGATTCAATCTGGATAGAGCTCGATGAAATTTGGAGAGGACGTA	1320
*****		
MO_PA_Virus	GCCCCAATTGAGTACATTGCAAGCATGAGGAGGAATTATTTCA CAGCAGAGGTGTCCCAT	1380
MO_PA_NCB1	GCCCCAATTGAGTACATTGCAAGCATGAGGAGGAATTATTTCA CAGCAGAGGTGTCCCAT	1380
MO_PA_pHW2000	GCCCCAATTGAGTACATTGCAAGCATGAGGAGGAATTATTTCA CAGCAGAGGTGTCCCAT	1380
*****		
MO_PA_Virus	TGTAGAGCCACTGA GTACATAATGAAGGGGGTATACATTAA TACTGCCTTGCTCAATGCA	1440
MO_PA_NCB1	TGTAGAGCCACTGA GTACATAATGAAGGGGGTATACATTAA TACTGCCTTGCTCAATGCA	1440
MO_PA_pHW2000	TGTAGAGCCACTGA GTACATAATGAAGGGGGTATACATTAA TACTGCCTTGCTCAATGCA	1440
*****		
MO_PA_Virus	TCCTGTGCAGCAATGGACGATTTTCAACTAA TTCCCATGATAAGCAAGTGCAGAACTAAA	1500
MO_PA_NCB1	TCCTGTGCAGCAATGGACGATTTTCAACTAA TTCCCATGATAAGCAAGTGCAGAACTAAA	1500
MO_PA_pHW2000	TCCTGTGCAGCAATGGACGATTTTCAACTAA TTCCCATGATAAGCAAGTGCAGAACTAAA	1500
*****		
MO_PA_Virus	GAGGGAAGGCGAAAAACCAATTTATATGGATT CATATAAAAGGAAGATCTCATTTAAGG	1560
MO_PA_NCB1	GAGGGAAGGCGAAAAACCAATTTATATGGATT CATATAAAAGGAAGATCTCATTTAAGG	1560
MO_PA_pHW2000	GAGGGAAGGCGAAAAACCAATTTATATGGATT CATATAAAAGGAAGATCTCATTTAAGG	1560
*****		
MO_PA_Virus	AATGACACAGATGTGGTAAACTTTGTGAGCATGGAGTTTCTCTCACTGACCCGAGACTT	1620
MO_PA_NCB1	AATGACACAGATGTGGTAAACTTTGTGAGCATGGAGTTTCTCTCACTGACCCGAGACTT	1620
MO_PA_pHW2000	AATGACACAGATGTGGTAAACTTTGTGAGCATGGAGTTTCTCTCACTGACCCGAGACTT	1620
*****		
MO_PA_Virus	GAGCCACATAAATGGGAGAAATACTGTGTCCTTGAGATAGGAGATATGTTACTAAGAA GT	1680
MO_PA_NCB1	GAGCCACATAAATGGGAGAAATACTGTGTCCTTGAGATAGGAGATATGTTACTAAGAA GT	1680
MO_PA_pHW2000	GAGCCACATAAATGGGAGAAATACTGTGTCCTTGAGATAGGAGATATGTTACTAAGAA GT	1680
*****		
MO_PA_Virus	GCCATAGGCCAAATTTCAAGGCCTATGTTCTTGTATGTGAGGACAAACGGAACATCAAAG	1740
MO_PA_NCB1	GCCATAGGCCAAATTTCAAGGCCTATGTTCTTGTATGTGAGGACAAACGGAACATCAAAG	1740
MO_PA_pHW2000	GCCATAGGCCAAATTTCAAGGCCTATGTTCTTGTATGTGAGGACAAACGGAACATCAAAG	1740
*****		
MO_PA_Virus	GTCAAAATGAAATGGGGAATGGAGATGAGACGTTGCCTCCTTCAGTCACTCCAGCAGATC	1800
MO_PA_NCB1	GTCAAAATGAAATGGGGAATGGAGATGAGACGTTGCCTCCTTCAGTCACTCCAGCAGATC	1800
MO_PA_pHW2000	GTCAAAATGAAATGGGGAATGGAGATGAGACGTTGCCTCCTTCAGTCACTCCAGCAGATC	1800
*****		
MO_PA_Virus	GAGAGCATGATTGAAGCCGAGTCTTCGGTTAAAGAGAAAAGACATGACCAAAGAGTTTTTT	1860
MO_PA_NCB1	GAGAGCATGATTGAAGCCGAGTCTTCGGTTAAAGAGAAAAGACATGACCAAAGAGTTTTTT	1860
MO_PA_pHW2000	GAGAGCATGATTGAAGCCGAGTCTTCGGTTAAAGAGAAAAGACATGACCAAAGAGTTTTTT	1860
*****		
MO_PA_Virus	GAGAATAAATCAGAAGCATGGCCCA TTGGGGAGTCCCCCAAGGAGTGGAAAGAGGTTTCC	1920
MO_PA_NCB1	GAGAATAAATCAGAAGCATGGCCCA TTGGGGAGTCCCCCAAGGAGTGGAAAGAGGTTTCC	1920
MO_PA_pHW2000	GAGAATAAATCAGAAGCATGGCCCA TTGGGGAGTCCCCCAAGGAGTGGAAAGAGGTTTCC	1920
*****		
MO_PA_Virus	ATTGGGAAAGTCTGTAGGACTCTGTGTGGCTAAGTCGGTGTTC AATAGCCTGTATGCATCA	1980
MO_PA_NCB1	ATTGGGAAAGTCTGTAGGACTCTGTGTGGCTAAGTCGGTGTTC AATAGCCTGTATGCATCA	1980
MO_PA_pHW2000	ATTGGGAAAGTCTGTAGGACTCTGTGTGGCTAAGTCGGTGTTC AATAGCCTGTATGCATCA	1980
*****		
MO_PA_Virus	CCACAATTAGAAGGATTTTCAGCGGAGTCAAGAAAAC TGCTCTTGTGTTCAGGCTCTT	2040
MO_PA_NCB1	CCACAATTAGAAGGATTTTCAGCGGAGTCAAGAAAAC TGCTCTTGTGTTCAGGCTCTT	2040
MO_PA_pHW2000	CCACAATTAGAAGGATTTTCAGCGGAGTCAAGAAAAC TGCTCTTGTGTTCAGGCTCTT	2040
*****		
MO_PA_Virus	AGGGACAACCTCGAACCTGGGACCTTTGATCTTGGGGGGCTATATGAAGCAATTGAGGAG	2100
MO_PA_NCB1	AGGGACAACCTCGAACCTGGGACCTTTGATCTTGGGGGGCTATATGAAGCAATTGAGGAG	2100
MO_PA_pHW2000	AGGGACAACCTCGAACCTGGGACCTTTGATCTTGGGGGGCTATATGAAGCAATTGAGGAG	2100
*****		
MO_PA_Virus	TGCCTGATTAAATGATCCCTGGGTTTTGCTCAATGCGTCTTGGTTC AACTCCTTCTTGACA	2160
MO_PA_NCB1	TGCCTGATTAAATGATCCCTGGGTTTTGCTCAATGCGTCTTGGTTC AACTCCTTCTTGACA	2160
MO_PA_pHW2000	TGCCTGATTAAATGATCCCTGGGTTTTGCTCAATGCGTCTTGGTTC AACTCCTTCTTGACA	2160
*****		
MO_PA_Virus	CATGCATTAAATAGTTTATGGCAGTGTCTACTATTTGTTATCCGTACTGTCCAAAAAAGTA	2220
MO_PA_NCB1	CATGCATTAAATAGTTTATGGCAGTGTCTACTATTTGTTATCCGTACTGTCCAAAAAAGTA	2220
MO_PA_pHW2000	CATGCATTAAATAGTTTATGGCAGTGTCTACTATTTGTTATCCGTACTGTCCAAAAAAGTA	2220
*****		
MO_PA_Virus	CCTTGNNNNNNNN	2233
MO_PA_NCB1	CCTTGTTTCTACT	2233
MO_PA_pHW2000	CCTTGTTTCTACT	2233
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PA_NCB1	-----MEDFVRQCFNPMIVELAEKAMKEYGEDLKIETNKFAAICTHLEVCFMYSDFH	52
PA_pHW2000	SKSRY*FEMEDFVRQCFNPMIVELAEKAMKEYGEDLKIETNKFAAICTHLEVCFMYSDFH	59
	*****	
PA_NCB1	FINEQGESIVVELDDPNALLKHRFEIIIEGRDRTMAWTVVNSICNTTGAEKPKFLPDLYDY	112
PA_pHW2000	FINEQGESIVVELDDPNALLKHRFEIIIEGRDRTMAWTVVNSICNTTGAEKPKFLPDLYDY	119
	*****	
PA_NCB1	KENRFIEIGVTRREVHIYYLEKANKIKSENTHIHIFSFTGEEMATKADYTLDEESRARIK	172
PA_pHW2000	KENRFIEIGVTRREVHIYYLEKANKIKSENTHIHIFSFTGEEMATKADYTLDEESRARIK	179
	*****	
PA_NCB1	TRLFTIRQEMANRGLWDSFRQSERGEETIEEKFEISGTMRLADQSLPPNFSCLENFRAY	232
PA_pHW2000	TRLFTIRQEMANRGLWDSFRQSERGEETIEEKFEISGTMRLADQSLPPNFSCLENFRAY	239
	*****	
PA_NCB1	VDGFEPNGCIEGKLSQMSKEVNAKIEPFLKTTPRPPIKLPNGPPCYQRSKFLMDALKLSI	292
PA_pHW2000	VDGFEPNGCIEGKLSQMSKEVNAKIEPFLKTTPRPPIKLPNGPPCYQRSKFLMDALKLSI	299
	*****	
PA_NCB1	EDPSHEGEGIPLYDAIKCIKTFFGWKEPYIVKPHEKGINSNYLLSWKQVLSELQDIENEE	352
PA_pHW2000	EDPSHEGEGIPLYDAIKCIKTFFGWKEPYIVKPHEKGINSNYLLSWKQVLSELQDIENEE	359
	*****	
PA_NCB1	KIPRTKNMKKTSQLKWALGENMAPEKVDFDNCRDISDLKQYDSDEPELRSLSWIQNEFN	412
PA_pHW2000	KIPRTKNMKKTSQLKWALGENMAPEKVDFDNCRDISDLKQYDSDEPELRSLSWIQNEFN	419
	*****	
PA_NCB1	KACELTDSIWIELDEIGEDVAPIEYIASMRNRYFTAEVSHCRATEYIMKGVYINTALLNA	472
PA_pHW2000	KACELTDSIWIELDEIGEDVAPIEYIASMRNRYFTAEVSHCRATEYIMKGVYINTALLNA	479
	*****	
PA_NCB1	SCAAMDDFQLIPMISKCRTKEGRRKTNLYGFI IKGRSHLRNDTDVVNFVSMEFSLTDPRL	532
PA_pHW2000	SCAAMDDFQLIPMISKCRTKEGRRKTNLYGFI IKGRSHLRNDTDVVNFVSMEFSLTDPRL	539
	*****	
PA_NCB1	EPHKWEKYCVLEIGDMLLRSAIGQISRPMFLYVRTNGTSKVKMKWGMEMRRCLLQSLQQI	592
PA_pHW2000	EPHKWEKYCVLEIGDMLLRSAIGQISRPMFLYVRTNGTSKVKMKWGMEMRRCLLQSLQQI	599
	*****	
PA_NCB1	ESMIEAESSVKEKDMTKEFFENKSEAWPIGESPKGVEEGSIGKVCRTLLAKSVFNSLYAS	652
PA_pHW2000	ESMIEAESSVKEKDMTKEFFENKSEAWPIGESPKGVEEGSIGKVCRTLLAKSVFNSLYAS	659
	*****	
PA_NCB1	PQLEGFSAESRLLLLVVQALRDNLEPGTFDLGGLYEAIIECLINDPWVLLNASWFNSFLT	712
PA_pHW2000	PQLEGFSAESRLLLLVVQALRDNLEPGTFDLGGLYEAIIECLINDPWVLLNASWFNSFLT	719
	*****	
PA_NCB1	HALK-----	716
PA_pHW2000	HALK*LWQCYLLSVLSKKVPCFY	742
	****	