

Nucleotide sequence of the PA gene of influenza A/WSN/33(H1N1)

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The cloned DNA was cut with the appropriate restriction endonucleases and was subcloned into the M13 phage vectors mp18 and mp19 (1). The sequence was determined on both strands of the cDNA by the dideoxynucleotide chain termination method (2) using modified T7 polymerase sequenase. The PA gene of A/WSN contained 2233 nucleotides which can code for 716 amino acids and indicated a high homology (97%) to that of A/PR/8/34(H1N1) (3).

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3. Fields,S. and Winter,G. (1982) *Cell* **28**, 303-313.

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AGCGAAAGCAGGUACUGAUUCAAAAUGGAAGAUUUUGUGCGACAAUGCUUCAAUCCGAUGAUUGUCGAGCUU 72
                          M  E  D  F  V  R  Q  C  F  N  P  M  I  V  E  L (16)
GCGGAAAAGGCAAUGAAAGAGUAUGGAGAGGACCUGAAAAUCGAAACAAACAAAUUUGCAGCAAUAUGCACU 144
 A  E  K  A  M  K  E  Y  G  E  D  L  K  I  E  T  N  K  F  A  A  I  C  T (40)
CACUUGGAAGUGUGCUUCAUGUAUUCAGAUUUUCACUUCAUCGAUGAGCAAGGCGAGUCAAUAGUCGUAGAA 216
 H  L  E  V  C  F  M  Y  S  D  F  H  F  I  D  E  Q  G  E  S  I  V  V  E (64)
CUUGGCGAUCCAAAUGCACUUUUGAAGCACAGAUUUGAAAUAAUCGAGGGAAGAGAUCGCACAAUAGCCUGG 288
 L  G  D  P  N  A  L  L  K  H  R  F  E  I  I  E  G  R  D  R  T  I  A  W (88)
ACAGUAAUAAACAGUAUUUGCAACACUACAGGGGCUGAGAAACCAAAGUUUCUACCAGAUUUGUAUGAUUAC 360
 T  V  I  N  S  I  C  N  T  T  G  A  E  K  P  K  F  L  P  D  L  Y  D  Y (112)
AAGAAGAAUAGAUUCAUCGAAAUUGGAGUAACAAGGAGAGAAGUUCACAUAUACUAUCUGGAAAAGGCCAAU 432
 K  K  N  R  F  I  E  I  G  V  T  R  R  E  V  H  I  Y  Y  L  E  K  A  N (136)
AAAAUUAAAUCUGAGAAGACACACAUCCACAUUUUCUCAUUCACUGGGGAGGAAAUGGCCACAAAGGCCGAC 504
 K  I  K  S  E  K  T  H  I  H  I  F  S  F  T  G  E  E  M  A  T  K  A  D (160)
UACACUCUCGAUGAAGAAAGCAGGGCUAGGAUCAAAACCAGGCUAUUCACCAUAAGACAAGAAAUGGCUAGC 576
 Y  T  L  D  E  E  S  R  A  R  I  K  T  R  L  F  T  I  R  Q  E  M  A  S (184)
AGAGGCCUCUGGGAUUCCUUUCGUCAGUCCGAGAGAGGCGAAGAGACAAUUGAAGAAAGAUUUGAAAUCACA 648
 R  G  L  W  D  S  F  R  Q  S  E  R  G  E  E  T  I  E  E  R  F  E  I  T (208)
GGAACAAUGCGCAAGCUUGCCGACCAAAGUCUCCCGCCAAACUUCUCCAGCCUUGAAAAUUUUAGAGCCUAU 720
 G  T  M  R  K  L  A  D  Q  S  L  P  P  N  F  S  S  L  E  N  F  R  A  Y (232)
GUGGAUGGAUUCGAACCGAACGGCUACAUUGAGGGCAAGCUUUCUCAAAUGUCCAAAGAAGUAAAUGCUAGA 792
 V  D  G  F  E  P  N  G  Y  I  E  G  K  L  S  Q  M  S  K  E  V  N  A  R (256)
AUUGAACCUUUUUUGAAAUCAACACCACGACCACUUAGACUUCCGGAUGGGCCUCCCUGUUCUCAGCGGUCC 864
 I  E  P  F  L  K  S  T  P  R  P  L  R  L  P  D  G  P  P  C  S  Q  R  S (280)
AAAUUCCUGCUGAUGGAUGCCUUAAAAUUAAGCAUUGAGGACCCAAGUCAUGAGGGAGAGGGGAUACCGCUA 936
 K  F  L  L  M  D  A  L  K  L  S  I  E  D  P  S  H  E  G  E  G  I  P  L (304)
UAUGAUGCAAUCAAAUGCAUGAGAACAUUCUUUGGAUGGAAGGAACCCAAUGUUGUUAAACCACACGAAAAG 1008
 Y  D  A  I  K  C  M  R  T  F  F  G  W  K  E  P  N  V  V  K  P  H  E  K (328)
GGAAUAAAUCCAAAUUAUCUUCUGUCAUGGAAGCAAGUACUGGCAGAACUGCAGGACAUUGAGAAUGAGGAG 1080
 G  I  N  P  N  Y  L  L  S  W  K  Q  V  L  A  E  L  Q  D  I  E  N  E  E (352)
AAAAUUCCAAGGACUAAAAAUAUGAAGAAAACGAGUCAGUUAAAGUGGGCACUUGGUGAGAACAUGGCACCA 1152
 K  I  P  R  T  K  N  M  K  K  T  S  Q  L  K  W  A  L  G  E  N  M  A  P (376)
GAAAAGGUAGACUUUGACGAUUGUAAAGAUGUAGGCGAUUUGAAGCAAUAUGAUAGUGAUGAACCAGAAUUG 1224
 E  K  V  D  F  D  D  C  K  D  V  G  D  L  K  Q  Y  D  S  D  E  P  E  L (400)
AGGUCGCUUGCAAGUUGGAUUCAGAAUGAGUUCAACAAGGCAUGUGAACUGACCGAUUCAAGCUGGAUAGAG 1296
 R  S  L  A  S  W  I  Q  N  E  F  N  K  A  C  E  L  T  D  S  S  W  I  E (424)
CUCGAUGAGAUUGGAGAAGAUGCGGCUCCAAUUGAACACAUUGCAAGCAUGAGAAGGAAUUAUUUCACAGCA 1368
 L  D  E  I  G  E  D  A  A  P  I  E  H  I  A  S  M  R  R  N  Y  F  T  A (448)
GAGGUGUCUCAUUGCAGAGCCACAGAAUACAUAAUGAAGGGGGUGUACAUCAAUACUGCCUUGCUUAAUGCA 1440
 E  V  S  H  C  R  A  T  E  Y  I  M  K  G  V  Y  I  N  T  A  L  L  N  A (472)
UCCUGUGCAGCAAUGGAUGAUUUCCAAUUAAUUCCAAUGAUAAGCAAGUGUAGAACUAAGGAGGGAAGGCGA 1512
 S  C  A  A  M  D  D  F  Q  L  I  P  M  I  S  K  C  R  T  K  E  G  R  R (496)
AAGACCAAUUUGUACGGUUUCAUCAUAAAAGGAAGAUCCCACUUAAGGAAUGACACCGAUGUGGUAAACUUU 1584
 K  T  N  L  Y  G  F  I  I  K  G  R  S  H  L  R  N  D  T  D  V  V  N  F (520)
GUGAGCAUGGAGUUUUCCCUCACUGACCCAAGACUUGAACCACACAAAUGGGAGAAGUACUGUGUUCUUGAG 1656
 V  S  M  E  F  S  L  T  D  P  R  L  E  P  H  K  W  E  K  Y  C  V  L  E (544)
GUAGGAGAUAUGCUUCUAAGAAGUGCCAUAGGCCAUGUGUCAAGGCCUAUGUUCUUGUAUGUGAGGACAAAU 1728
 V  G  D  M  L  L  R  S  A  I  G  H  V  S  R  P  M  F  L  Y  V  R  T  N (568)
GGAACCUCAAAAAUUAAAAUGAAAUGGGGGAUGGAAAUGAGGCGUUGCCUCCUUCAGUCACUUCAACAAAUC 1800
 G  T  S  K  I  K  M  K  W  G  M  E  M  R  R  C  L  L  Q  S  L  Q  Q  I (592)
GAGAGUAUGAUUGAAGCUGAGUCCUCUGUCAAGGAGAAAGACAUGACCAAAGAGUUCUUUGAAAACAAAUCA 1872
 E  S  M  I  E  A  E  S  S  V  K  E  K  D  M  T  K  E  F  F  E  N  K  S (616)
GAAACAUGGCCCGUUGGAGAGUCCCCCAAAGGAGUGGAGGAAGGUUCCAUUGGGAAGGUCUGCAGAACUUUA 1944
 E  T  W  P  V  G  E  S  P  K  G  V  E  E  G  S  I  G  K  V  C  R  T  L (640)
UUGGCAAAGUCGGUAUUCAACAGCUUGUAUGCAUCUCCACAACUGGAAGGAUUUUCAGCUGAAUCAAGAAAA 2016
 L  A  K  S  V  F  N  S  L  Y  A  S  P  Q  L  E  G  F  S  A  E  S  R  K (664)
CUGCUUCUUAUCGUUCAGGCUCUUAGGGACAACCUGGAACCUGGGACCUUUGAUCUUGGGGGGCUAUAUGAA 2088
 L  L  L  I  V  Q  A  L  R  D  N  L  E  P  G  T  F  D  L  G  G  L  Y  E (688)
GCAAUUGAGGAGUGCCUGAUUAAUGAUCCCUGGGUUUUGCUUAAUGCUUCUUGGUUCAACUCCUUCCUCACA 2160
 A  I  E  E  C  L  I  N  D  P  W  V  L  L  N  A  S  W  F  N  S  F  L  T (712)
CAUGCAUUGAGAUAGUUGUGGCAAUGCUACUAUUUGCUAUCCAUACUGUCCAAAAAAGUACCUUGUUUCUAC 2232
 H  A  L  R  *                                                            (716)
U                                                                          2233
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Nucleotide sequence of the PA gene of A/WSN/33 written in the mRNA sense. The first 12 nucleotides were assumed to be the same as primer used for the cDNA synthesis.