Towards a better understanding of the novel avian-origin H7N9 influenza A virus in China

Yongbo Wang^{1,†}, Zhangyan Dai^{2,†}, Han Cheng^{1,†}, Zexian Liu^{1,†}, Zhicheng Pan^{1,†}, Wankun Deng^{1,†}, Tianshun Gao^{1,†}, Xiaotong Li¹, Yuangen Yao¹, Jian Ren³, Yu Xue^{1,*}

¹Department of Biomedical Engineering, College of Life Science and Technology, Huazhong University of Science and Technology, Wuhan, Hubei 430074, China ²School of Chemistry and Molecular Biosciences, University of Queensland, Brisbane, Queensland 4027, Australia ³State Key Laboratory of Biocontrol, School of Life Sciences, Sun Yat-sen University, Guangzhou, Guangdong 510275, China

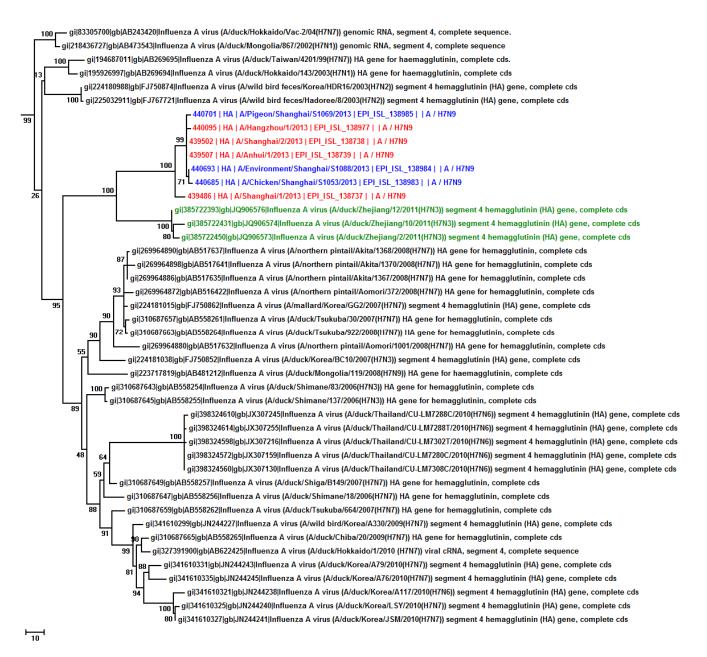
[†]These authors contributed equally to this work.

*Correspondence and requests for materials should be addressed to Yu Xue, Tel: +86-27-87793903, Fax: +86-27-87793172, E-mail: <u>xueyu@hust.edu.cn</u>.

Supplementary information

Supplementary Fig. S1 – Phylogenetic analyses of H7N9 virus genes. The detailed MP trees for (a) HA and (b) were presented, while the NJ trees were also constructed for (c) HA and (d) NA. The NJ trees were also shown for (e) PB1, (f) PB2, (g) PA, (h) NP, (i) M and (j) NS. The HPAI viruses in patients were marked in red, while HPAI viruses from non-human samples were marked in blue. The nearest genes from LPAI viruses were shown in green.

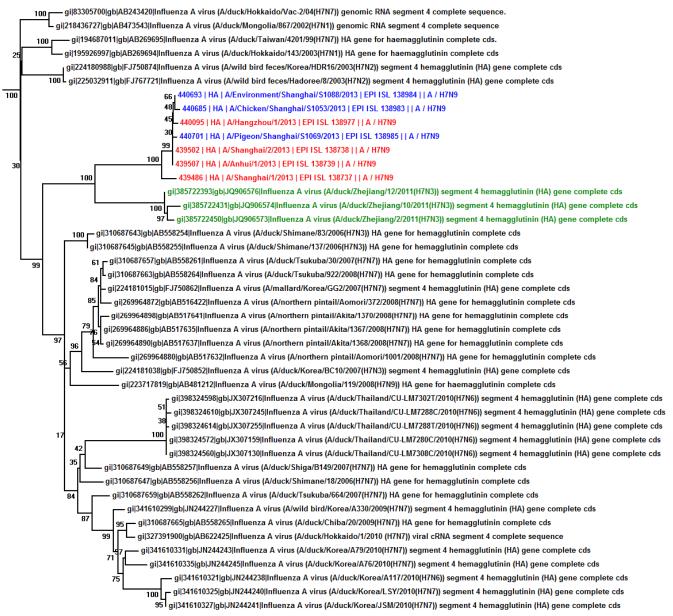
Supplementary Figure 1a



Supplementary Figure 1b

92 — gij223717821 gb AB481213 Influenza A virus (A/duck/Mongolia/119/2008(H7N9)) NA gene for neuraminidase, complete cds
gij380867068 gb CY109684 Influenza A virus (A/duck/Hunan/1590/2007(H6N9)) neuraminidase (NA) gene, complete cds
440700 NA A/Pigeon/Shanghai/S1069/2013 EPI_ISL_138985 A / H7N9
97 - 439500 NA A/Shanghai/2/2013 EPI_ISL_138738 A / H7N9
439509 NA A/Anhui/1/2013 EPI_ISL_138739 A / H7N9 85 440000 NA A/IJ-575 x/4/2013 EPI_ISL_138739 A / H7N9
440096 NA A/Hangzhou/1/2013 EPI_ISL_138977 A / H7N9
100 440692 NA A/Environment/Shanghai/S1088/2013 EPI_ISL_138984 A / H7N9
99 440684 NA A/Chicken/Shanghai/S1053/2013 EPI_ISL_138983 A / H7N9
□ 439487 NA A/Shanghai/1/2013 EPI_ISL_138737 A / H7N9
gij388459890jgbjJN244223 Influenza A virus (A/wild bird/Korea/A3/2011(H7N9)) segment 6 neuraminidase (NA) gene, partial cd
🖵 gi 329315463 gb JF789604 Influenza A virus (A/mallard/Czech Republic/13438-29K/2010(H11N9)) segment 6 neuraminidase (NA) gene, complete cds
gi 301322559 gb HM849012 Influenza A virus (A/mallard/PT/26153/2007(H11N9)) segment 6 neuraminidase (NA) gene, complete cds
6 🖵 gi 307141891 gb HQ244409 Influenza A virus (A/Anas crecca/Spain/1460/2008(H7N9)) segment 6 neuraminidase (NA) gene, complete cds
gi 238800977 gb GQ184333 Influenza A virus (A/Baikal teal/Hongze/14/2005(H11N9)) segment 6 neuraminidase (NA) gene, complete cds
gi 157012325 gb CY025199 Influenza A virus (A/sharp-tailed sandpiper/Australia/6/2004(H11N9)) segment 6, complete sequence
gi]167859230 gb CY029883 Influenza A virus (A/sharp-tailed sandpiper/Australia/10/2004(H11N9)) segment 6, complete sequence
gi 238809457 gb AB472034 Influenza A virus (A/duck/Tsukuba/164/2005(H11N9)) NA gene for neuraminidase, complete cds, segment 6
s gij238809459 gb AB472035 Influenza A virus (A/duck/Tsukuba/239/2005(H11N9)) NA gene for neuraminidase, complete cds, segment 6
gi]238809463 gb AB472037 Influenza A virus (A/duck/Chiba/11/2006(H11N9)) NA gene for neuraminidase, complete cds, segment 6
gi 238809465 gb AB472038 Influenza A virus (A/duck/Chiba/21/2006(H11N9)) NA gene for neuraminidase, complete cds, segment 6
gij238809461 gb AB472036 Influenza A virus (A/duck/Chiba/7/2006(H11N9)) NA gene for neuraminidase, complete cds, segment 6
gi 238809455 gb AB472033 Influenza A virus (A/duck/Tsukuba/441/2005(H11N9)) NA gene for neuraminidase, complete cds, segment 6
gi 134026373 gb AB298284 Influenza A virus (A/duck/Hokkaido/W245/2004(H11N9)) NA gene for neuraminidase, complete cds.
4 rgi 159156245 gb EU263337 Influenza A virus (A/shorebird/Korea/S8/2006(H11N9)) neuraminidase (NA) mRNA, complete cds
gij269964870 gb AB516421 Influenza A virus (A/northern pintail/Aomori/1192/2008(H5N9)) NA gene for neuraminidase, complete cds
72 gi 327442250 gb AB593465 Influenza A virus (A/duck/Vietnam/G30/2008(H11N9)) viral cRNA, segment 6, complete sequence
100 gij327442269 gb AB593473 Influenza A virus (A/duck/Vietnam/G32/2008(H11N9)) viral cRNA, segment 6, complete sequence
83 gil407731704 gb JX679164 Influenza A virus (A/wild duck/Korea/SH20-27/2008(H7N9)) segment 6 neuraminidase (NA) gene, complete cds
98 gij449015303jgbjAB781663jInfluenza A virus (A/duck/Vietnam/G17-1/2011(H11N9)) NA gene for neuraminidase, complete cds
98 gij466861918jgbjAB807771jInfluenza A virus (A/duck/Vietnam/LBM81/2012(H11N9)) viral cRNA, segment 6, complete sequence

Supplementary Figure 1c



0.005

Supplementary Figure 1d



Supplementary Figure 1e

gi[302176728]gb|HM998912|Influenza A virus (A/swine/Taizhou/5/2008(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds 84 | gij302176747|gb|HM998920|Influenza A virus (A/swine/Yangzhou/1/2008(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds 11 gij332640039/gblJF906204/Influenza A virus (A/chicken/China/AH-10-01/2010(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds - gij373503263/gb/JQ356889/Influenza A virus (A/chicken/Zhejiang/611/2011(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds gi]356471825[gb]JN869522[Influenza A virus (A/chicken/Zhejiang/Q1D4/2010(H9N2)) segment 2 polymerase PB1 (PB1) gene complete cds - gil339782196/gb/JN222386/Influenza A virus (A/canine/Guangxi/1/2011(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds 99 gi|388570981|gb|JQ228395|Influenza A virus (A/equine/Guangxi/3/2011(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds ai/356471809/ab/JN869529/Influenza A virus (A/chicken/Jianasu/Q3/2010/(H9N2)) seament 2 polymerase PB1 (PB1) gene complete cds gi[399226650[gb]JX312548]Influenza A virus (A/chicken/Anhui/HF/2010(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds 40 gi]359341124|gb|JQ041392|Influenza A virus (A/chicken/Hebei/1102/2010(H5N2)) segment 2 polymerase PB1 (PB1) gene complete cds 440699 | PB1 | A/Pigeon/Shanghai/S1069/2013 | EPI ISL 138985 | | A / H7N9 gij442796578/gbjKC417065/Influenza A virus (A/chicken/Shanghai/C2/2012(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds gi[328943141|gb|JF795100|Influenza A virus (A/chicken/Shandong/KD/2009(H9N2)) segment 2 polymerase PB1 (PB1) gene complete cds gi]356471859|gb|JN869544|Influenza A virus (A/chicken/Guangdong/ZCY/2011(H9N2)) segment 2 polymerase PB1 (PB1) gene complete cds 95 gi]356471877|gb|JN869536|Influenza A virus (A/chicken/Guangdong/ZHJ/2011(H9N2)) segment 2 polymerase PB1 (PB1) gene complete cds 440691 | PB1 | A/Environment/Shanghai/S1088/2013 | EPI ISL 138984 | | A / H7N9 439501 | PB1 | A/Shanghai/2/2013 | EPI ISL 138738 | | A / H7N9 60 441600 | PB1 | A/Hangzhou/1/2013 | EPI ISL 138977 | | A / H7N9 93 440683 | PB1 | A/Chicken/Shanghai/S1053/2013 | EPI ISL 138983 | | A / H7N9 99 12 439508 | PB1 | A/Anhui/1/2013 | EPI ISL 138739 | | A / H7N9 439489 | PB1 | A/Shanghai/1/2013 | EPI ISL 138737 | | A / H7N9 gi|445069066|gb|KC464596|Influenza A virus (A/brambling/Beijing/16/2012(H9N2)) segment 2 polymerase PB1 (PB1) gene complete cds ail328943131|ablJF795060|Influenza A virus (A/chicken/Shandong/02/2010(H9N2)) seament 2 polymerase PB1 (PB1) gene complete cds gi/328943137/gb/JF795084/Influenza A virus (A/chicken/Shandong/BD/2010(H9N2)) segment 2 polymerase PB1 (PB1) gene complete cds 14 99 gi|328943139|gb|JF795092|Influenza A virus (A/chicken/Shandong/H/2009(H9N2)) segment 2 polymerase PB1 (PB1) gene complete cds gi]218931627|gb|FJ581435|Influenza A virus (A/chicken/Zhejiang/HJ/2007(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds gi]328943133|gb|JF795068|Influenza A virus (A/chicken/Shandong/03/2010(H9N2)) segment 2 polymerase PB1 (PB1) gene complete cds gi|474454963|gb|KC768058|Influenza A virus (A/duck/Shanghai/C163/2009(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds 17 gil474454966jgbjKC768059jlnfluenza A virus (A/duck/Shanghai/C164/2009(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds gi]373503282|gb|JQ356888|Influenza A virus (A/chicken/Zhejiang/607/2011(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds gi|442796581|gb|KC417066|Influenza A virus (A/chicken/Shanghai/C3/2012(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds - gij373503301|gb|JQ356887|Influenza A virus (A/chicken/Zhejiang/329/2011(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds - gi|442796575|gb|KC417064|Influenza A virus (A/chicken/Shanghai/C1/2012(H9N2)) segment 2 polymerase PB1 (PB1) and PB1-F2 protein (PB1-F2) genes complete cds 0.01

Supplementary Figure 1f



0.005

Supplementary Figure 1g

gi]302176731|gb|HM998913|Influenza A virus (A/swine/Taizhou/5/2008(H9N2)) segment 3 polymerase PA (PA) gene, complete cds gi]328943111|gb|JF795101|Influenza A virus (A/chicken/Shandong/KD/2009(H9N2)) segment 3 polymerase PA (PA) gene, complete cds gij328943101|gb|JF795061|Influenza A virus (A/chicken/Shandong/02/2010(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 35 69 gij328943109/gb/JF795093/Influenza A virus (A/chicken/Shandong/H/2009(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 58 gi]328943103|gb|JF795069|Influenza A virus (A/chicken/Shandong/03/2010(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 40 gi]328943107|gb|JF795085|Influenza A virus (A/chicken/Shandong/BD/2010(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 99 r gij339782182|gb|JN222380|Influenza A virus (A/canine/Guangxi/1/2011(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 31 gi]369828690|gb|JQ228397|Influenza A virus (A/equine/Guangxi/3/2011(H9N2)) segment 3 polymerase PA (PA) gene, complete cds gi/399226648/gb/JX312547/Influenza A virus (A/chicken/Anhui/HF/2010(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 70 50 gi]356471807|gb|JN869530|Influenza A virus (A/chicken/Jiangsu/Q3/2010(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 60 gi]359341116|gb|JQ041396|Influenza A virus (A/chicken/Hebei/1102/2010(H5N2)) segment 3 polymerase PA (PA) gene, complete cds gi]356471823|gb|JN869523|Influenza A virus (A/chicken/Zhejiang/Q1D4/2010(H9N2)) segment 3 polymerase PA (PA) gene, complete cds gi]373503259[gb]JQ356883|Influenza A virus (A/chicken/Zhejiang/611/2011(H9N2)) segment 3 polymerase PA (PA) gene, complete cds gij356471857|gb|JN869545|Influenza A virus (A/chicken/Guangdong/ZCY/2011(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 9 99 gi]356471875|gb|JN869537|Influenza A virus (A/chicken/Guangdong/ZHJ/2011(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 99 gi/442796586/gb/KC417062/Influenza A virus (A/chicken/Shanghai/C2/2012(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 10 – gi|442796588|gb|KC417063|Influenza A virus (A/chicken/Shanghai/C3/2012(H9N2)) segment 3 polymerase PA (PA) gene, complete cds gi]373503278|gb|JQ356882|Influenza A virus (A/chicken/Zhejiang/607/2011(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 98 gij442796584|gb|KC417061|Influenza A virus (A/chicken/Shanghai/C1/2012(H9N2)) segment 3 polymerase PA (PA) gene, complete cds gij445069068|gb|KC464597|Influenza A virus (A/brambling/Beijing/16/2012(H9N2)) segment 3 polymerase PA (PA) gene, complete cds 91 89 | PA | A/Environment/Shanghai/S1088/2013 | EPI_ISL_138984 | | A / H7N9 99 A/Shanghai/1/2013 | EPI_ISL_138737 | | A / H7N9 98 440697 | PA | A/Pigeon/Shanghai/S1069/2013 | EPI_ISL_138985 | | A / H7N9 71 441599 | PA | A/Hangzhou/1/2013 | EPI_ISL_138977 | | A / H7N9 60 440681 | PA | A/Chicken/Shanghai/S1053/2013 | EPI_ISL_138983 | | A / H7N9 76 439503 | PA | A/Anhui/1/2013 | EPI_ISL_138739 | | A / H7N9 52 439498 | PA | A/Shanghai/2/2013 | EPI_ISL_138738 | | A / H7N9

0.005

Supplementary Figure 1h

gi]328943057|gb|JF795103|Influenza A virus (A/chicken/Shandong/KD/2009(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds gij302176735/gb/HM998915/Influenza A virus (A/swine/Taizhou/5/2008(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds - gi|445069072|gb|KC464599|Influenza A virus (A/brambling/Beijing/16/2012(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds gi|474454991|gb|KC768050|Influenza A virus (A/duck/Shanghai/C164/2009(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds gi|474455168|gb|KC779053|Influenza A virus (A/swine/Henan/Y1/2009(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds 42 gij328943049|gb|JF795071|Influenza A virus (A/chicken/Shandong/03/2010(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds . gij328943053|gb|JF795087|Influenza A virus (A/chicken/Shandong/BD/2010(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds gi]356471855[gb]JN869547[Influenza A virus (A/chicken/Guangdong/ZCY/2011(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds gi[356471873]gb|JN869539|Influenza A virus (A/chicken/Guangdong/ZHJ/2011(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds – gil442796599/gbl/KC417055/Influenza A virus (A/chicken/Shanghai/C1/2012(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds 66 J 62 gij442796603jgbjKC417057|Influenza A virus (A/chicken/Shanghai/C3/2012(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds 439491 | NP | A/Shanghai/1/2013 | EPI ISL 138737 | | A / H7N9 gi|356471821|gb|JN869524|Influenza A virus (A/chicken/Zhejiang/Q1D4/2010(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds gi]359341100|gb|JQ041404|Influenza A virus (A/chicken/Hebei/1102/2010(H5N2)) segment 5 nucleocapsid protein (NP) gene complete cds gi|474454989|gb|KC768049|Influenza A virus (A/duck/Shanghai/C163/2009(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds gi]373503257|gb|JQ356880|Influenza A virus (A/chicken/Zhejiang/611/2011(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds 36 gij399226643|gb|JX312545|Influenza A virus (A/chicken/Anhui/HF/2010(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds 65 N869531|Influenza A virus (A/chicken/Jiangsu/Q3/2010(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds gi]373503295/gb/JQ356878/Influenza A virus (A/chicken/Zhejiang/329/2011(H9N2)) segment 5 nucleocapsid protein (NP) gene complete cds 440694 | NP | A/Pigeon/Shanghai/S1069/2013 | EPI ISL 138985 | | A / H7N9 27 440686 | NP | A/Environment/Shanghai/S1088/2013 | EPI ISL 138984 | | A / H7N9 440678 | NP | A/Chicken/Shanghai/S1053/2013 | EPI ISL 138983 | | A / H7N9 441000 | NP | A/Hangzhou/1/2013 | EPI ISL 138977 | | A / H7N9 439505 | NP | A/Anhui/1/2013 | EPI ISL 138739 | | A / H7N9 439496 | NP | A/Shanghai/2/2013 | EPI ISL 138738 | | A / H7N9 0.005

Supplementary Figure 1i



Supplementary Figure 1j

gi/262182042/gb/GQ373138/Influenza A virus (A/chicken/Shandong/LY/2006(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, comp 100 gi[262182071]gb]GQ373148|Influenza A virus (A/chicken/Hebei/0329/2007(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, compl 41 gi|157379959|gb|CY023828|Influenza A virus (A/chicken/Hunan/5260/2005(H9N2)) segment 8 sequence 57 - gil157379940lgblCY023820lInfluenza A virus (A/chicken/Hunan/4444/2005(H9N2)) segment 8 seguence gi|157379997|gb|CY023844|Influenza A virus (A/chicken/Hunan/6108/2005(H9N2)) segment 8 sequence gi]346989900|gb|JN653679|Influenza A virus (A/chicken/Hubei/10/2009(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, complet gij344222092/gbJJN571295/Influenza A virus (A/environment/Chang Sha/6/2009(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, 98 95 gi|472401638|gb|KC767263|Influenza A virus (A/chicken/Shaanxi/11/2012(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, compl - gi]325910999(gb|CY087191|Influenza A virus (A/duck/Tibet/S2/2009(H9N2)) nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, complete cds 82 gij332640053|gb|JF906210|Influenza A virus (A/chicken/China/AH.10.01/2010(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, c 68 gi[325910961|gb|CY087175|Influenza A virus (A/chicken/Tibet/S1/2009(H9N2)) nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, complete cds - gil328942969(gblJF795148)Influenza A virus (A/chicken/Shandong/01/2009(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes. comp - gij328942927|gb|JF795042|Influenza A virus (A/chicken/Shandong/01/2010(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, comp 847 gij328942933]gbJJF795058|Influenza A virus (A/chicken/Shandong/02/2009(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, comp 91 gi]347364717|gb|CY099014|Influenza A virus (A/environment/Xinjiang/6/2009(H5N1)) nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, complete cd - gi/262182045/gb/GQ373139/Influenza A virus (A/chicken/Shandong/1231/2008(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, co gij300808489/gb/HM751198/Influenza A virus (A/chicken/Shandong/SG2/2009(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, com an gli218931622(gb)FJ581433|Influenza A virus (A/chicken/Zhejiang/HJ/2007(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, comp gij328942951jgbjJF795106jInfluenza A virus (A/chicken/Shandong/KD/2009(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, comp - gi/262182051/gb/GQ373141/Influenza A virus (A/chicken/Shandong/12/2008(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, comp gij474454978jgbjKC768051jInfluenza A virus (A/duck/Shanghai/C60/2007(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, comple aij396578042/ab/AB735627/Influenza A virus (A/chicken/Vietnam/OIE-1611/2012/H9N2)) NS2, NS1 genes for nonstructural protein 2, nonstructural protein 1, complete c - gi|445069079|gb|KC464602|Influenza A virus (A/brambling/Beijing/16/2012(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, com -gi]346989810|gb|JN653684|Influenza A virus (A/chicken/Taixing/10/2010(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, compl 64 gil346989990/gbl,JN653674/Influenza A virus (A/chicken/Xigou/1/2011(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, complete 61 C gi[346990008]gb],N653673|Influenza A virus (A/pigeon/Xuzhou/1/2011(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, complete 89 gij346990062|gb|JN653670|Influenza A virus (A/chicken/Shuanggou/1/2011(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, comp L gij346989954|gb|JN653676|Influenza A virus (A/chicken/Dawang/1/2011(H9N2)) segment 8 nuclear export protein (NEP) and nonstructural protein 1 (NS1) genes, complet - 439494 | NS | A/Shanghai/1/2013 | EPI_ISL_138737 | | A / H7N9 440695 | NS | A/Pigeon/Shanghai/S1069/2013 | EPI_ISL_138985 | | A / H7N9 440687 | NS | A/Environment/Shanghai/S1088/2013 | EPI_ISL_138984 | | A / H7N9 94 440679 | NS | A/Chicken/Shanghai/S1053/2013 | EPI | ISL | 138983 | | A / H7N9 65 439510 | NS | A/Anhui/1/2013 | EPI ISL 138739 | | A / H7N9 - 441001 | NS | A/Hangzhou/1/2013 | EPI ISL 138977 | | A / H7N9 11 439499 | NS | A/Shanghai/2/2013 | EPI_ISL_138738 | | A / H7N9 L 005