

Suggested citation for this article: Jayawardena S, Cheung CY, Barr I, Chan KH, Chen H, Guan Y, et al. Loop-mediated isothermal amplification for influenza A (H5N1) virus. *Emerg Infect Dis.* 2007 Jun; [Epub ahead of print]

Loop-mediated Isothermal Amplification for Influenza A (H5N1) Virus

Shanthi Jayawardena,* Chung Y. Cheung,* Ian Barr,† Kwok H. Chan,* Honglin Chen,* Yi Guan,* J.S. Malik Peiris,* and Leo L.M. Poon*

*The University of Hong Kong, Hong Kong Special Administrative Region, People's Republic of China; and †World Health Organization Collaborating Centre for Influenza, Melbourne, Victoria, Australia

We describe a 1-step reverse-transcription loop-mediated isothermal amplification assay for detection of highly pathogenic avian influenza A (H5N1) viruses. The assay was tested by using a panel of highly pathogenic H5N1 subtypes isolated over the past 10 years and clinical specimens. The assay produced negative results for all non-H5N1 subtypes.

Highly pathogenic avian influenza A (H5N1) virus has had a significant global effect on the poultry industry, human healthcare, and many other sectors (1). Several molecular tests have been developed for the rapid detection of influenza (H5) virus subtypes (2), but they often require sophisticated equipment (e.g., PCR machine) and are difficult for researchers and clinicians to perform in resource-limited settings. Loop-mediated isothermal amplification (LAMP) provides a molecular testing option for this scenario (3). The LAMP mechanism has been described (3,4). Using this approach, nucleic acids are amplified under isothermal conditions (e.g., in a water bath) with high specificity, efficiency, and speed (3). The assay is highly specific due to recognition of target DNA by 6 independent sequences. An attractive feature of LAMP is its ability to generate large amounts of white magnesium pyrophosphate precipitate in positive reactions (4). Examples of positive and negative reactions are shown in Appendix Figure 1. LAMP enables easy visual identification of positive reactions (4,5) and

avoids additional cost and labor for postamplification analysis. This closed-tube method can also minimize the problem of carryover contamination in less controlled environments.

The Study

We aimed to develop a reverse transcription (RT) LAMP assay that could detect a variety of highly pathogenic influenza (H5N1) viruses. For primer design, we used highly pathogenic influenza (H5N1) sequences publicly available from the Influenza Sequence Database (www.flu.lanl.gov/index.html) in August 2006. We used hemagglutinin (HA) from an influenza (H5N1) prototype vaccine strain (A/Vietnam/1203/2004, GenBank accession no. AY651334) as the reference for this study. The sequences included highly pathogenic influenza (H5N1) viruses identified in the past 2 years. In addition, sequences from all the other HA subtypes (e.g., 1,127 for H1 and 1,472 for H3) in the above database were used for the analysis. Because highly pathogenic influenza (H5N1) gene sequences are genetically diverse, all studied H5 sequences (n = 711) were aligned, and a highly conserved region at the 5' end of HA2 encoding sequence (corresponding to nt 1,065–1,298 of the reference sequence) was selected as the target (Appendix Figure 2A and 3). Of all the downloaded highly pathogenic influenza (H5N1) sequences, 115 did not contain the target site and were excluded from analysis. The GenBank accession numbers for the highly pathogenic influenza (H5N1) sequences used for the primer design are listed in the Appendix Table.

Previous demonstration that degenerate primers could be used in LAMP assays (6) led us to use the same approach for designing a set of degenerate primers for the targeted region (Appendix Figure 2B). Our HA sequence analysis also showed that HA sequences from influenza (H5N2) viruses of North American lineage and other viruses with other HA subtypes contain extensive mismatches to the primers used in the LAMP assay (online Appendix Figure 2A, B). In the initial phase of the study, we used the reference strain (A/Vietnam/1203/2004) to determine the sensitivity of the assay. Purified RNA from a viral supernatant with a known titer was serially diluted and subjected to the LAMP assay. As shown in the Figure, panel A, the detection limit of the assay was found to be 2×10^{-3} plaque-forming units (pfu) per reaction. The sensitivity of this assay was also compared with that of an optimized RT-PCR assay recommended by the World Health Organization (7). As shown in the Figure, panel A, the

detection limit of the RT-PCR assay was identical to that from the LAMP assay. We also spiked various amounts of influenza (H5) viruses into non-H5 nasopharyngeal aspirate samples and tested the purified RNA from these clinical specimens by the LAMP and RT-PCR assays. The results from these assays were identical (data not shown). These findings are in accordance with previous findings that the sensitivity of LAMP assays is comparable to that of conventional PCR methods (5,6,8). In addition, all positive reactions were visually examined for the presence of white precipitate at the end of the reaction incubation. As expected, all results correlated exactly with those deduced by the real-time turbidity meter (data not shown).

We also tested the feasibility of using this assay to detect influenza (H5) viruses in clinical specimens from a patient with influenza (H5). RNA from 2 different postmortem lung tissue samples from a patient infected with influenza A/HK/212/03 was subjected to the LAMP assay. As shown in the Figure, panel B, both RNA samples had positive results for the influenza (H5) viruses.

To evaluate the specificity of the LAMP assay for influenza (H5) viruses, a comparative study including all 16 HA subtypes and a variety of H5N1 strains was performed (Table). All 14 H5N1 strains isolated from different geographic regions during the past 10 years were positive, whereas none of the non-H5 samples were positive (Table). All the reactions were visually examined, and the results corresponded with those generated from the real-time turbidity meter. Influenza A/chicken/Wajo/BBVM/2005, A/duck/Vietnam/568/2005, and A/bar-headed goose/Qinghai/5/2005 are clade 2 influenza (H5N1) viruses that have recently emerged from different geographic regions (9), and these 3 viruses are phylogenetically distinct (10,11). Our results demonstrate that this assay is applicable to a wide variety of highly pathogenic influenza (H5N1) viruses. In addition, other virus reassortants with the HA of this lineage are expected to be positive in the assay.

We previously demonstrated that heat-treated blood samples could be directly tested by a LAMP assay specific for DNA of a bloodborne pathogen (5). These modifications could avoid the need for nucleic acid purification, thereby reducing the cost and turnaround time for molecular diagnosis. We tested the feasibility of detecting the H5 sequence from viral cultures without RNA extraction. In a Biosafety Level 3 facility, 50 μ L of viral culture of the prototype virus was heat inactivated (99°C for 10 min), the heat-treated sample was serially diluted with

standard viral culture medium, and 2 μ L of serially diluted samples was added to the LAMP assay. As shown in the Figure, panel C, and in online Appendix Figure 1, H5N1 subtype could still be detected by the assay. However, the detection limit (9.6 pfu/reaction) was $\approx 1,000\times$ less sensitive than the limit with purified RNA as an input.

Conclusions

The RT-LAMP assay is highly specific, and its sensitivity is comparable to that of an optimized RT-PCR assay for influenza (H5N1) viruses. The detection limit is equivalent to that of a similar LAMP assay (12), but our assay was extensively tested by using a wide variety of influenza (H5) viruses, including recent clade 2 influenza (H5) viruses (9). LAMP does not require thermocyclers and gel electrophoresis. Reactions can simply be incubated in a water bath or heating block, and the results can be confirmed by direct visual inspection. Because early identification of influenza (H5) is crucial for the containment of the disease, this novel assay can provide an efficient option for the preliminary molecular detection of highly pathogenic influenza (H5) viruses in basic laboratory or clinical settings. Combined with the use of a turbidity meter, which costs much less than a real-time RT-PCR system, RT-LAMP can provide quantitative data for viral load studies. In conclusion, the LAMP assay is a promising tool for the detection of influenza (H5) viruses.

Acknowledgments

We thank Bonnie W.Y. Wong for her technical assistance.

We acknowledge research funding from Public Health Research Grant A195357 from the US National Institutes of Health, the Research Grant Council of Hong Kong (HKU 7530/06M), and the Seed Funding Programme for Basic Research from HKU.

Ms Jayawardena is a PhD student in the Department of Microbiology of The University of Hong Kong. Her research interests mainly relate to the molecular biology of influenza viruses.

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Address for correspondence: Leo L.M. Poon, Department of Microbiology, The University of Hong Kong, Queen Mary Hospital, Pokfulam, Hong Kong Special Administrative Region, People's Republic of China; email: llmpoon@hkucc.hku.hk

Table. RT-LAMP assay results for highly pathogenic influenza A (H5N1)*

Virus subtype	Strain	Result
H1	A/HK/54/98	-
H2	A/Singapore/57	-
H3	A/HK/1174/99	-
H4	A/duck/HK/MPA892/06	-
H5N1	A/HK/483/97	+
H5N1	A/HK/486/97	+
H5N1	A/chicken/HK/61.9/2002	+
H5N1	A/goose/HK/739.2/2002	+
H5N1	A/HK/213/03	+
H5N1	A/HK/212/03	+
H5N1	A/Thailand/MK2/04	+
H5N1	A/Vietnam/1203/04	+
H5N1	A/chicken/Indonesia/4/2004	+
H5N1	A/chicken/Thailand/1/2004	+
H5N1	A/chicken/Vietnam/33/2004	+
H5N1	A/chicken/Wajo/BBVM/2005	+
H5N1	A/duck/Vietnam/568/2005	+
H5N1	A/bar-headed goose/Qinghai/5/2005	+
H6	A/teal/HK/W312/97	-
H7	A/env/HK/MPB127/05	-
H8	A/duck/HK/MP4275/2005	-
H9	A/duck/HK/G1/97	-
H10	A/env/HK/MPB839/05	-
H11	A/env/HK/MPB1679/06	-
H12	A/red necked stint/WA/5745/1984	-
H13	A/gull/Maryland/704/1977	-
H14	A/mallard/Gurjev/244/1982	-
H15	A/shelduck/WA/1762/1979	-
H16	A/gull/Denmark/68110/2002	-

*RT-LAMP, reverse transcription loop-mediated isothermal amplification; -, negative; +, positive.

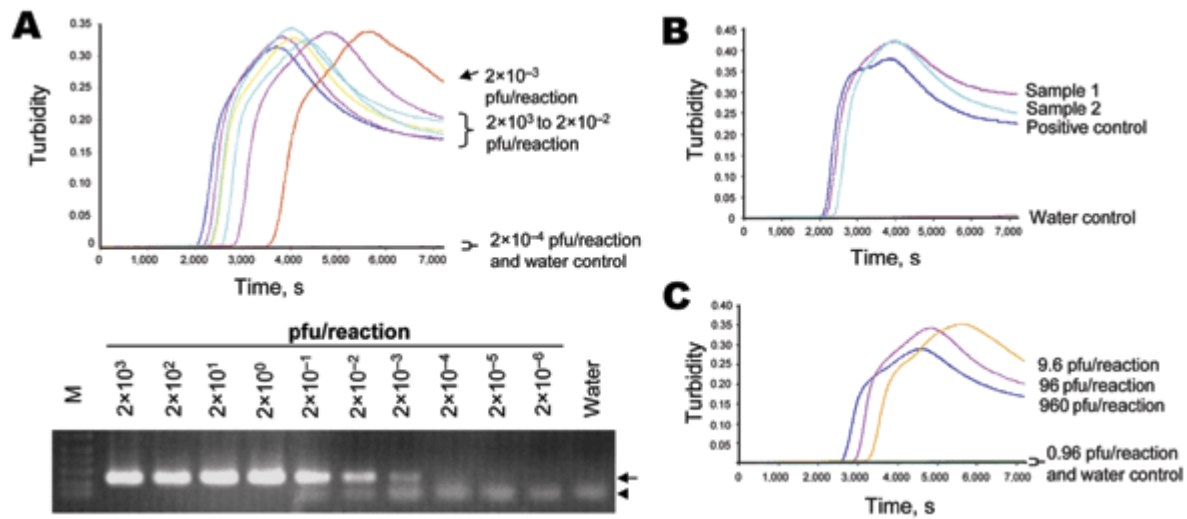


Figure. Detection of influenza (H5) virus by loop-mediated isothermal amplification (LAMP). A) Serially diluted RNA from A/Vietnam/1203/2004 was tested by the reverse transcription (RT)–LAMP (upper panel) and RT-PCR (lower panel) assays. The viral titers used in these reactions are indicated. Viral RNA was extracted by using the QIAamp Viral RNA Mini Kit (QIAGEN, Valencia, CA, USA) according to the manufacturer’s instructions. For a typical 25- μ L reaction, 2 μ L of sample was mixed with 2 \times in-house reaction buffer (40 mmol/L Tris-HCl, pH 8.8; 20 mmol/L KCl; 16 mmol/L MgSO₄; 20 mmol/L [NH₄]₂SO₄; 0.2% Tween 20 [v/v]; 1.6 mol/L betaine; 2.8 mmol/L each dNTP), 50 U *Bst* DNA polymerase (New England Biolabs, Ipswich, MA, USA), 8 U avian myeloblastosis virus reverse transcriptase (Invitrogen, Gaithersburg, MD, USA), 40 pmol/L primers FIP and BIP, 20 pmol/L primers LPF and LPR, and 5 pmol/L primers F3 and B3. Reaction mixtures were incubated at 60°C for 120 min, and the turbidity of these reactions was examined by use of a turbidity meter (LA-200, Treamecs; Kyoto, Japan) in real time. The turbidities of these reactions 5–20 min after incubation were taken as the baseline. The threshold value for a positive reaction was set to be 10 \times above the standard deviation of the baseline. For the H5-specific RT-PCR assay, primers H5-1 (5'-GCCATTCCACAACATACACCC-3') and H5-3 (5'-CTCCCCTGCTCATTGCTATG-3') were used according to the protocol optimized by the World Health Organization H5 Reference Laboratory Network (7). Positive (219 bp) and nonspecific products from the PCR reaction are highlighted by the arrow and arrowhead, respectively. B) Detection of H5 virus in postmortem lung tissues from a patient with influenza (H5). Signals from the tested samples, positive control, and water control are indicated. C) Direct detection of influenza (H5) viruses from culture supernatants. Heat-treated supernatant from cells infected with A/Vietnam/1203/2004 were serially diluted and directly used as input in the LAMP assay. The plaque-forming units (pfu) of influenza (H5) virus in these reactions are shown.

Appendix Table. Influenza A virus (H5N1) sequences used in the primer design

Accession number Strains

gi|58531088|gb|AB166862|/Avian/4(HA)/H5N1/Japan/2004/// Influenza A virus (A/chicken/Yamaguchi/7/2004(H5N1)) HA gene for hemagglutinin, complete cds.
gi|58531120|gb|AB188816|/Avian/4(HA)/H5N1/Japan/2004/// Influenza A virus (A/chicken/Oita/8/2004(H5N1)) HA gene for hemagglutinin, complete cds.
gi|58531138|gb|AB188824|/Avian/4(HA)/H5N1/Japan/2004/// Influenza A virus (A/chicken/Kyoto/3/2004(H5N1)) HA gene for hemagglutinin, complete cds.
gi|58531156|gb|AB189053|/Avian/4(HA)/H5N1/Japan/2004/// Influenza A virus (A/crow/Kyoto/53/2004(H5N1)) HA gene for hemagglutinin, complete cds..
gi|58531174|gb|AB189061|/Avian/4(HA)/H5N1/Japan/2004/// Influenza A virus (A/crow/Osaka/102/2004(H5N1)) HA gene for hemagglutinin, complete cds..
gi|71013497|gb|AB212054|/Human/4(HA)/H5N1/Hong Kong/2003/// Influenza A virus (A/Hong Kong/213/03(H5N1)) HA gene for hemagglutinin, complete cds, MDCK isolate, embryonated chicken egg isolate.
gi|71000185|gb|AB212280|/Avian/4(HA)/H5N1/Japan/2003/// Influenza A virus (A/duck/Yokohama/aq10/2003(H5N1)) HA gene for hemagglutinin, complete cds..
gi|78210824|gb|AB212649|/Avian/4(HA)/H5N1/Japan/2004/// Influenza A virus (A/blow fly/Kyoto/93/2004(H5N1)) HA gene for hemagglutinin, complete cds.
gi|81687114|gb|AB233319|/Avian/4(HA)/H5N1/Mongolia/2005/// Influenza A virus (A/bar-headed goose/Mongolia/1/05(H5N1)) HA gene for hemagglutinin, complete cds.
gi|81687118|gb|AB233320|/Avian/4(HA)/H5N1/Mongolia/2005/// Influenza A virus (A/whooper swan/Mongolia/3/05(H5N1)) HA gene for hemagglutinin, complete cds.
gi|81687122|gb|AB233321|/Avian/4(HA)/H5N1/Mongolia/2005/// Influenza A virus (A/whooper swan/Mongolia/4/05(H5N1)) HA gene for hemagglutinin, complete cds.
gi|81687126|gb|AB233322|/Avian/4(HA)/H5N1/Mongolia/2005/// Influenza A virus (A/whooper swan/Mongolia/6/05(H5N1)) HA gene for hemagglutinin, complete cds.
gi|78096575|gb|AB239125|/Human/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/Hanoi/30408/2005(H5N1)) HA gene for hemagglutinin, complete cds.
gi|50296078|gb|AY651347|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Ck/HK/37.4/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296080|gb|AY651348|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Sc/HK/YU100/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|109809721|gb|AB263752|/Avian/4(HA)/H5N1/Mongolia/2006/// Influenza A virus (A/whooper swan/Mongolia/2/06(H5N1)) genomic RNA, segment 4, complete sequence.
gi|50296106|gb|AY651361|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/tree sparrow/HK/864/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296108|gb|AY651362|/Avian/4(HA)/H5N1/Hong Kong/2004/// Influenza A virus (A/peregrine falcon/HK/D0028/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296110|gb|AY651363|/Avian/4(HA)/H5N1/China/2003/// Influenza A virus (A/Dk/HN/5806/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296120|gb|AY651368|/Avian/4(HA)/H5N1/China/2003/// Influenza A virus (A/Ck/ST/4231/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296122|gb|AY651369|/Avian/4(HA)/H5N1/China/2003/// Influenza A virus (A/Dk/YN/6255/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296124|gb|AY651370|/Avian/4(HA)/H5N1/China/2003/// Influenza A virus (A/Dk/YN/6445/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50365728|gb|AY653200|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Jilin/9/2004(H5N1)) segment 4, complete sequence.
gi|9863876|gb|AF216713|/Avian/4(HA)/H5N1/Hong Kong/1999/// Influenza A virus (A/Environment/Hong Kong/437-4/99 (H5N1)) hemagglutinin 5 gene, complete cds.
gi|9863895|gb|AF216721|/Avian/4(HA)/H5N1/Hong Kong/1999/// Influenza A virus (A/Environment/Hong Kong/437-6/99 (H5N1)) hemagglutinin 5 gene, complete cds.
gi|9863913|gb|AF216729|/Avian/4(HA)/H5N1/Hong Kong/1999/// Influenza A virus (A/Environment/Hong Kong/437-8/99 (H5N1)) hemagglutinin 5 gene, complete cds.
gi|9863931|gb|AF216737|/Avian/4(HA)/H5N1/Hong Kong/1999/// Influenza A virus (A/Environment/Hong Kong/437-10/99 (H5N1)) hemagglutinin 5 gene, complete cds.
gi|13676824|gb|AF364334|/Avian/4(HA)/H5N1/China/1997/// Influenza A virus (A/Goose/Guangdong/3/97(H5N1)) segment 4 hemagglutinin (HA) gene, complete cds.
gi|18092165|gb|AF398417|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Goose/Hong Kong/385.3/2000(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|18092167|gb|AF398418|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Goose/Hong Kong/385.5/2000(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|47600774|gb|AJ715872|/Human/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Hanoi/03/2004(H5N1)) partial HA gene for hemagglutinin, genomic RNA
gi|56311401|gb|AJ867074|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Haty/2004(H5N1)) HA gene for hemagglutinin, genomic RNA
gi|109941929|gb|AM183669|/Avian/4(HA)/H5N1/Indonesia/2003/// Influenza A virus (A/chicken/China/1204/04(H5N1)) partial H5HA gene for hemagglutinin, genomic RNA
gi|109941931|gb|AM183670|/Avian/4(HA)/H5N1/Indonesia/2005/// Influenza A virus (A/chicken/China/1204/04(H5N1)) H5HA gene for hemagglutinin, genomic RNA
gi|109941933|gb|AM183671|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Indonesia/R134/03(H5N1)) H5HA gene for hemagglutinin, genomic RNA
gi|109941935|gb|AM183672|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/chicken/Indonesia/R134/03(H5N1)) H5HA gene for hemagglutinin, genomic RNA
gi|109941937|gb|AM183673|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/chicken/Indonesia/R60/05(H5N1)) H5HA gene for hemagglutinin, genomic RNA
gi|109941939|gb|AM183674|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/chicken/Indonesia/R60/05(H5N1)) H5HA gene for hemagglutinin, genomic RNA
gi|109941941|gb|AM183675|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/chicken/Vietnam/P22/05(H5N1)) partial H5HA gene for hemagglutinin, genomic RNA
gi|109941943|gb|AM183676|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/chicken/Vietnam/P22/05(H5N1)) partial H5HA gene for hemagglutinin, genomic RNA
gi|109941945|gb|AM183677|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/chicken/Vietnam/P41/05(H5N1)) H5HA gene for hemagglutinin, genomic RNA
gi|54402286|gb|AY626143|/Human/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Thailand/4(SP-528)/2004(H5N1)) hemagglutinin gene, complete cds.
gi|54299827|gb|AY627885|/Human/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Thailand/5(KK-494)/2004(H5N1)) hemagglutinin gene, complete cds.
gi|110319972|gb|AM262541|/Avian/4(HA)/H5N1/Nigeria/2006/// Influenza A virus (A/chicken/Lagos.NIE/10.06/BA209(H5N1)) partial HA gene for hemagglutinin, genomic RNA
gi|110319974|gb|AM262542|/Avian/4(HA)/H5N1/Nigeria/2006/// Influenza A virus (A/chicken/Lagos.NIE/10.06/BA210(H5N1)) partial HA gene for hemagglutinin, genomic RNA
gi|110319976|gb|AM262543|/Avian/4(HA)/H5N1/Nigeria/2006/// Influenza A virus (A/chicken/Lagos.NIE/10.06/BA211(H5N1)) partial HA gene for hemagglutinin, genomic RNA
gi|110319978|gb|AM262546|/Avian/4(HA)/H5N1/Nigeria/2006/// Influenza A virus (A/chicken/Lagos.NIE/8.06/SO300(H5N1)) partial HA gene for hemagglutinin, genomic RNA
gi|110319980|gb|AM262547|/Avian/4(HA)/H5N1/Nigeria/2006/// Influenza A virus (A/chicken/Lagos.NIE/8.06/SO452(H5N1)) partial HA gene for hemagglutinin, genomic RNA
gi|110319982|gb|AM262553|/Avian/4(HA)/H5N1/Nigeria/2006/// Influenza A virus (A/chicken/Lagos.NIE/8.06/SO493(H5N1)) partial HA gene for hemagglutinin, genomic RNA
gi|110319984|gb|AM262572|/Avian/4(HA)/H5N1/Nigeria/2006/// Influenza A virus (A/chicken/Lagos.NIE/8.06/SO494(H5N1)) partial HA gene for hemagglutinin, genomic RNA
gi|19697757|gb|AY059474|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Goose/Hong Kong/ww26/2000(H5N1)) segment 4 hemagglutinin (HA) gene, partial cds.
gi|19697759|gb|AY059475|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Goose/Hong Kong/ww28/2000(H5N1)) segment 4 hemagglutinin (HA) gene, partial cds.
gi|19697761|gb|AY059476|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Duck/Hong Kong/ww381/2000(H5N1)) segment 4 hemagglutinin (HA) gene, partial cds.
gi|19697763|gb|AY059477|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Duck/Hong Kong/ww382/2000(H5N1)) segment 4 hemagglutinin (HA) gene, partial cds.
gi|19697765|gb|AY059478|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Duck/Hong Kong/ww461/2000(H5N1)) segment 4 hemagglutinin (HA) gene, partial cds.
gi|19697767|gb|AY059479|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Duck/Hong Kong/ww487/2000(H5N1)) segment 4 hemagglutinin (HA) gene, partial cds.
gi|19697769|gb|AY059480|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Goose/Hong Kong/ww491/2000(H5N1)) segment 4 hemagglutinin (HA) gene, partial cds.
gi|19697771|gb|AY059481|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Duck/Hong Kong/2986.1/2000(H5N1)) segment 4 hemagglutinin (HA) gene, partial cds.
gi|19697773|gb|AY059482|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Goose/Hong Kong/3014.8/2000(H5N1)) segment 4 hemagglutinin (HA) gene, partial cds.
gi|21326672|gb|AY075027|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/317.5/2001(H5N1)) hemagglutinin H5 (H5) gene, complete cds.
gi|21326674|gb|AY075030|/Avian/4(HA)/H5N1/Hong Kong/2000/// Influenza A virus (A/Goose/Hong Kong/3014.5/2000(H5N1)) hemagglutinin H5 (H5) gene, complete cds.
gi|50296050|gb|AY651333|/Human/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Viet Nam/1194/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28805557|gb|AY221521|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/HongKong/NT873.3/01-MB(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28806384|gb|AY221522|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/HongKong/NT873.3/01(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28807284|gb|AY221523|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/HongKong/FY150/01-MB(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28807565|gb|AY221524|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/HongKong/FY150/01(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28808108|gb|AY221525|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Pheasant/HongKong/FY155/01-MB(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28808463|gb|AY221526|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Pheasant/HongKong/FY155/01(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28809438|gb|AY221527|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/HongKong/YU822.2/01-MB(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28810155|gb|AY221528|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/HongKong/YU822.2/01(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28810752|gb|AY221529|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/HongKong/YU562/01(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|41207462|gb|AY518362|/Avian/4(HA)/H5N1/China/2003/// Influenza A virus (A/duck/China/E319.2-03(H5N1)) hemagglutinin subtype H5 (H5) gene, complete cds.
gi|50296072|gb|AY651344|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Dk/Viet Nam/11/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296074|gb|AY651345|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Gf/HK/38/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296076|gb|AY651346|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Ck/HK/31.2/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|66775624|gb|DQ023145|/Avian/4(HA)/H5N1/China/2002/// Influenza A virus (A/chicken/China/1/02(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|67527197|gb|DQ076201|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Ck/Thailand/73/2004(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|50296082|gb|AY651349|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Ck/HK/YU22/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296084|gb|AY651350|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Ck/HK/3176.3/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296086|gb|AY651351|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Ck/HK/3169.1/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296088|gb|AY651352|/Avian/4(HA)/H5N1/China/2002/// Influenza A virus (A/teal/China/2978.1/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296090|gb|AY651353|/Avian/4(HA)/H5N1/Hong Kong/2003/// Influenza A virus (A/Ck/HK/2133.1/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296092|gb|AY651354|/Avian/4(HA)/H5N1/Hong Kong/2003/// Influenza A virus (A/Ck/HK/NT93/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296094|gb|AY651355|/Avian/4(HA)/H5N1/Hong Kong/2003/// Influenza A virus (A/Ck/HK/WF157/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296096|gb|AY651356|/Avian/4(HA)/H5N1/Hong Kong/2003/// Influenza A virus (A/Ck/HK/SSP141/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296098|gb|AY651357|/Avian/4(HA)/H5N1/Hong Kong/2003/// Influenza A virus (A/Ck/HK/FY157/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296100|gb|AY651358|/Avian/4(HA)/H5N1/Hong Kong/2003/// Influenza A virus (A/Ck/HK/YU324/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296102|gb|AY651359|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/grey heron/HK/861.1/2002(H5N1)) hemagglutinin (HA) gene, partial cds.

gi|50296104|gb|AY615360|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/feral pigeon/HK/862.7/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|71277618|gb|DQ083561|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Nakhon Sawan/Thailand/CU-13/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277620|gb|DQ083562|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Nakhon Pathom/Thailand/CU-14/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277622|gb|DQ083563|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/crow/Bangkok/Thailand/CU-15/04(H5N1)) hemagglutinin gene, complete cds.
gi|50296112|gb|AY615364|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/Dk/HN/303/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296114|gb|AY615365|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/Dk/HN/101/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296116|gb|AY615366|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/Ph/ST/44/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296118|gb|AY615367|/Avian/4(HA)/H5N1/China/2003/// Influenza A virus (A/Dk/ST/4003/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|71277632|gb|DQ083568|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Bangkok/Thailand/CU-20/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277634|gb|DQ083569|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Ayutthaya/Thailand/CU-24/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277636|gb|DQ083570|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/crow/Bangkok/Thailand/CU-25/04(H5N1)) hemagglutinin gene, partial cds.
gi|50296126|gb|AY615371|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/Ck/YN/374/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296128|gb|AY615372|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/Ck/YN/115/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296130|gb|AY615373|/Avian/4(HA)/H5N1/Hong Kong/2003/// Influenza A virus (A/black headed gull/HK/12.1/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|71277644|gb|DQ083574|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/strich/Samut Prakan/Thailand/CU-31/04(H5N1)) hemagglutinin gene, partial cds.
gi|56548871|gb|AY676033|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/duck/Hong Kong/821/02(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|56548873|gb|AY676034|/Avian/4(HA)/H5N1/Hong Kong/2003/// Influenza A virus (A/egret/Hong Kong/757.2/03(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|56548875|gb|AY676035|/Avian/4(HA)/H5N1/South Korea/2003/// Influenza A virus (A/chicken/Korea/ES/03(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|56548877|gb|AY676036|/Avian/4(HA)/H5N1/South Korea/2003/// Influenza A virus (A/duck/Korea/ESD1/03(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|50843949|gb|AY679514|/Human/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Thailand/LFPN-2004/2004(H5N1)) hemagglutinin mRNA, complete cds.
gi|50956627|gb|AY684706|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Hubei/327/2004(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|46578137|gb|AY555150|/Human/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Thailand/1(KAN-1)/2004(H5N1)) hemagglutinin gene, partial cds.
gi|45453833|gb|AY555153|/Human/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Thailand/2(SP-33)/2004(H5N1)) hemagglutinin gene, complete cds.
gi|46318020|gb|AY574187|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/chicken/Vietnam/HD1/2004(H5N1)) hemagglutinin gene, partial cds.
gi|46318026|gb|AY574190|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/chicken/Vietnam/HD2/2004(H5N1)) hemagglutinin gene, partial cds.
gi|47834859|gb|AY575869|/Human/4(HA)/H5N1/Hong Kong/2003/// Influenza A virus (A/HK/212/03 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|47834861|gb|AY575870|/Human/4(HA)/H5N1/Hong Kong/2003/// Influenza A virus (A/HK/213/03 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|47834863|gb|AY575871|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Gs/HK/739.2/02 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|47834865|gb|AY575872|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Eg/HK/757.3/02 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|47834875|gb|AY575873|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/G.H.HK/793.1/02 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|47834877|gb|AY575874|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Dk/HK/821/02 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|911984124|gb|DQ095617|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/Bar-headed Goose/Qinghai/5/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|47834881|gb|AY575876|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Ck/HK/61.9/02 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|47834883|gb|AY575877|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Ck/HK/YU777/02 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|57916028|gb|AY737296|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Yangtze/178/04(H5N1)) segment 4, complete sequence.
gi|57916076|gb|AY737304|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Guangdong/173/04(H5N1)) segment 4, complete sequence.
gi|47834889|gb|AY575880|/Avian/4(HA)/H5N1/Hong Kong/2002/// Influenza A virus (A/Ph/HK/675.14/02 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|45934598|gb|AY576927|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/chicken/Vietnam/CM/2004(H5N1)) segment 4 hemagglutinin gene, partial cds.
gi|45934604|gb|AY576930|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/muscovy duck/Vietnam/MdGL/2004(H5N1)) segment 4 hemagglutinin gene, partial cds.
gi|46578415|gb|AY577314|/Human/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Thailand/3(SP-83)/2004(H5N1)) hemagglutinin gene, complete cds.
gi|47156268|gb|AY585357|/Avian/4(HA)/H5N1/China/2002/// Influenza A virus (A/duck/Fujian/01/2002(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156270|gb|AY585358|/Avian/4(HA)/H5N1/China/2002/// Influenza A virus (A/duck/Fujian/13/2002(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156272|gb|AY585359|/Avian/4(HA)/H5N1/China/2000/// Influenza A virus (A/duck/Fujian/19/2000(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156274|gb|AY585360|/Avian/4(HA)/H5N1/China/2001/// Influenza A virus (A/duck/Guangdong/01/2001(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156276|gb|AY585361|/Avian/4(HA)/H5N1/China/2000/// Influenza A virus (A/duck/Guangdong/12/2000(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|55247877|gb|AY779048|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/duck/Thailand/CU-2/2004 (H5N1)) hemagglutinin gene, partial cds.
gi|47156280|gb|AY585363|/Avian/4(HA)/H5N1/China/1999/// Influenza A virus (A/duck/Guangxi/07/1999(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156282|gb|AY585364|/Avian/4(HA)/H5N1/China/2001/// Influenza A virus (A/duck/Guangxi/22/2001(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156284|gb|AY585365|/Avian/4(HA)/H5N1/China/2001/// Influenza A virus (A/duck/Guangxi/35/2001(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156286|gb|AY585366|/Avian/4(HA)/H5N1/China/2002/// Influenza A virus (A/duck/Guangxi/53/2002(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156288|gb|AY585367|/Avian/4(HA)/H5N1/China/2001/// Influenza A virus (A/duck/Shanghai/13/2001(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156290|gb|AY585368|/Avian/4(HA)/H5N1/China/2002/// Influenza A virus (A/duck/Shanghai/35/2002(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156292|gb|AY585369|/Avian/4(HA)/H5N1/China/2002/// Influenza A virus (A/duck/Shanghai/37/2002(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156294|gb|AY585370|/Avian/4(HA)/H5N1/China/2001/// Influenza A virus (A/duck/Shanghai/08/2001(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156296|gb|AY585371|/Avian/4(HA)/H5N1/China/2000/// Influenza A virus (A/duck/Zhejiang/11/2000(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156298|gb|AY585372|/Avian/4(HA)/H5N1/China/2001/// Influenza A virus (A/duck/Fujian/17/2001(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156300|gb|AY585373|/Avian/4(HA)/H5N1/China/2000/// Influenza A virus (A/duck/Guangdong/07/2000(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156302|gb|AY585374|/Avian/4(HA)/H5N1/China/2000/// Influenza A virus (A/duck/Guangdong/40/2000(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156304|gb|AY585375|/Avian/4(HA)/H5N1/China/2001/// Influenza A virus (A/duck/Guangxi/50/2001(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156306|gb|AY585376|/Avian/4(HA)/H5N1/China/2001/// Influenza A virus (A/duck/Shanghai/38/2001(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|47156308|gb|AY585377|/Avian/4(HA)/H5N1/China/2000/// Influenza A virus (A/duck/Zhejiang/52/2000(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|46361433|gb|AY590563|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Thailand/CU-K1/2004(H5N1)) hemagglutinin gene, partial cds.
gi|48431281|gb|AY590568|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Nakorn-Pathom/Thailand/CU-K2/2004(H5N1)) hemagglutinin gene, partial cds.
gi|46361437|gb|AY590569|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/kalij pheasant/Thailand/CU-4/2004(H5N1)) hemagglutinin gene, partial cds.
gi|46361439|gb|AY590570|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/white peafowl/Thailand/CU-11/2004(H5N1)) hemagglutinin gene, partial cds.
gi|62466140|gb|AY972540|/Tiger/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/tiger/Thailand/CU-T5/04(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|62466142|gb|AY972541|/Tiger/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/tiger/Thailand/CU-T6/04(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|62466144|gb|AY972542|/Tiger/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/tiger/Thailand/CU-T8/04(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|62910858|gb|DQ003215|/Avian/4(HA)/H5N1/China/2001/// Influenza A virus (A/chicken/Jiande/1218/2001(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|76800619|gb|DQ211925|/Avian/4(HA)/H5N1/China/2003/// Influenza A virus (A/chicken/luohuo/3/03(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|77641488|gb|DQ212792|/Avian/4(HA)/H5N1/Russia/2005/// Influenza A virus (A/goose/Novosibirsk/4/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|46361445|gb|AY590577|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/openbill/Thailand/CU-2/2004(H5N1)) hemagglutinin gene, partial cds.
gi|47716772|gb|AY609312|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Guangdong/174/04(H5N1)) segment 4, complete sequence.
gi|50952819|gb|AY623430|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Yichang/lung-1/04(H5N1)) hemagglutinin gene, partial cds.
gi|78146083|gb|DQ231241|/Avian/4(HA)/H5N1/Russia/2005/// Influenza A virus (A/chicken/Suzdalka/Nov-12/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|78146106|gb|DQ231242|/Avian/4(HA)/H5N1/Russia/2005/// Influenza A virus (A/chicken/Suzdalka/Nov-11/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|49356775|gb|AY639405|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/goose/China/F3/2004(H5N1)) hemagglutinin (H5) gene, complete cds.
gi|50083230|gb|AY646167|/Tiger/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/tiger/Suphanburi/Thailand/Ti-1/04(H5N1)) hemagglutinin gene, complete cds.
gi|50083246|gb|AY646175|/Leopard/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/leopard/Suphanburi/Thailand/Leo-1/04(H5N1)) hemagglutinin gene, complete cds.
gi|50261904|gb|AY646242|/Swine/4(HA)/H5N1/China/2003/// Influenza virus A (A/swine/Shandong/2/03(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|55793690|gb|AY649382|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Thailand/CH-2/2004(H5N1)) hemagglutinin gene, complete cds.
gi|50296024|gb|AY651320|/Avian/4(HA)/H5N1/Indonesia/2003/// Influenza A virus (A/Ck/Indonesia/PA/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296026|gb|AY651321|/Avian/4(HA)/H5N1/Indonesia/2003/// Influenza A virus (A/Ck/Indonesia/BL/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296028|gb|AY651322|/Avian/4(HA)/H5N1/Indonesia/2004/// Influenza A virus (A/Dk/Indonesia/MS/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296030|gb|AY651323|/Avian/4(HA)/H5N1/Indonesia/2003/// Influenza A virus (A/Ck/Indonesia/2A/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296032|gb|AY651324|/Avian/4(HA)/H5N1/Indonesia/2004/// Influenza A virus (A/Ck/Indonesia/4/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296034|gb|AY651325|/Avian/4(HA)/H5N1/Indonesia/2004/// Influenza A virus (A/Ck/Indonesia/5/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296036|gb|AY651326|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Ck/Thailand/1/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|21359659|gb|AF468837|/Avian/4(HA)/H5N1/China/2001/// Influenza A virus (A/Duck/Anyang/AVL-1/2001(H5N1)) hemagglutinin H5 (H5) gene, complete cds.
gi|28849352|gb|AF509016|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/FY77/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849354|gb|AF509017|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/YU562/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849356|gb|AF509018|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/YU563/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849358|gb|AF509019|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/FY150/01 (H5N1)) hemagglutinin (HA) gene, partial cds.

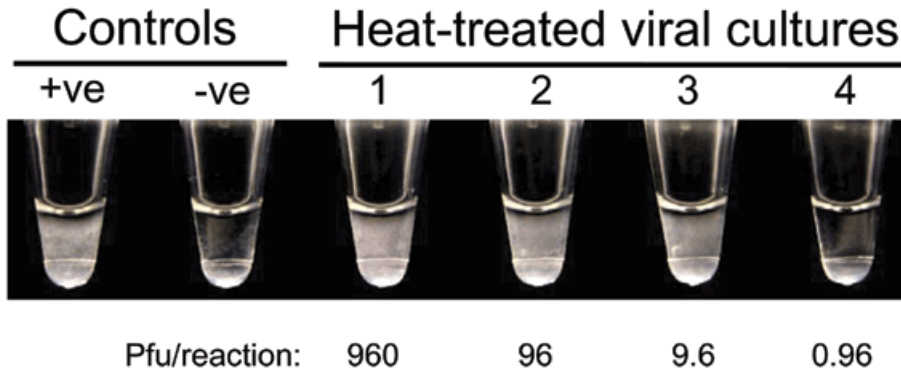
gi|28849360|gb|AF509020|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Pheasant/Hong Kong/FY155/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849362|gb|AF509021|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Silky Chicken/Hong Kong/SF189/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849364|gb|AF509022|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Quail/Hong Kong/SF203/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849366|gb|AF509023|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Pigeon/Hong Kong/SF215/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849368|gb|AF509024|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/SF219/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849370|gb|AF509025|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/715.5/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849372|gb|AF509026|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/822.1/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849374|gb|AF509027|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/829.2/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849376|gb|AF509028|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/830.2/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849378|gb|AF509029|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/858.3/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849380|gb|AF509030|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/867.1/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849382|gb|AF509031|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/879.1/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849384|gb|AF509032|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/873.3/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849386|gb|AF509033|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/876.1/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849388|gb|AF509034|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/891.1/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849390|gb|AF509035|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Chicken/Hong Kong/893.2/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849392|gb|AF509036|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Goose/Hong Kong/76.1/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849394|gb|AF509037|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Goose/Hong Kong/ww100/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849396|gb|AF509038|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Duck/Hong Kong/573.4/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|28849398|gb|AF509039|/Avian/4(HA)/H5N1/Hong Kong/2001/// Influenza A virus (A/Duck/Hong Kong/646.3/01 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296038|gb|AY651327|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Ck/Thailand/73/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296040|gb|AY651328|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Ck/Thailand/9.1/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296042|gb|AY651329|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Ck/Thailand/57/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296044|gb|AY651330|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/bird/Thailand/3.1/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296046|gb|AY651331|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Dk/Thailand/71.1/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296048|gb|AY651332|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Gs/Thailand/79/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797151|gb|DQ320884|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Guangxi/1378/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296054|gb|AY651335|/Human/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Viet Nam/3046/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296056|gb|AY651336|/Human/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Viet Nam/3062/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296058|gb|AY651337|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Ck/Viet Nam/33/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296060|gb|AY651338|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Ck/Viet Nam/35/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296062|gb|AY651339|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Ck/Viet Nam/36/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296064|gb|AY651340|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Ck/Viet Nam/37/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296066|gb|AY651341|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Ck/Viet Nam/38/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296068|gb|AY651342|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Ck/Viet Nam/39/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|50296070|gb|AY651343|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Ck/Viet Nam/C57/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797173|gb|DQ320895|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Guangxi/2461/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797175|gb|DQ320896|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/goose/Guangxi/345/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797177|gb|DQ320897|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/quail/Guangxi/575/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797179|gb|DQ320898|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/chicken/Guangxi/604/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797181|gb|DQ320899|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Guangxi/793/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|67649668|gb|DQ080022|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Henan/01/2004(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|71277596|gb|DQ083550|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Suphanburi/Thailand/CU-1/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277598|gb|DQ083551|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Bangkok/Thailand/CU-3/04(H5N1)) hemagglutinin gene, complete cds.
gi|71277600|gb|DQ083552|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/crow/Bangkok/Thailand/CU-4/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277602|gb|DQ083553|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/duck/Chonburi/Thailand/CU-5/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277604|gb|DQ083554|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Bangkok/Thailand/CU-6/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277606|gb|DQ083555|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Chonburi/Thailand/CU-7/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277608|gb|DQ083556|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Prachinburi/Thailand/CU-8/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277610|gb|DQ083557|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Suphanburi/Thailand/CU-9/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277612|gb|DQ083558|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Chachoengsao/Thailand/CU-10/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277614|gb|DQ083559|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Chachoengsao/Thailand/CU-11/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277616|gb|DQ083560|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Nakhon Sawan/Thailand/CU-12/04(H5N1)) hemagglutinin gene, partial cds.
gi|84797207|gb|DQ320912|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Hunan/1608/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797209|gb|DQ320913|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Hunan/1652/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797211|gb|DQ320914|/Avian/4(HA)/H5N1/China/2003/// Influenza A virus (A/duck/Shantou/4610/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|71277624|gb|DQ083564|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/white peafowl/Bangkok/Thailand/CU-16/04(H5N1)) hemagglutinin gene, complete cds.
gi|71277626|gb|DQ083565|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Saraburi/Thailand/CU-17/04(H5N1)) hemagglutinin gene, complete cds.
gi|71277628|gb|DQ083566|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Kalji Pheasant/Bangkok/Thailand/CU-18/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277630|gb|DQ083567|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/Ostrich/Samut Prakan/Thailand/CU-19/04(H5N1)) hemagglutinin gene, partial cds.
gi|84797221|gb|DQ320919|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/migratory duck/Jiangxi/2136/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797223|gb|DQ320920|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/migratory duck/Jiangxi/2295/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797225|gb|DQ320921|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/migratory duck/Jiangxi/2300/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|71277638|gb|DQ083571|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/rollers/Bangkok/Thailand/CU-26/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277640|gb|DQ083572|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Saraburi/Thailand/CU-27/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277642|gb|DQ083573|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/white peafowl/Bangkok/Thailand/CU-29/04(H5N1)) hemagglutinin gene, complete cds.
gi|84797233|gb|DQ320925|/Avian/4(HA)/H5N1/Hong Kong/2005/// Influenza A virus (A/Chinese pond heron/Hong Kong/18/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|71277646|gb|DQ083575|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/crow/Bangkok/Thailand/CU-35/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277648|gb|DQ083576|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Lopburi/Thailand/CU-38/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277650|gb|DQ083577|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Nakhon Sawan/Thailand/CU-39/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277652|gb|DQ083578|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Ratchaburi/Thailand/CU-68/04(H5N1)) hemagglutinin gene, complete cds.
gi|71277654|gb|DQ083579|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/duck/Nakhon Pathom/Thailand/CU-71/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277656|gb|DQ083580|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Chonburi/Thailand/CU-73/04(H5N1)) hemagglutinin gene, partial cds.
gi|56119215|gb|AY720942|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/chicken/Viet Nam/DT-171/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|56119223|gb|AY720945|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/duck/Viet Nam/TG-007A/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|56119233|gb|AY720950|/Human/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Viet Nam/DN-33/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|71277664|gb|DQ083584|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/sparrow/Phang-Nga/Thailand/CU-203/04(H5N1)) hemagglutinin gene, complete cds.
gi|57924439|gb|AY724785|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/chicken/Viet Nam/DN-045/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|57924521|gb|AY724787|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/chicken/Viet Nam/VL-008/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|91984119|gb|DQ095613|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/Bar-headed Goose/Qinghai/68/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|70955423|gb|DQ095614|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/Great Black-headed Gull/Qinghai/2/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|70955425|gb|DQ095615|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/Bar-headed Goose/Qinghai/60/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|91984122|gb|DQ095616|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/Brown-headed Gull/Qinghai/3/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|85062766|gb|DQ334760|/Avian/4(HA)/H5N1/Thailand/2005/// Influenza A virus (A/chicken/Thailand/Kanchanaburi/CK-160/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|51628336|gb|AY728894|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/chicken/Viet Nam/HauGiang-617/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|57915979|gb|AY737289|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Guangdong/191/04(H5N1)) segment 4, complete sequence.
gi|70955431|gb|DQ095620|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/Bar-headed Goose/Qinghai/62/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|91984128|gb|DQ095621|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/Bar-headed Goose/Qinghai/12/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|56672736|gb|AY741213|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/blackbird/Hunan/1/2004(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|56672789|gb|AY741215|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/tree sparrow/Henan/1/2004(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|56672873|gb|AY741217|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/tree sparrow/Henan/2/2004(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|56672930|gb|AY741219|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/tree sparrow/Henan/3/2004(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|56673032|gb|AY741221|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/tree sparrow/Henan/4/2004(H5N1)) hemagglutinin (HA) gene, complete cds.

gi|54126496|gb|AY747609|/Swine/4(HA)/H5N1/China/2003/// Influenza A virus (A/swine/Fujian/1/2003(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|54126527|gb|AY747617|/Swine/4(HA)/H5N1/China/2001/// Influenza A virus (A/swine/Fujian/F1/2001(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|55233227|gb|AY770079|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Hubei/489/2004(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|54873457|gb|AY770991|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Ayutthaya/Thailand/CU-23/04(H5N1)) hemagglutinin gene, partial cds.
gi|70955447|gb|DQ095631|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/Duck/Hunan/191/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|55247881|gb|AY779050|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/chicken/Thailand/CU-21/2004(H5N1)) hemagglutinin gene, partial cds.
gi|72398642|gb|DQ099756|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/duck/Viet Nam/TG-007A/2004(H5N1)) segment 4 hemagglutinin (HA) gene, complete cds.
gi|58618439|gb|AY818136|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/chicken/Vietnam/C58/04(H5N1)) hemagglutinin HA gene, complete cds.
gi|58618441|gb|AY818137|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/duck/Vietnam/36/04(H5N1)) hemagglutinin HA gene, complete cds.
gi|56418513|gb|AY830774|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chick/Macheng/2004(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|56553497|gb|AY834279|/Tiger/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/tiger/Thailand/SPB-1(H5N1)) hemagglutinin gene, complete cds.
gi|56792949|gb|AY842935|/Tiger/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/tiger/Thailand/CU-T3/2004(H5N1)) hemagglutinin gene, partial cds.
gi|58374179|gb|AY854190|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Shandong/093/2004(H5N1)) segment 4, complete sequence.
gi|71068504|gb|DQ100557|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/great black-headed gull/Qinghai/1/2005(H5N1)) hemagglutinin gene, partial cds; and HA gene, partial sequence.
gi|58198724|gb|AY866475|/Tiger/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/tiger/Thailand/CU-T7/2004(H5N1)) hemagglutinin gene, complete cds.
gi|61698013|gb|AY950230|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Henan/01/2004(H5N1)) segment 4, complete sequence.
gi|61698015|gb|AY950231|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/Chicken/Henan/210/2004(H5N1)) segment 4, complete sequence.
gi|61698017|gb|AY950232|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/Chicken/Henan/12/2004(H5N1)) segment 4, complete sequence.
gi|61698019|gb|AY950233|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/Chicken/Henan/13/2004(H5N1)) segment 4, complete sequence.
gi|61698021|gb|AY950234|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/Chicken/Henan/16/2004(H5N1)) segment 4, complete sequence.
gi|61698023|gb|AY950235|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/WildDuck/Guangdong/314/2004(H5N1)) segment 4, complete sequence.
gi|61698025|gb|AY950236|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/swan/Guangxi/307/2004(H5N1)) segment 4, complete sequence.
gi|62466138|gb|AY972539|/Tiger/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/tiger/Thailand/CU-T4/04(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|76786306|gb|DQ201829|/Avian/4(HA)/H5N1/China/2000/// Influenza A virus (A/Goose/Huadong/1/2000(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|76800613|gb|DQ211922|/Avian/4(HA)/H5N1/China/2003/// Influenza A virus (A/chicken/jiyuan/1/03(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|76800615|gb|DQ211923|/Avian/4(HA)/H5N1/China/2002/// Influenza A virus (A/chicken/zhengzhou/1/02(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|76800617|gb|DQ211924|/Avian/4(HA)/H5N1/China/2002/// Influenza A virus (A/chicken/zhoukou/2/02(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|110613481|gb|DQ840533|/Avian/4(HA)/H5N1/Russia/2005/// Influenza A virus (A/swan/Astrakhan/Russia/Nov-2/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|90654261|gb|DQ458992|/Avian/4(HA)/H5N1/Germany/2006/// Influenza A virus (A/mallard/Bavaria/1/2006(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|78450309|gb|DQ230521|/Avian/4(HA)/H5N1/Russia/2005/// Influenza A virus (A/grebe/Novosibirsk/29/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|78450348|gb|DQ230522|/Avian/4(HA)/H5N1/Russia/2005/// Influenza A virus (A/duck/Novosibirsk/56/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|78146041|gb|DQ231240|/Avian/4(HA)/H5N1/Russia/2005/// Influenza A virus (A/turkey/Suzdalka/Nov-01/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008236|gb|DQ497644|/Avian/4(HA)/H5N1/Indonesia/2004/// Influenza A virus (A/chicken/Ngawi/BPPV4/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008318|gb|DQ497685|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/duck/Vietnam/220/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|78458570|gb|DQ236077|/Cat/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/cat/Thailand/KU-02/04(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|78458879|gb|DQ236085|/Avian/4(HA)/H5N1/Thailand/2004/// Influenza A virus (A/pigeon/Thailand/KU-03/04(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|93008244|gb|DQ497648|/Avian/4(HA)/H5N1/Indonesia/2005/// Influenza A virus (A/chicken/Purworejo/BBVW/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008246|gb|DQ497649|/Avian/4(HA)/H5N1/Indonesia/2004/// Influenza A virus (A/qaail/Yogjakarta/BBVet-IX/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008248|gb|DQ497650|/Avian/4(HA)/H5N1/Indonesia/2004/// Influenza A virus (A/chicken/Kulon Progo/BBVet-XII-2/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008250|gb|DQ497651|/Avian/4(HA)/H5N1/Indonesia/2005/// Influenza A virus (A/chicken/Gunung Kidul/BBVW/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008252|gb|DQ497652|/Avian/4(HA)/H5N1/Indonesia/2005/// Influenza A virus (A/chicken/Kulon Progo/BBVW/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|82621197|gb|DQ279301|/Avian/4(HA)/H5N1/Russia/2005/// Influenza A virus (A/chicken/Tula/10/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84627165|gb|DQ320137|/Avian/4(HA)/H5N1/Russia/2005/// Influenza A virus (A/swan/Astrakhan/1/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797133|gb|DQ320875|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Fujian/897/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797135|gb|DQ320876|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/chicken/Fujian/1042/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797137|gb|DQ320877|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Guangxi/351/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797139|gb|DQ320878|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Guangxi/380/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797141|gb|DQ320879|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Guangxi/668/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797143|gb|DQ320880|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/goose/Guangxi/914/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797145|gb|DQ320881|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/goose/Guangxi/1097/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797147|gb|DQ320882|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/goose/Guangxi/1198/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797149|gb|DQ320883|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Guangxi/1311/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008276|gb|DQ497664|/Avian/4(HA)/H5N1/Indonesia/2004/// Influenza A virus (A/turkey/Kedaton/BPPV3/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797153|gb|DQ320885|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Guangxi/1586/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797155|gb|DQ320886|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Guangxi/1681/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797157|gb|DQ320887|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Guangxi/1793/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797159|gb|DQ320888|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/goose/Guangxi/1832/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797161|gb|DQ320889|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/goose/Guangxi/2112/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797163|gb|DQ320890|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Guangxi/2291/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797165|gb|DQ320891|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/goose/Guangxi/2383/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797167|gb|DQ320892|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/duck/Guangxi/2396/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797169|gb|DQ320893|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Guangxi/2439/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797171|gb|DQ320894|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Guangxi/2448/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008298|gb|DQ497675|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/mallard/Vietnam/347/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008300|gb|DQ497676|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/chicken/Vietnam/348/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008302|gb|DQ497677|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/mallard/Vietnam/352/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008304|gb|DQ497678|/Avian/4(HA)/H5N1/Viet Nam/2003/// Influenza A virus (A/chicken/Vietnam/19/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008306|gb|DQ497679|/Avian/4(HA)/H5N1/Viet Nam/2003/// Influenza A virus (A/chicken/Vietnam/20/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797183|gb|DQ320900|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Guangxi/951/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797185|gb|DQ320901|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Guangxi/20/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797187|gb|DQ320902|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Hunan/127/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797189|gb|DQ320903|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Hunan/139/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797191|gb|DQ320904|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Hunan/149/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797193|gb|DQ320905|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Hunan/152/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797195|gb|DQ320906|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Hunan/157/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797197|gb|DQ320907|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Hunan/160/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797199|gb|DQ320908|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Hunan/166/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797201|gb|DQ320909|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Hunan/182/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797203|gb|DQ320910|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/chicken/Hunan/999/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797205|gb|DQ320911|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/duck/Hunan/1265/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008332|gb|DQ497692|/Avian/4(HA)/H5N1/Viet Nam/2003/// Influenza A virus (A/chicken/Vietnam/5/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008334|gb|DQ497693|/Avian/4(HA)/H5N1/Viet Nam/2003/// Influenza A virus (A/chicken/Vietnam/8/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008336|gb|DQ497694|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/duck/Vietnam/S640/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797213|gb|DQ320915|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/goose/Shantou/2216/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797215|gb|DQ320916|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/migratory duck/Jiangxi/1653/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797217|gb|DQ320917|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/migratory duck/Jiangxi/1657/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797219|gb|DQ320918|/Avian/4(HA)/H5N1/China/2005/// Influenza A virus (A/migratory duck/Jiangxi/1701/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|86753761|gb|DQ366330|/Avian/4(HA)/H5N1/China/2004/// Influenza A virus (A/chicken/Guangxi/12/2004(H5N1)) hemagglutinin mRNA, complete cds.
gi|93008348|gb|DQ497700|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/chicken/Vietnam/133/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008350|gb|DQ497701|/Avian/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/chicken/Vietnam/147/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797227|gb|DQ320922|/Environment/4(HA)/H5N1/China/2005/// Influenza A virus (A/Environment/Qinghai/31/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797229|gb|DQ320923|/Avian/4(HA)/H5N1/Hong Kong/2004/// Influenza A virus (A/grey heron/Hong Kong/728/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797231|gb|DQ320924|/Avian/4(HA)/H5N1/Hong Kong/2004/// Influenza A virus (A/grey heron/Hong Kong/837/2004(H5N1)) hemagglutinin (HA) gene, partial cds.

gi|93008358|gb|DQ497705|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/wild bird/Vietnam/434/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797235|gb|DQ320926|/Avian/4(HA)/H5N1/Hong Kong/2002// Influenza A virus (A/chicken/Hong Kong/3123.1/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797237|gb|DQ320927|/Avian/4(HA)/H5N1/Hong Kong/2002// Influenza A virus (A/chicken/Hong Kong/86.3/2002(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797239|gb|DQ320928|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/chicken/Salatiga/BB Vet-1/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797241|gb|DQ320929|/Avian/4(HA)/H5N1/Indonesia/2003// Influenza A virus (A/chicken/Wonosobo/BPPV4/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797243|gb|DQ320930|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Yogyakarta/BBVet-IX/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797245|gb|DQ320931|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Kulon Progo/BBVet-XII-1/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|71277658|gb|DQ083581|/Avian/4(HA)/H5N1/Thailand/2004// Influenza A virus (A/duck/Saraburi/Thailand/CU-74/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277660|gb|DQ083582|/Avian/4(HA)/H5N1/Thailand/2004// Influenza A virus (A/chicken/Prachinburi/Thailand/CU-104/04(H5N1)) hemagglutinin gene, partial cds.
gi|71277662|gb|DQ083583|/Avian/4(HA)/H5N1/Thailand/2004// Influenza A virus (A/pigeon/Samut Prakan/Thailand/CU-202/04(H5N1)) hemagglutinin gene, complete cds.
gi|84797253|gb|DQ320935|/Avian/4(HA)/H5N1/Malaysia/2004// Influenza A virus (A/quail/Malaysia/6309/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|71277666|gb|DQ083585|/Avian/4(HA)/H5N1/Thailand/2004// Influenza A virus (A/Mynas/Ranong/Thailand/CU-209/04(H5N1)) hemagglutinin gene, complete cds.
gi|91984117|gb|DQ095612|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Bar-headed Goose/Qinghai/59/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797259|gb|DQ320938|/Avian/4(HA)/H5N1/Viet Nam/2003// Influenza A virus (A/chicken/Vietnam/27/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797261|gb|DQ320939|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/duck/Vietnam/568/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797263|gb|DQ320940|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/Mallard duck/Vietnam/133/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|83940767|gb|DQ323672|/Avian/4(HA)/H5N1/Russia/2005// Influenza A virus (A/chicken/Kurgan/3/2005(H5N1)) hemagglutinin precursor (HA) gene, complete cds.
gi|93008392|gb|DQ497722|/Human/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/Vietnam/CL20/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|91984126|gb|DQ095618|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Bar-headed Goose/Qinghai/61/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|70955429|gb|DQ095619|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Bar-headed Goose/Qinghai/75/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|85372720|gb|DQ340848|/Avian/4(HA)/H5N1/Ukraine/2005// Influenza A virus (A/chicken/Crimea/1/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008400|gb|DQ497726|/Human/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/Vietnam/CL105/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|70955434|gb|DQ095622|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Bar-headed Goose/Qinghai/65/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|70955436|gb|DQ095623|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Bar-headed Goose/Qinghai/67/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|91984130|gb|DQ095624|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Chicken/Yunnan/447/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|91984132|gb|DQ095625|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Chicken/Yunnan/493/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|70955440|gb|DQ095626|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Chicken/Shantou/810/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|87204335|gb|DQ363918|/Avian/4(HA)/H5N1/Russia/2005// Influenza A virus (A/Cygnus olor/Astrakhan/Ast05-2-4/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|70955443|gb|DQ095628|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Goose/Shantou/1621/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|91984137|gb|DQ095629|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Duck/Fujian/1734/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|70955445|gb|DQ095630|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Duck/Human/114/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|86753755|gb|DQ366306|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/duck/Vietnam/1/2005(H5N1)) hemagglutinin mRNA, complete cds.
gi|72398640|gb|DQ099755|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Viet Nam/TN-025/2004(H5N1)) segment 4 hemagglutinin (HA) gene, complete cds.
gi|86753759|gb|DQ366322|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/duck/Vietnam/8/05(H5N1)) hemagglutinin mRNA, complete cds.
gi|72398644|gb|DQ099757|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/quail/Viet Nam/TG-007B/2004(H5N1)) segment 4 hemagglutinin (HA) gene, complete cds.
gi|72398646|gb|DQ099758|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Viet Nam/TG-023/2004(H5N1)) segment 4 hemagglutinin (HA) gene, complete cds.
gi|72398648|gb|DQ099759|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Viet Nam/DT-171/2004(H5N1)) segment 4 hemagglutinin (HA) gene, complete cds.
gi|72398650|gb|DQ099760|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Viet Nam/LD-080/2004(H5N1)) segment 4 hemagglutinin (HA) gene, complete cds.
gi|71025271|gb|DQ100554|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/black-headed goose/Qinghai/1/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|71025273|gb|DQ100555|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/black-headed goose/Qinghai/2/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|71025275|gb|DQ100556|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/black-headed gull/Qinghai/1/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|89077643|gb|DQ399504|/Avian/4(HA)/H5N1/Russia/2005/11// Influenza A virus (A/Cygnus olor/Astrakhan/Ast05-2-8/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|75911269|gb|DQ137873|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/bar-headed goose/Qinghai/0510/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|88604738|gb|DQ406728|/Avian/4(HA)/H5N1/Nigeria/2006/01/17// Influenza A virus (A/chicken/Nigeria/641/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|89475499|gb|DQ407519|/Avian/4(HA)/H5N1/Turkey/2005// Influenza A virus (A/turkey/Turkey/1/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|77378033|gb|DQ182483|/Avian/4(HA)/H5N1/Belgium/2004// Influenza A virus (A/crested eagle/Belgium/01/2004(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|89258382|gb|DQ434889|/Avian/4(HA)/H5N1/Russia/2005/11/26// Influenza A virus (A/Cygnus olor/Astrakhan/Ast05-2-10/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|89275862|gb|DQ435200|/Cat/4(HA)/H5N1/Iraq/2006// Influenza A virus (A/domestic cat/Iraq/820/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|89275864|gb|DQ435201|/Avian/4(HA)/H5N1/Iraq/2006// Influenza A virus (A/domestic goose/Iraq/812/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|89275866|gb|DQ435202|/Human/4(HA)/H5N1/Iraq/2006// Influenza A virus (A/human/Iraq/207-NAMRU3/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|89477112|gb|DQ440535|/Avian/4(HA)/H5N1/Iran/2006/02// Influenza A virus (A/Cygnus cygnus/Iran/754/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|90025360|gb|DQ447199|/Avian/4(HA)/H5N1/Egypt/2006// Influenza A virus (A/chicken/Egypt/960N3-004/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|89994020|gb|DQ449031|/Avian/4(HA)/H5N1/Italy/2006/02// Influenza A virus (A/mallard/Italy/835/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|90289625|gb|DQ449632|/Avian/4(HA)/H5N1/Russia/2005// Influenza A virus (A/chicken/Kurgan/05/2005(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|90289674|gb|DQ449640|/Avian/4(HA)/H5N1/Russia/2005// Influenza A virus (A/duck/Kurgan/08/2005(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|21326684|gb|AY075033|/Avian/4(HA)/H5N1/Hong Kong/2001// Influenza A virus (A/duck/Hong Kong/380.5/2001(H5N1)) hemagglutinin H5 (H5) gene, complete cds.
gi|110552220|gb|DQ852600|/Avian/4(HA)/H5N1/Russia/2006/06/24// Influenza A virus (A/grebe/Tyva/Tyv06-2/06(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|90823033|gb|DQ464377|/Human/4(HA)/H5N1/Egypt/2006// Influenza A virus (A/Egypt/2782-NAMRU3/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008232|gb|DQ497642|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Malang/BBVet-IV/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008234|gb|DQ497643|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/chicken/Magetan/BBVW/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008316|gb|DQ497684|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/duck/Vietnam/219/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|110631388|gb|DQ862002|/Avian/4(HA)/H5N1/Egypt/2006/06// Influenza A virus (A/duck/Egypt/2253-3/2006(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|93008240|gb|DQ497646|/Avian/4(HA)/H5N1/Indonesia/2003// Influenza A virus (A/chicken/Sragen/BPPV4/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008242|gb|DQ497647|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/quail/Boyolali/BPPV4/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008324|gb|DQ497688|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/duck/Vietnam/N-TB/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008326|gb|DQ497689|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/duck/Vietnam/317/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008328|gb|DQ497690|/Avian/4(HA)/H5N1/Viet Nam/2003// Influenza A virus (A/mallard/Vietnam/3/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008330|gb|DQ497691|/Avian/4(HA)/H5N1/Viet Nam/2003// Influenza A virus (A/chicken/Vietnam/4/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|109727317|gb|DQ666146|/Human/4(HA)/H5N1/Djibouti/2006// Influenza A virus (A/Djibouti/5691NAMRU3/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008254|gb|DQ497653|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Purwakarta/BBVet-IV/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008256|gb|DQ497654|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/quail/Tasikmalaya/BPPV4/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008258|gb|DQ497655|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Bangli Bali/BPPV6-1/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008260|gb|DQ497656|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Bangli Bali/BPPV6-2/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008262|gb|DQ497657|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Jembrana/BPPV6/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008344|gb|DQ497698|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Vietnam/52/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008266|gb|DQ497659|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/duck/Parepare/BBVM/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008268|gb|DQ497660|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Kupang-2-NTT/BPPV6/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008270|gb|DQ497661|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Kupang-3-NTT/BPPV6/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008272|gb|DQ497662|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Kupang-1-NTT/BPPV6/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008274|gb|DQ497663|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Pangkalpinang/BPPV3/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008356|gb|DQ497704|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/duck/Vietnam/376/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008278|gb|DQ497665|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/chicken/Simalanggang/BPPVI/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008280|gb|DQ497666|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/chicken/Tebing Tinggi/BPPVI/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008282|gb|DQ497667|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/chicken/Dairi/BPPVI/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008284|gb|DQ497668|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/chicken/Deli Serdang/BPPVI/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008286|gb|DQ497669|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/chicken/Tarutung/BPPVI/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008288|gb|DQ497670|/Avian/4(HA)/H5N1/Viet Nam/2003// Influenza A virus (A/duck/Vietnam/15/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008290|gb|DQ497671|/Avian/4(HA)/H5N1/Viet Nam/2003// Influenza A virus (A/mallard/Vietnam/16/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008292|gb|DQ497672|/Avian/4(HA)/H5N1/Viet Nam/2003// Influenza A virus (A/duck/Vietnam/17/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008294|gb|DQ497673|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/duck/Vietnam/40/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008296|gb|DQ497674|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/duck/Vietnam/272/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008378|gb|DQ497715|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/quail/Vietnam/177/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797255|gb|DQ320936|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/duck/Vietnam/S654/2005(H5N1)) hemagglutinin (HA) gene, partial cds.

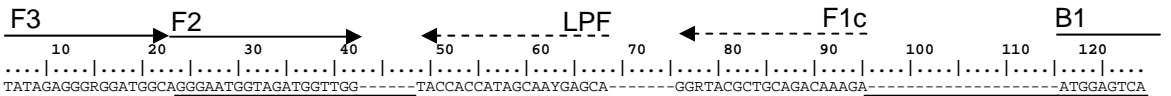
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gi|93008384|gb|DQ497718|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Vietnam/132/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008386|gb|DQ497719|/Human/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/Vietnam/CL01/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008308|gb|DQ497680|/Avian/4(HA)/H5N1/Viet Nam/2003// Influenza A virus (A/mallard/Vietnam/21/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008310|gb|DQ497681|/Avian/4(HA)/H5N1/Viet Nam/2003// Influenza A virus (A/chicken/Vietnam/28/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008312|gb|DQ497682|/Avian/4(HA)/H5N1/Viet Nam/2003// Influenza A virus (A/chicken/Vietnam/30/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008314|gb|DQ497683|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/duck/Vietnam/48/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|85062798|gb|DQ334776|/Avian/4(HA)/H5N1/Thailand/2005// Influenza A virus (A/chicken/Thailand/Nontaburi/CK-162/2005(H5N1)) hemagglutinin gene, complete cds.
gi|93008398|gb|DQ497725|/Human/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/Vietnam/CL100/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008320|gb|DQ497686|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/duck/Vietnam/N-XX/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008322|gb|DQ497687|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Vietnam/32/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|85062568|gb|DQ343152|/Avian/4(HA)/H5N1/China/2002// Influenza A virus (A/chicken/Hebei/108/02(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|85376991|gb|DQ343502|/Avian/4(HA)/H5N1/Russia/2005/11/26// Influenza A virus (A/Cygnus olor/Astrakhan/Ast05-2-2/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|95116642|gb|DQ515984|/Avian/4(HA)/H5N1/Czech Republic/2006/03// Influenza A virus (A/Cygnus olor/Czech Republic/5170/2006 (H5N1)) hemagglutinin gene, complete cds.
gi|86211366|gb|DQ358746|/Avian/4(HA)/H5N1/Russia/2005/11/26// Influenza A virus (A/Cygnus olor/Astrakhan/Ast05-2-3/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|110273419|gb|DQ838516|/Avian/4(HA)/H5N1/Niger/2006/05// Influenza A virus (A/chicken/Niger/2130-8/2006(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|108782501|gb|DQ644955|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Denpasar/01/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|108782503|gb|DQ644956|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/chicken/Denpasar/02/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008338|gb|DQ497695|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Vietnam/135/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008340|gb|DQ497696|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Vietnam/149/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008342|gb|DQ497697|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/duck/Vietnam/286/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|109692765|gb|DQ650659|/Avian/4(HA)/H5N1/Ukraine/2005// Influenza A virus (A/chicken/Crimea/04/2005(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|109692773|gb|DQ650663|/Avian/4(HA)/H5N1/Ukraine/2005// Influenza A virus (A/chicken/Crimea/08/2005(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|105914725|gb|DQ659113|/Avian/4(HA)/H5N1/Niger/2006/02// Influenza A virus (A/duck/Niger/914/2006(H5N1)) hemagglutinin (HA), partial cds.
gi|87137936|gb|DQ371928|/Human/4(HA)/H5N1/China/2005// Influenza A virus (A/Anhui/1/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|93008352|gb|DQ497702|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/duck/Vietnam/148/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008354|gb|DQ497703|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/chicken/Vietnam/398/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|107785189|gb|DQ661910|/Avian/4(HA)/H5N1/Afghanistan/2006/03// Influenza A virus (A/chicken/Afghanistan/1207/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|88714395|gb|DQ389158|/Avian/4(HA)/H5N1/Russia/2005// Influenza A virus (A/Cygnus olor/Astrakhan/Ast05-2-1/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|93008360|gb|DQ497706|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Vietnam/260/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008362|gb|DQ497707|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/goose/Vietnam/264/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008364|gb|DQ497708|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/duck/Vietnam/283/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008366|gb|DQ497709|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/duck/Vietnam/557/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008368|gb|DQ497710|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Vietnam/53/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008370|gb|DQ497711|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/quail/Vietnam/282/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797247|gb|DQ320932|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/chicken/Bantul/BBVet-1/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797249|gb|DQ320933|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/chicken/Wajo/BBVM/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|84797251|gb|DQ320934|/Avian/4(HA)/H5N1/Malaysia/2004// Influenza A virus (A/chicken/Malaysia/5858/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|47834887|gb|AY575879|/Avian/4(HA)/H5N1/Hong Kong/2002// Influenza A virus (A/Ck/HK/409.1/02 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|47834885|gb|AY575878|/Avian/4(HA)/H5N1/Hong Kong/2002// Influenza A virus (A/Ck/HK/96.1/02 (H5N1)) hemagglutinin (HA) gene, partial cds.
gi|85062564|gb|DQ343150|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/chicken/Hebei/326/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|98418223|gb|DQ301713|/Canine/4(HA)/H5N1/Thailand/2004// Influenza A virus (A/dog/Thailand-Suphanburi/KU-08/04(H5N1)) hemagglutinin gene, partial cds.
gi|110613449|gb|DQ840519|/Avian/4(HA)/H5N1/Russia/2005// Influenza A virus (A/chicken/Tula/Russia/Oct-5/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008388|gb|DQ497720|/Human/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/Vietnam/CL02/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008390|gb|DQ497721|/Human/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/Vietnam/CL17/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|110631382|gb|DQ861999|/Avian/4(HA)/H5N1/Sudan/2006/05// Influenza A virus (A/chicken/Sudan/2115-12/2006(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|85062782|gb|DQ334768|/Avian/4(HA)/H5N1/Thailand/2005// Influenza A virus (A/quail/Thailand/Nakhon Pathom/QA-161/2005(H5N1)) hemagglutinin gene, complete cds.
gi|4240447|gb|AF082040|/Avian/4(HA)/H5N1/USA/1983// Influenza A virus (A/duck/Minnesota/1525/81(H5N1)) hemagglutinin H5 mRNA, partial cds.
gi|93008396|gb|DQ497724|/Human/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/CL36/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008238|gb|DQ497645|/Avian/4(HA)/H5N1/Indonesia/2003// Influenza A virus (A/chicken/Pekalongan/BPPV4/2003(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|85062566|gb|DQ343151|/Avian/4(HA)/H5N1/China/2001// Influenza A virus (A/chicken/Hebei/718/2001(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|93008402|gb|DQ497727|/Human/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/Vietnam/CL115/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008404|gb|DQ497728|/Human/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/Vietnam/CL119/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008406|gb|DQ497729|/Human/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/Vietnam/CL2009/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|60482|gb|X07869|/Avian/4(HA)/H5N1/United Kingdom/1959// Influenza A virus (A/chicken/Scotland/59(H5N1)) mRNA for hemagglutinin precursor
gi|110273421|gb|DQ838517|/Avian/4(HA)/H5N1/Niger/2006/05// Influenza A virus (A/chicken/Niger/2130-7/2006(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|87204345|gb|DQ363923|/Avian/4(HA)/H5N1/Russia/2005// Influenza A virus (A/Cygnus olor/Astrakhan/Ast05-2-7/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|86278718|gb|DQ364996|/Avian/4(HA)/H5N1/Russia/2005/11/26// Influenza A virus (A/Cygnus olor/Astrakhan/Ast05-2-6/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|86278736|gb|DQ365004|/Avian/4(HA)/H5N1/Russia/2005/11/26// Influenza A virus (A/Cygnus olor/Astrakhan/Ast05-2-5/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|108782507|gb|DQ644958|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/duck/Buleleg-Bali/04/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|86753757|gb|DQ366314|/Avian/4(HA)/H5N1/Viet Nam/2005// Influenza A virus (A/goose/Vietnam/3/05(H5N1)) hemagglutinin mRNA, complete cds.
gi|110631386|gb|DQ862001|/Avian/4(HA)/H5N1/Egypt/2006/06// Influenza A virus (A/chicken/Magdy/2253-1/2006(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|93008264|gb|DQ497658|/Avian/4(HA)/H5N1/Indonesia/2004// Influenza A virus (A/chicken/Mangarai-NTT/BPPV6/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|110333722|gb|DQ837587|/Avian/4(HA)/H5N1/Egypt/2006// Influenza A virus (A/Chicken/Egypt/5610NAMRU3-F3/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|110333724|gb|DQ837588|/Avian/4(HA)/H5N1/Egypt/2006// Influenza A virus (A/Chicken/Egypt/5611NAMRU3-AN/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|87137938|gb|DQ371929|/Human/4(HA)/H5N1/China/2005// Influenza A virus (A/Anhui/2/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|87137940|gb|DQ371930|/Human/4(HA)/H5N1/China/2005// Influenza A virus (A/Guangxi/1/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|87042573|gb|DQ372591|/Human/4(HA)/H5N1/Thailand/2005// Influenza A virus (A/Thailand/NK165/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|110084604|gb|DQ659679|/Avian/4(HA)/H5N1/Germany/2006// Influenza A virus (A/common bussard/Bavaria/2/2006(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|109636638|gb|DQ767725|/Avian/4(HA)/H5N1/China/2004// Influenza A virus (A/chicken/Shandong/K01/2004(H5N1)) segment 4, complete sequence.
gi|89077659|gb|DQ399547|/Avian/4(HA)/H5N1/Russia/2005/11// Influenza A virus (A/Cygnus olor/Astrakhan/Ast05-2-9/2005(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|110273403|gb|DQ838508|/Avian/4(HA)/H5N1/Italy/2005// Influenza A virus (A/mallard/Italy/3401/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|110333726|gb|DQ837589|/Avian/4(HA)/H5N1/Egypt/2006// Influenza A virus (A/Chicken/Egypt/5612NAMRU3-S/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|94961242|gb|DQ412997|/Avian/4(HA)/H5N1/Italy/2006/02/10// Influenza A virus (A/Cygnus olor/Italy/742/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|91984134|gb|DQ095627|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (A/Quail/Shantou/911/05(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|101918580|gb|AB259712|/Avian/4(HA)/H5N1/Japan/2004// Influenza A virus (A/duck/Hokkaido/Vac-1/04(H5N1)) genomic RNA, segment 4, complete sequence.
gi|47156278|gb|AY585362|/Avian/4(HA)/H5N1/China/2002// Influenza A virus (A/duck/Guangdong/22/2002(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|109452300|gb|AB263192|/Avian/4(HA)/H5N1/Mongolia/2001// Influenza A virus (A/R/duck/Mongolia/54/01-duck/Mongolia/47/01 (H5N1)) genomic RNA, segment 4, complete sequence.
gi|93008376|gb|DQ497714|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Vietnam/134/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|108671042|gb|DQ659326|/Avian/4(HA)/H5N1/Mongolia/2005// Influenza A virus (St Jude H5N1 influenza seed virus 163243) hemagglutinin (HA) gene, complete cds.
gi|93008380|gb|DQ497716|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/duck/Vietnam/258/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|86753763|gb|DQ366338|/Avian/4(HA)/H5N1/China/2004// Influenza A virus (A/duck/Guangxi/13/2004(H5N1)) hemagglutinin mRNA, complete cds.
gi|110333728|gb|DQ837590|/Avian/4(HA)/H5N1/Egypt/2006// Influenza A virus (A/Turkey/Egypt/5613NAMRU3-T/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|60702|gb|X07826|/Avian/4(HA)/H5N1/United Kingdom/1959// Influenza A virus (A/chicken/Scotland/59(H5N1)) HA gene for hemagglutinin, genomic RNA
gi|108782511|gb|DQ676830|/Avian/4(HA)/H5N1/Russia/2006// Influenza A virus (A/chicken/Mahachkala/05/2006(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|110287938|gb|DQ836043|/Avian/4(HA)/H5N1/China/2004// Influenza A virus (A/goose/Huadong/220/2004(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|4240453|gb|AF082043|/Avian/4(HA)/H5N1/USA/1983// Influenza A virus (A/gull/Pennsylvania/4175/83(H5N1)) hemagglutinin H5 mRNA, partial cds.
gi|93008394|gb|DQ497723|/Human/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/Vietnam/CL26/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|108782509|gb|DQ644959|/Avian/4(HA)/H5N1/Indonesia/2005// Influenza A virus (A/duck/Badung-Bali/05/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|108671044|gb|DQ659327|/Avian/4(HA)/H5N1/China/2005// Influenza A virus (St Jude H5N1 influenza seed virus 163222) hemagglutinin (HA) gene, complete cds.
gi|110631390|gb|DQ862003|/Avian/4(HA)/H5N1/Sudan/2006/05// Influenza A virus (A/chicken/Sudan/1784/2006(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008374|gb|DQ497713|/Avian/4(HA)/H5N1/Viet Nam/2004// Influenza A virus (A/chicken/Vietnam/159/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|47834879|gb|AY575875|/Avian/4(HA)/H5N1/Hong Kong/2002// Influenza A virus (A/Ck/HK/31.4/02 (H5N1)) hemagglutinin (HA) gene, partial cds.

gi|67107296|gb|F68489|/Avian/4(HA)/H5N1/United Kingdom/1991/// hemagglutinin [H5N1 avian influenza virus, A/turkey/England/50-92/91, Genomic, 1773 nt]
gi|108782519|gb|DQ676834|/Avian/4(HA)/H5N1/Russia/2006/// Influenza A virus (A/chicken/Krasnodar/01/2006(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|93008382|gb|DQ497717|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/duck/Vietnam/543/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|108782531|gb|DQ676840|/Avian/4(HA)/H5N1/Russia/2005/// Influenza A virus (A/goose/Krasnozerka/627/2005(H5N1)) hemagglutinin (HA) mRNA, complete cds.
gi|108782505|gb|DQ644957|/Avian/4(HA)/H5N1/Indonesia/2005/// Influenza A virus (A/duck/Jembrana-Bali/03/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|93008372|gb|DQ497712|/Avian/4(HA)/H5N1/Viet Nam/2005/// Influenza A virus (A/chicken/Vietnam/393/2005(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|110631384|gb|DQ862000|/Avian/4(HA)/H5N1/Sudan/2006/05/// Influenza A virus (A/chicken/Sudan/2115-9/2006(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|58618437|gb|AY818135|/Human/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Viet Nam/1203/2004(H5N1)) hemagglutinin HA gene, complete cds.
gi|50296052|gb|AY651334|/Human/4(HA)/H5N1/Viet Nam/2004/// Influenza A virus (A/Viet Nam/1203/2004(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|2865379|gb|AF028709|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/HongKong/156/97(H5N1)) hemagglutinin mRNA, complete cds.
gi|2833656|gb|AF036356|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/HongKong/156/97(H5N1)) H5 hemagglutinin (HA) gene, partial cds.
gi|3335402|gb|AF046080|/Avian/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Chicken/Hong Kong/220/97 (H5N1)) hemagglutinin subtype H5 (H5) gene, complete cds.
gi|3335420|gb|AF046088|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/156/97(H5N1)) hemagglutinin subtype H5 (H5) gene, complete cds.
gi|3421251|gb|AF046096|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/481/97(H5N1)) hemagglutinin subtype H5 (H5) gene, complete cds.
gi|3421255|gb|AF046097|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/483/97(H5N1)) hemagglutinin subtype H5 (H5) gene, complete cds.
gi|3421259|gb|AF046098|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/482/97(H5N1)) hemagglutinin subtype H5 (H5) gene, complete cds.
gi|3421263|gb|AF046099|/Avian/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Chicken/Hong Kong/728/97 (H5N1)) hemagglutinin subtype H5 (H5) gene, complete cds.
gi|3068720|gb|AF057291|/Avian/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/chicken/Hong Kong/258/97(H5N1)) hemagglutinin mRNA, complete cds.
gi|4240435|gb|AF082034|/Avian/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Chicken/Hong Kong/728/97 (H5N1)) hemagglutinin H5 mRNA, complete cds.
gi|4240437|gb|AF082035|/Avian/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Chicken/Hong Kong/786/97 (H5N1)) hemagglutinin H5 mRNA, complete cds.
gi|8307800|gb|AF084279|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/HongKong/481/97(H5N1)) segment 4 hemagglutinin (ha) gene, partial cds.
gi|8307802|gb|AF084280|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/HongKong/483/97(H5N1)) segment 4 hemagglutinin (ha) gene, partial cds.
gi|8307804|gb|AF084281|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/HongKong/486/97(H5N1)) segment 4 hemagglutinin (ha) gene, partial cds.
gi|5813856|gb|AF084532|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/HongKong/485/97(H5N1)) segment 4 hemagglutinin (HA) gene, partial cds.
gi|6048752|gb|AF098541|/Avian/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Chicken/Hong Kong/y385/97 (H5N1)) hemagglutinin gene, partial cds.
gi|6048754|gb|AF098542|/Avian/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Chicken/Hong Kong/y388/97 (H5N1)) hemagglutinin gene, partial cds.
gi|6048756|gb|AF098543|/Avian/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Duck/Hong Kong/p46/97 (H5N1)) hemagglutinin gene, partial cds.
gi|6048760|gb|AF098545|/Avian/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Goose/Hong Kong/w355/97 (H5N1)) hemagglutinin gene, partial cds.
gi|6048762|gb|AF098546|/Avian/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Silky Chicken/Hong Kong/p17/97 (H5N1)) hemagglutinin gene, partial cds.
gi|4457115|gb|AF102671|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/486/97(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|4457116|gb|AF102672|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/488/97(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|4457117|gb|AF102673|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/516/97(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|4457118|gb|AF102674|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/538/97(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|4457119|gb|AF102675|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/507/97(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|4457120|gb|AF102676|/Human/4(HA)/H5N1/Hong Kong/1998/// Influenza A virus (A/Hong Kong/97/98(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|4457121|gb|AF102677|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/491/97(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|4457122|gb|AF102678|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/542/97(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|4457123|gb|AF102679|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/503/97(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|4457124|gb|AF102680|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A Virus (A/Hong Kong/532/97(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|4457125|gb|AF102681|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/485/97(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|4457126|gb|AF102682|/Human/4(HA)/H5N1/Hong Kong/1997/// Influenza A virus (A/Hong Kong/514/97(H5N1)) hemagglutinin (HA) gene, partial cds.
gi|5805286|gb|AF144305|/Avian/4(HA)/H5N1/China/1996/// Influenza A virus (A/Goose/Guangdong/1/96(H5N1)) hemagglutinin (HA) gene, complete cds.
gi|5007022|gb|AF148678|/Avian/4(HA)/H5N1/China/1996/// Influenza A virus (A/goose/Guangdong/1/96(H5N1)) hemagglutinin mRNA, complete cds.



Appendix Figure 1. Visual inspection of the positivity of LAMP reactions. Heated, treated viral culture was serially diluted and tested by the LAMP assay. Reactions were visually inspected after the incubation. Positive reactions would produce large amounts of white magnesium pyrophosphate precipitate, thereby increasing the turbidity of these reactions (+ve control and samples 1 to 3). By contrast, negative reactions (-ve control and sample 4) remained transparent after the incubation. The amount of pfu used in the tested samples is indicated.

Appendix Figure 2 (next 2 pages). Target sites for the loop-mediated isothermal amplification (LAMP) assay. 1) Alignment of H1-16 sequences. Locations of the primer-binding regions are indicated by arrows (forward) and broken arrows (reverse). The first and last nucleotides are equivalent to the 1065th and 1298th nucleotides of A/Vietnam/1203/2004 (GenBank accession no. AY651334). Degenerate positions are shown in **boldface**. All the non-H5N1 sequences contain several mismatches to the primers used in the LAMP assay. Because of space constraints, 1 representative non-H5 hemagglutinin (HA) sequence from each HA subtype was selected; names are shown. 2) Sequence of primers F1P, B1P, F3, B3c, LPF, and LPB used in the LAMP assay. Degenerate positions and linker sequences are in **boldface** and underlined, respectively.



Target regions

gi	Accession	Region	Variant
gi	107785189 gb DQ661910	F3	
gi	108671042 gb DQ659326	F3	
gi	108782501 gb DQ644955	F3	T
gi	109692765 gb DQ650659	F3	
gi	109692773 gb DQ650663	F3	
gi	109941929 gb AM183669	F3	
gi	109941933 gb AM183671	F3	A
gi	110084604 gb DQ659679	F3	T
gi	110273419 gb DQ838516	F3	
gi	110319976 gb AM262543	F3	
gi	110333726 gb DQ837589	F3	
gi	110333728 gb DQ837590	F3	
gi	110613449 gb DQ840519	F3	
gi	110613481 gb DQ840533	F3	A
gi	110631384 gb DQ862000	F3	A
gi	110631388 gb DQ862002	F3	
gi	13676824 gb AF364334	F3	G
gi	18092165 gb AF398417	F3	
gi	19697773 gb AY059482	F3	
gi	28806384 gb AY221522	F3	
gi	28849352 gb AF509016	F3	
gi	4457119 gb AF102675	F3	/
gi	45934598 gb AY576927	F2	C C
gi	46318020 gb AY574187	F2	
gi	47156288 gb AY585367	F2	
gi	47156308 gb AY585377	F2	
gi	47834859 gb AY575869	F2	
gi	48431281 gb AY590568	F2	
gi	5007022 gb AF148678	F2	/ A
gi	50296026 gb AY651321	F2	
gi	50296028 gb AY651322	F2	
gi	50296038 gb AY651327	F2	
gi	50296050 gb AY651333	F2	
gi	50296096 gb AY651356	F2	A
gi	50296106 gb AY651361	F2	
gi	50296110 gb AY651363	F2	
gi	50296114 gb AY651365	F2	
gi	50296128 gb AY651372	F2	
gi	50296130 gb AY651373	F2	A
gi	50843949 gb AY679514	F2	C
gi	55247877 gb AY779048	F2	
gi	55247881 gb AY779050	F2	
gi	56119215 gb AY720942	F2	
gi	56548875 gb AY676035	F2	
gi	57915979 gb AY737289	F2	
gi	58198724 gb AY866475	F2	
gi	58531088 gb AB166862	F2	G
gi	58618441 gb AY818137	F2	
gi	66775624 gb DQ023145	F2	C
gi	67107296 gb S68489	F2	/ A C
gi	71013497 gb AB212054	F2	A
gi	71277596 gb DQ083550	F2	
gi	71277624 gb DQ083564	F2	
gi	71277632 gb DQ083568	F2	
gi	71277642 gb DQ083573	F2	
gi	76800613 gb DQ211922	F2	
gi	76800619 gb DQ211925	F2	
gi	77378033 gb DQ182483	F2	T
gi	78096575 gb AB239125	F2	A
gi	78210824 gb AB212649	F2	
gi	78450309 gb DQ230521	F2	
gi	81687118 gb AB233320	F2	G
gi	82621197 gb DQ279301	F2	
gi	84797133 gb DQ320875	F2	
gi	84797175 gb DQ320896	F2	
gi	84797213 gb DQ320915	F2	
gi	84797225 gb DQ320921	F2	
gi	84797227 gb DQ320922	F2	
gi	84797235 gb DQ320926	F2	
gi	84797245 gb DQ320931	F2	
gi	84797251 gb DQ320934	F2	
gi	84797253 gb DQ320935	F2	
gi	105914725 gb DQ659113	F2	
gi	84797259 gb DQ320938	F2	
gi	85062566 gb DQ343151	F2	
gi	85372720 gb DQ340848	F2	
gi	108782509 gb DQ644959	F2	
gi	86211366 gb DQ358746	F2	
gi	87204335 gb DQ363918	F2	A
gi	88604738 gb DQ406728	F2	T
gi	89275862 gb DQ435200	F2	
gi	89475499 gb DQ407519	F2	
gi	89477112 gb DQ440535	F2	G
gi	89994020 gb DQ449031	F2	
gi	90025360 gb DQ447199	F2	
gi	90654261 gb DQ458992	F2	
gi	91984119 gb DQ095613	F2	T
gi	91984124 gb DQ095617	F2	
gi	93008234 gb DQ497643	F2	
gi	93008240 gb DQ497646	F2	
gi	93008250 gb DQ497651	F2	
gi	93008260 gb DQ497656	F2	
gi	93008276 gb DQ497664	F2	
gi	93008314 gb DQ497683	F2	
gi	93008344 gb DQ497698	F2	
gi	93008368 gb DQ497710	F2	
gi	94961242 gb DQ412997	F2	
gi	95116642 gb DQ515984	F2	
gi	9863895 gb AF216721	F2	/
		F3	
		F1c	
		B1	

TATAGAGGGRGGATGCCAGGGAATGTTAGATGTTGG-----TACCACCATAGCAAYGAGCA-----GGRTACGCTGCAGACAAAGA-----ATGGAGTCA

