

Introduction of Eurasian-origin Influenza A(H8N4) Virus into North America by Migratory Birds

Technical Appendix

Technical Appendix Table. Virus isolates sharing $\geq 99\%$ nt identity at ≥ 1 gene segments with A/northern pintail/Alaska/UGA16–3997/2016(H8N4) as identified on National Center for Biotechnology Information GenBank database on March 12, 2018

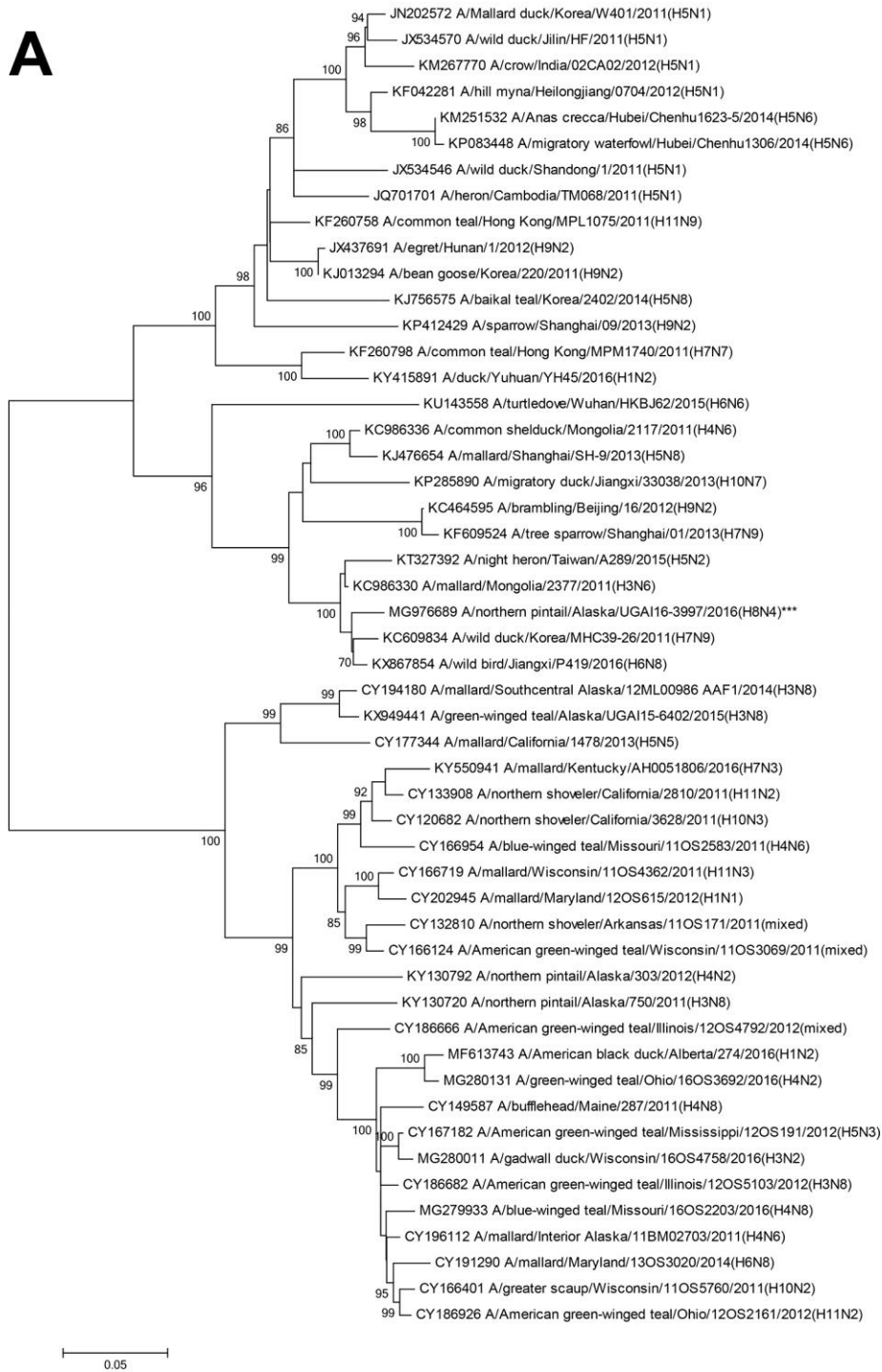
Segment	GenBank accession no.	Strain name	Shared nucleotide identity
PB2	KY131326.1	A/northern pintail/Alaska/UGA15-6994/2015(H6N1)	99%
PB2	KY131357.1	A/northern pintail/Alaska/UGA15-7300/2015(H6N1)	99%
PB2	KX949521.1	A/northern pintail/Alaska/UGA15-7403/2015(H3N8)	99%
PB2	LC053481.1	A/duck/Vietnam/LBM798/2014(H3N6)	99%
PB2	KU881717.1	A/Anseriformes/Anhui/L259/2014(H1N1)	99%
PB2	LC148827.1	A/duck/Hokkaido/W9/2015(H1N1)	99%
PB2	LC339728.1	A/duck/Hokkaido/10/2015(H3N6)	99%
PB2	KU881701.1	A/Anseriformes/Anhui/L25/2014(H1N1)	99%
PB2	KT717295.1	A/Anser fabalis/China/Anhui/L221/2014(H6N1)	99%
PB2	KY415872.1	A/duck/Hubei/ZYSYG15/2015(H6N2)	99%
PB2	KY415871.1	A/duck/Hubei/ZYSYG14/2015(H6N2)	99%
PB2	KY415870.1	A/duck/Hubei/ZYSYG1/2015(H6N2)	99%
PB2	KU143586.1	A/duck/Wuhan/WHYF05/2014(H9N2)	99%
PB2	KU881669.1	A/Anseriformes/Anhui/S3/2014(H1N1)	99%
PB2	KY415879.1	A/duck/Hubei/ZYSYF8/2015(H6N6)	99%
PB2	KX121185.1	A/bean goose/Hubei/SZY200/2016(H11N9)	99%
PB1	LC339617.1	A/duck/Hokkaido/W165/2015(H11N6)	99%
PA	LC371817.1	A/duck/Hokkaido/207/2014(H8N2)	99%
PA	KY130810.1	A/glaucous-winged gull/Alaska/473/2012(H3N8)	99%
PA	LC042057.1	A/duck/Hokkaido/W280/2014(H5N3)	99%
PA	LC042050.1	A/duck/Hokkaido/W240/2014(H5N3)	99%
PA	LC339634.1	A/duck/Hokkaido/W19/2013(H7N2)	99%
PA	KU160978.1	A/duck/Hunan/S1012/2009(H4N6)	99%
PA	KY971098.1	A/pigeon/Zhejiang/1120087/2014(H1N2)	99%
PA	KY971097.1	A/goose/Zhejiang/1120085/2014(H1N2)	99%
PA	KY971096.1	A/goose/Zhejiang/1120084/2014(H1N2)	99%
PA	KY971095.1	A/goose/Zhejiang/1120083/2014(H1N2)	99%
PA	KY971094.1	A/goose/Zhejiang/1120078/2014(H1N2)	99%
PA	KY971092.1	A/goose/Zhejiang/1120074/2014(H1N2)	99%
PA	LC339530.1	A/duck/Hokkaido/201/2014(H1N1)	99%
PA	KY971093.1	A/goose/Zhejiang/1120076/2014(H1N2)	99%
PA	KY971091.1	A/goose/Zhejiang/1120069/2014(H1N2)	99%
PA	JX454750.1	A/wild duck/Korea/SH5-26/2008(H4N6)	99%
PA	GU086282.1	A/duck/Korea/A93/2008(H5N2)	99%
PA	GQ325638.1	A/environment/Dongting Lake/Hunan/3-9/2007(H10N8)	99%
PA	GQ290468.1	A/environment/Dongting Lake/Hunan/3-9/2007(H10N8)	99%
PA	KU160938.1	A/duck/Henan/S1091/2010(H4N6)	99%
PA	JQ041395.1	A/duck/Hebei/0908/2009(H5N2)	99%
PA	JX454742.1	A/wild duck/Korea/PSC6-1/2009(H4N6)	99%
PA	HM745397.1	A/duck/Jiangxi/k0701/2009(H11N2)	99%
PA	KC899731.1	A/wild duck/SH38-64/2010(H2N8)	99%
PA	CY098237.1	A/aquatic bird/Korea/CN9/2009(H6N8)	99%
PA	GQ325654.1	A/environment/Dongting Lake/Hunan/3-9/2007(H10N8)	99%
PA	KP862040.1	A/duck/Hunan/S4280/2009(H10N8)	99%
PA	KC899729.1	A/wild duck/SH38-56/2010(H2N8)	99%
PA	KF260286.1	A/duck/Yunnan/87/2007(H7N6)	99%
PA	KF260249.1	A/duck/Jiangxi/21669/2009(H7N7)	99%
PA	KX297824.1	A/environment/Korea/W148/2006(H7N7)	99%
PA	KX297823.1	A/environment/Korea/W143/2006(H7N7)	99%
PA	KU160930.1	A/duck/Guizhou/S1167/2010(H4N6)	99%

Segment	GenBank accession no.	Strain name	Shared nucleotide identity
PA	KF260254.1	A/chicken/Jiangxi/2369/2010(H7N7)	99%
PA	JX454718.1	A/duck/Korea/DY104/2007(H4N6)	99%
PA	CY049803.1	A/gadwall/Altai/1326/2007(H3N8)	99%
PA	KU921397.1	A/duck/Shanghai/602/2009(H10N8)	99%
PA	KX297827.1	A/environment/Korea/W169/2007(H7N7)	99%
PA	KP287965.1	A/duck/Jiangxi/26141/2009(H10N7)	99%
PA	KF260251.1	A/duck/Jiangxi/23008/2009(H7N7)	99%
HA	LC339587.1	A/duck/Hokkaido/95/2014(H8N4)	99%
NP	LC339692.1	A/duck/Hokkaido/WZ1/2014(H11N2)	99%
NP	LC371795.1	A/duck/Hokkaido/166/2014(H5N2)	99%
NP	LC042066.1	A/duck/Hokkaido/WZ1/2014(H11N2)	99%
NP	LC339612.1	A/duck/Hokkaido/W150/2014(H4N6)	99%
NP	LC339596.1	A/duck/Hokkaido/W118/2014(H4N6)	99%
NP	CY079214.1	A/avian/Japan/8KI0195/2008(H6N8)	99%
NP	AB530993.1	A/mallard/Hokkaido/24/2009(H5N1)	99%
NP	KF259795.1	A/common teal/Hong Kong/MPK630/2009(H10N9)	99%
NP	KF259796.1	A/eurasian wigeon/Hong Kong/MPK653/2009(H11N9)	99%
NP	KF259784.1	A/eurasian wigeon/Hong Kong/MPK655/2009(H11N9)	99%
NP	JX570854.1	A/canvasback/Xianghai/428/2011(H5N2)	99%
NP	LC121485.1	A/duck/Hokkaido/W90/2007(H10N7)	99%
NP	JX570870.1	A/green-winged teal/Xianghai/430/2011(H5N2)	99%
NP	CY079238.1	A/avian/Japan/8KI0150/2008(H3N8)	99%
NP	AB546150.1	A/pintail/Aomori/422/2007(H1N1)	99%
NA	LC339589.1	A/duck/Hokkaido/95/2014(H8N4)	99%
N4	LC339565.1	A/duck/Hokkaido/238/2014(H8N4)	99%
N4	LC339557.1	A/duck/Hokkaido/222/2014(H8N4)	99%
N4	LC339549.1	A/duck/Hokkaido/221/2014(H8N4)	99%
N4	LC339541.1	A/duck/Hokkaido/220/2014(H8N4)	99%
N4	KU143355.1	A/duck/Wenzhou/YJYF78/2015(H1N4)	99%
N4	JN817552.1	A/wild bird/Korea/A02/2011(H10N4)	99%
M	KU881675.1	A/Anseriformes/Anhui/S3/2014(H1N1)	99%
M	KU881691.1	A/Anseriformes/Anhui/S107/2014(H1N1)	99%
M	KU881707.1	A/Anseriformes/Anhui/L25/2014(H1N1)	99%
M	KU881723.1	A/Anseriformes/Anhui/L259/2014(H1N1)	99%
M	KX066874.1	A/wild bird/Korea/SK14/2014(H1N1)	99%
M	KT717285.1	A/Anser fabalis/China/Anhui/L144/2014(H6N1)	99%
M	KT717301.1	A/Anser fabalis/China/Anhui/L221/2014(H6N1)	99%
M	KU143301.1	A/wild bird/Wuhan/CDHN09/2015(H6N2)	99%
M	KU143302.1	A/wild bird/Wuhan/CDHN15/2015(H6N2)	99%
M	LC053487.1	A/duck/Vietnam/LBM798/2014(H3N6)	99%
M	LC121311.1	A/duck/Mongolia/179/2015(H3N8)	99%
M	LC121303.1	A/duck/Mongolia/173/2015(H3N8)	99%
M	KU160854.1	A/duck/Chongqing/S2086/2012(H4N8)	99%
M	KJ907490.1	A/black-necked crane/Zhaotong/ZT-12/2013(H1N2)	99%
M	MF147259.1	A/mallard duck/Netherlands/8/2014(H7N5)	99%
M	KX978943.1	A/mallard duck/Netherlands/2/2015(H7N7)	99%
M	KX977880.1	A/mallard duck/Netherlands/3/2015(H7N7)	99%
M	LC121439.1	A/duck/Mongolia/709/2015(H10N7)	99%
M	LC121423.1	A/duck/Mongolia/626/2015(H10N7)	99%
M	LC121383.1	A/duck/Mongolia/499/2015(H10N7)	99%
M	KF462313.1	A/European teal/Chany/63/2011(H3N8)	99%
M	KY635804.1	A/duck/Bangladesh/24705/2015(H7N1)	99%
M	KY635683.1	A/duck/Bangladesh/24704/2015(H15N9)	99%
M	KY402068.1	A/hooded crane/Korea/1176/2016(H1N1)	99%
M	AB981453.1	A/muscovy duck/Quang Ninh/131/2013(H3N8)	99%
M	CY146551.1	A/duck/Hunan/S11090/2012(H4N6)	99%
NS	KU881716.1	A/Anseriformes/Anhui/L167/2014(H1N1)	99%
NS	KT717222.1	A/Anser fabalis/China/Anhui/S39/2014(H6N2)	99%
NS	KT717254.1	A/Anser fabalis/China/Anhui/S148/2014(H6N2)	99%
NS	KU143433.1	A/chicken/Wuhan/WHJF/2014(H5N2)	99%
NS	KT717230.1	A/Anser fabalis/China/Anhui/S45/2014(H6N2)	99%
NS	KT717246.1	A/Anser fabalis/China/Anhui/S104/2014(H6N2)	99%
NS	KU160967.1	A/duck/Hubei/S2213/2012(H4N2)	99%
NS	KJ526011.1	A/duck/Thailand/CU-11836C/2011(H1N3)	99%
NS	KC609961.1	A/mallard/Korea/NHG187/2008(H7N7)	99%
NS	MG367026.1	A/grey heron/Korea/VI1511105/2015(H3N8)	99%
NS	MG367025.1	A/mallard duck/Korea/VI1511095/2015(H4N6)	99%
NS	MG367024.1	A/mallard duck/Korea/VI1511090/2015(H4N6)	99%
NS	MG367023.1	A/great egret/Korea/VI1511065/2015(H4N6)	99%

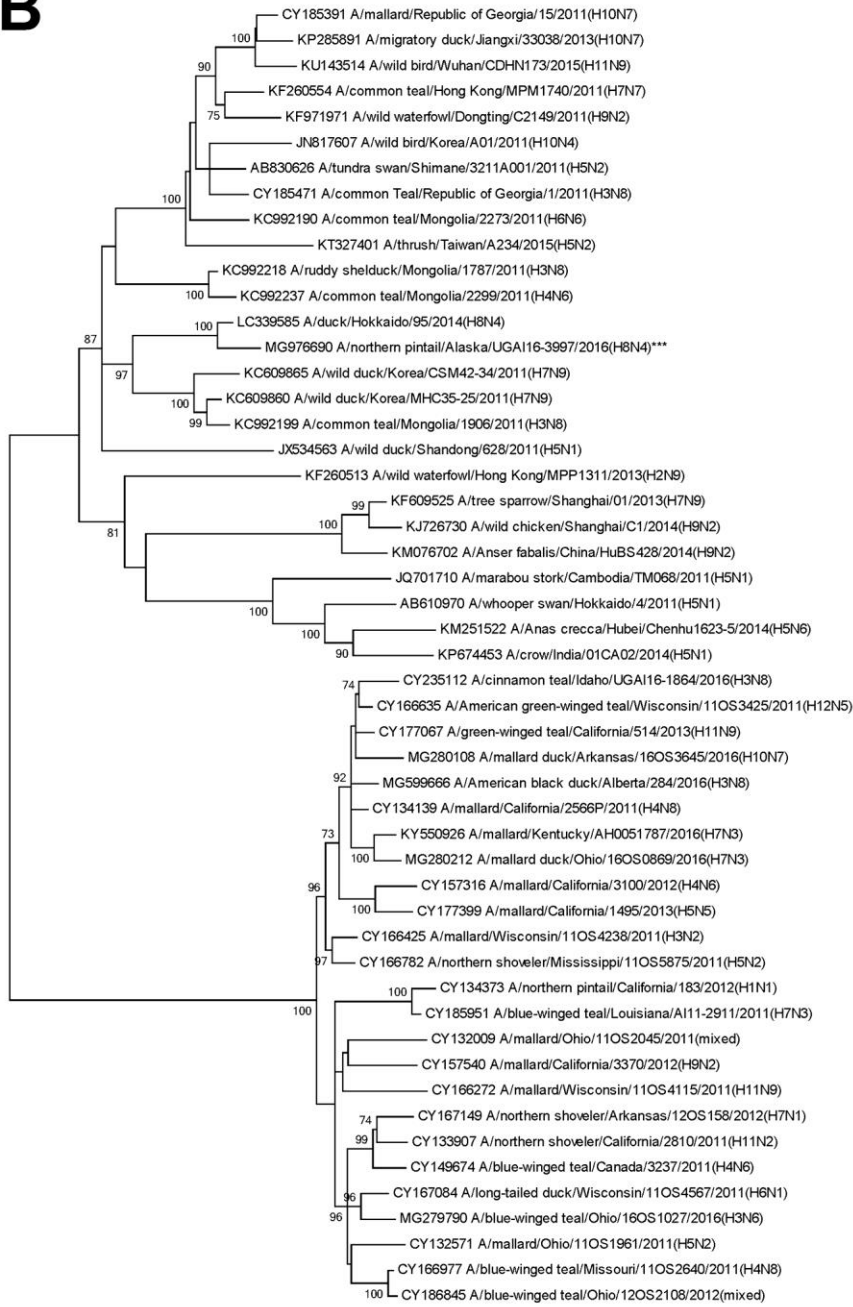
Segment	GenBank accession no.	Strain name	Shared nucleotide identity
NS	MG367022.1	A/mallard duck/Korea/VI160646/2016(H6N5)	99%
NS	MG367021.1	A/mallard duck/Korea/VI160383/2016(H6N2)	99%
NS	MG367020.1	A/mallard duck/Korea/VI160266/2016(H10N1)	99%
NS	MG367019.1	A/falcata teal/Korea/VI160246/2016(H11N9)	99%
NS	MG367018.1	A/green-winged teal/Korea/VI160181/2016(H10N1)	99%
NS	MG367017.1	A/green-winged teal/Korea/VI160151/2016(H11N9)	99%
NS	MG367016.1	A/mallard duck/Korea/VI154461/2015(H4N6)	99%
NS	MG367015.1	A/mallard duck/Korea/VI152573/2015(H11N9)	99%
NS	MG367014.1	A/mallard duck/Korea/VI152538/2015(H5N3)	99%
NS	MG367013.1	A/mallard duck/Korea/VI152533/2015(H5N3)	99%
NS	MG367012.1	A/mallard duck/Korea/VI147540/2014(H11N9)	99%
NS	MG367011.1	A/mallard duck/Korea/VI147532/2014(H11N9)	99%
NS	MG367010.1	A/mallard duck/Korea/VI146993/2014(H3N8)	99%
NS	MG367009.1	A/mallard duck/Korea/VI142218/2014(H3N8)	99%
NS	MG367008.1	A/mallard duck/Korea/VI141432/2014(H3N8)	99%
NS	MG367007.1	A/mallard duck/Korea/VI141407/2014(H7N7)	99%
NS	MG367006.1	A/hooded crane/Korea/VI160792/2016(H4N8)	99%
NS	MG367005.1	A/mallard duck/Korea/VI150161/2015(H7N6)	99%
NS	MG367004.1	A/mallard duck/Korea/VI150051/2015(H7N1)	99%
NS	MG367003.1	A/mallard duck/Korea/CBU143781/2014(H1N8)	99%
NS	MG367002.1	A/mallard duck/Korea/CBU143751/2014(H4N1)	99%
NS	MG367001.1	A/mallard duck/Korea/CBU143501/2014(H4N1)	99%
NS	MG367000.1	A/mallard duck/Korea/CBU143491/2014(H4N6)	99%
NS	MG366999.1	A/mallard duck/Korea/CBU142416/2014(H3N6)	99%
NS	MG366998.1	A/hooded crane/Korea/VI1513992/2015(H3N8)	99%
NS	MG366997.1	A/Northern pintail/Korea/VI1511874/2015(H3N8)	99%
NS	MG366996.1	A/mallard duck/Korea/VI1511070/2015(H10N5)	99%
NS	MG366995.1	A/falcata teal/Korea/VI160216/2016(H2N5)	99%
NS	MG366994.1	A/mallard duck/Korea/VI146916/2014(H7N4)	99%
NS	MG366993.1	A/mallard duck/Korea/VI146688/2014(H6N8)	99%
NS	MG366992.1	A/mallard duck/Korea/VI146668/2014(H6N8)	99%
NS	MG366991.1	A/mallard duck/Korea/VI145825/2014(H7N7)	99%
NS	MG366990.1	A/mallard duck/Korea/VI142063/2014(H7N7)	99%
NS	MG366989.1	A/mallard duck/Korea/VI141417/2014(H3N8)	99%
NS	MG366988.1	A/hooded crane/Korea/VI160196/2016(H1N1)	99%
NS	MG366987.1	A/mallard duck/Korea/CBU142426/2014(H4N2)	99%
NS	MG366985.1	A/mallard duck/Korea/VI141467/2014(H3N8)	99%
NS	LC339735.1	A/duck/Hokkaido/10/2015(H3N6)	99%
NS	KC609960.1	A/Northern shoveler/Korea/SD175/2008(H7N3)	99%
NS	KC899765.1	A/wild duck/SH17-34/2008(H2N3)	99%
NS	KF260044.1	A/duck/Yunnan/2908/2009(H11N9)	99%
NS	JX454749.1	A/wild duck/Korea/SH5-26/2008(H4N6)	99%
NS	LC371790.1	A/duck/Hokkaido/162/2013(H2N1)	99%
NS	MG366986.1	A/mallard duck/Korea/VI141412/2014(H1N1)	99%
NS	KX162596.1	A/duck/Shanghai/408-1/2009(H4N6)	99%
NS	KF357802.1	A/duck/Zhejiang/4613/2013(H3N2)	99%
NS	KJ526003.1	A/duck/Thailand/CU-12677T/2012(H11N6)	99%
NS	JX570845.1	A/spot-billed duck/Xianghai/427/2011(H5N2)	99%
NS	JN852799.1	A/chicken/Korea/KNUSWR09/2009(H9N2)	99%
NS	JN852807.1	A/chicken/Korea/KNUWSJ09/2009(H9N2)	99%
NS	JN087364.1	A/environment/Korea/SH11-10/2009(H3N8)	99%
NS	HQ897969.1	A/mallard/Korea/KNU YP09/2009(H1N1)	99%
NS	GU086262.1	A/duck/Korea/A14/2008(H5N2)	99%
NS	KY785842.1	A/chicken/Korea/C47/2009(H9N2)	99%
NS	KX162597.1	A/duck/Shanghai/420-2/2009(H4N6)	99%
NS	KX297819.1	A/environment/Korea/W478/2014(H7N7)	99%
NS	KX121192.1	A/bean goose/Hubei/SZY200/2016(H11N9)	99%
NS	KJ525995.1	A/duck/Thailand/CU-12679C/2012(H4N6)	99%
NS	KJ525991.1	A/duck/Thailand/CU-12659T/2012(H4N6)	99%
NS	JN852791.1	A/chicken/Korea/KNUGJ09/2009(H9N2)	99%
NS	CY079247.1	A/avian/Japan/8KI0135/2008(H6N5)	99%
NS	GU086258.1	A/chicken/Korea/A170/2009(H9N2)	99%
NS	LC367414.1	A/duck/Mongolia/53/2011(H3N8)	99%
NS	LC367406.1	A/duck/Mongolia/50/2010(H10N8)	99%
NS	LC367398.1	A/duck/Mongolia/496/2010(H3N3)	99%
NS	LC367374.1	A/duck/Mongolia/46/2010(H10N8)	99%
NS	KT266946.1	A/duck/Guangxi/113/2012(H6N8)	99%
NS	KX297813.1	A/environment/Korea/W178/2007(H7N7)	99%
NS	KX297811.1	A/environment/Korea/W156/2006(H7N7)	99%

Segment	GenBank accession no.	Strain name	Shared nucleotide identity
NS	LC042061.1	A/duck/Hokkaido/W280/2014(H5N3)	99%
NS	LC042054.1	A/duck/Hokkaido/W240/2014(H5N3)	99%
NS	KF260030.1	A/northern shoveler/Hong Kong/MPC657/2006(H10N9)	99%
NS	KC693602.1	A/duck/Taiwan/DV1846/2010(H3N8)	99%
NS	JN244259.1	A/duck/Korea/A349/2009(H7N2)	99%
NS	JN852783.1	A/duck/Korea/KNUDPJ09/2009(H9N2)	99%
NS	AB593435.1	A/duck/Vietnam/G119/2006(H3N8)	99%
NS	FJ750868.1	A/mallard/Korea/GH170/2007(H7N7)	99%
NS	GQ414964.1	A/spot-billed duck/Korea/528/2008(H6N8)	99%
NS	LC339527.1	A/duck/Hokkaido/20/2015(H3N8)	99%
NS	LC332535.1	A/duck/Hokkaido/17/2015(H3N8)	99%
NS	LC332527.1	A/duck/Hokkaido/15/2015(H3N8)	99%
NS	LC332519.1	A/duck/Hokkaido/14/2015(H3N8)	99%
NS	LC332511.1	A/duck/Hokkaido/13/2015(H3N8)	99%
NS	LC332503.1	A/duck/Hokkaido/12/2015(H3N8)	99%
NS	GU086257.1	A/chicken/Korea/A146/2009(H9N2)	99%
NS	LC367502.1	A/duck/Mongolia/675/2010(H1N1)	99%
NS	LC367390.1	A/duck/Mongolia/493/2010(H10N8)	99%
NS	LC349403.1	A/duck/Mongolia/371/2010(H10N8)	99%
NS	LC349395.1	A/duck/Mongolia/340/2011(H4N8)	99%
NS	KY785818.1	A/chicken/Korea/C36/2009(H9N2)	99%
NS	KX297810.1	A/environment/Korea/W152/2006(H7N7)	99%
NS	KU158918.1	A/chicken/Nanjing/B854-2/2011(H3N8)	99%
NS	KU158917.1	A/duck/Nanjing/A1591-1/2010(H3N8)	99%
NS	KT318510.1	A/duck/Thailand/CU-11671C/2011(H3N8)	99%
NS	KF886485.1	A/wild bird/Jilin/SJ95/2012(H9N2)	99%
NS	LC000592.1	A/muscovy duck/Vietnam/LBM687/2014(H4N6)	99%
NS	KF260026.1	A/common teal/Hong Kong/MPL1075/2011(H11N9)	99%
NS	KF013922.1	A/duck/Guangxi/GXd-1/2011(H1N2)	99%
NS	KC876695.1	A/wild goose/Dongting/C1037/2011(H12N8)	99%
NS	JX273028.1	A/duck/Korea/J31/2009(H7N2)	99%
NS	AB593467.1	A/duck/Vietnam/G30/2008(H11N9)	99%
NS	GQ414969.1	A/spot-billed duck/Korea/546/2008(H6N1)	99%
NS	GQ414968.1	A/spot-billed duck/Korea/536/2008(H6N1)	99%
NS	GQ414965.1	A/mallard/Korea/L08-8/2008(H6N1)	99%
NS	GQ414963.1	A/spot-billed duck/Korea/527/2008(H6N1)	99%
NS	GQ414970.1	A/spot-billed duck/Korea/537/2008(H6N1)	99%
NS	LC367422.1	A/duck/Mongolia/565/2011(H8N4)	99%
NS	LC349339.1	A/duck/Mongolia/258/2011(H8N4)	99%
NS	LC339815.1	A/duck/Mongolia/121/2011(H10N7)	99%
NS	MG021169.1	A/duck/Jiangshu/YZ916/2016(H3N2)	99%
NS	KY785878.1	A/duck/Korea/D30/2009(H9N2)	99%
NS	KY785810.1	A/chicken/Korea/C31/2009(H9N2)	99%
NS	KU921413.1	A/duck/Fujian/1761/2010(H10N3)	99%
NS	KX867861.1	A/wild bird/Jiangxi/P419/2016(H6N8)	99%
NS	KX028846.1	A/duck/Zhejiang/727D26/2013(H11N3)	99%
NS	KX028845.1	A/duck/Zhejiang/727D25/2013(H11N3)	99%
NS	KX028844.1	A/duck/Zhejiang/727D22/2013(H11N3)	99%
NS	KX028842.1	A/duck/Zhejiang/727D7/2013(H11N3)	99%
NS	KX028841.1	A/duck/Zhejiang/727D2/2013(H11N3)	99%
NS	KU161015.1	A/duck/Jiangxi/S21046/2012(H4N2)	99%
NS	KR265548.1	A/duck/Japan/11OG1032/2011(H5N2)	99%
NS	KR265556.1	A/duck/Japan/11OG1038/2011(H5N2)	99%
NS	KR265564.1	A/duck/Japan/11OG1083/2011(H5N2)	99%
NS	KR265572.1	A/duck/Japan/11OG1084/2011(H5N2)	99%
NS	KP416974.1	A/duck/Jiangxi/5416/2014(mixed)	99%
NS	KP285481.1	A/duck/Jiangxi/15846/2013(H10N3)	99%
NS	KC871461.1	A/mallard/Mongolia/1581/2010(H3N8)	99%
NS	KF260070.1	A/wild waterfowl/Hong Kong/MPM3375/2011(H7N6)	99%
NS	KF260001.1	A/duck/Jiangxi/13291/2009(H7N3)	99%
NS	CY146576.1	A/duck/Hunan/S11313/2012(H4N2)	99%
NS	KF013930.1	A/duck/Guangxi/GXd-4/2011(H1N2)	99%
NS	AB546184.1	A/pintail/Aomori/1130/2008(H1N3)	99%
NS	CY060339.1	A/mallard/Sweden/58/2003(H11N1)	99%
NS	FJ802405.1	A/duck/Thailand/AY-354/2008(H3N2)	99%
NS	EU580556.1	A/Anas querquedula/Astrakhan/3091/2002(H4N8)	99%
NS	EU158147.1	A/duck/Jiangxi/1742/03(H7N7)	99%
NS	GU086259.1	A/duck/Korea/A174/2009(H9N2)	99%

*M, matrix; N, neuraminidase; NP, nucleoprotein; NS, nonstructural; PA, polymerase acidic; PB, polymerase basic.

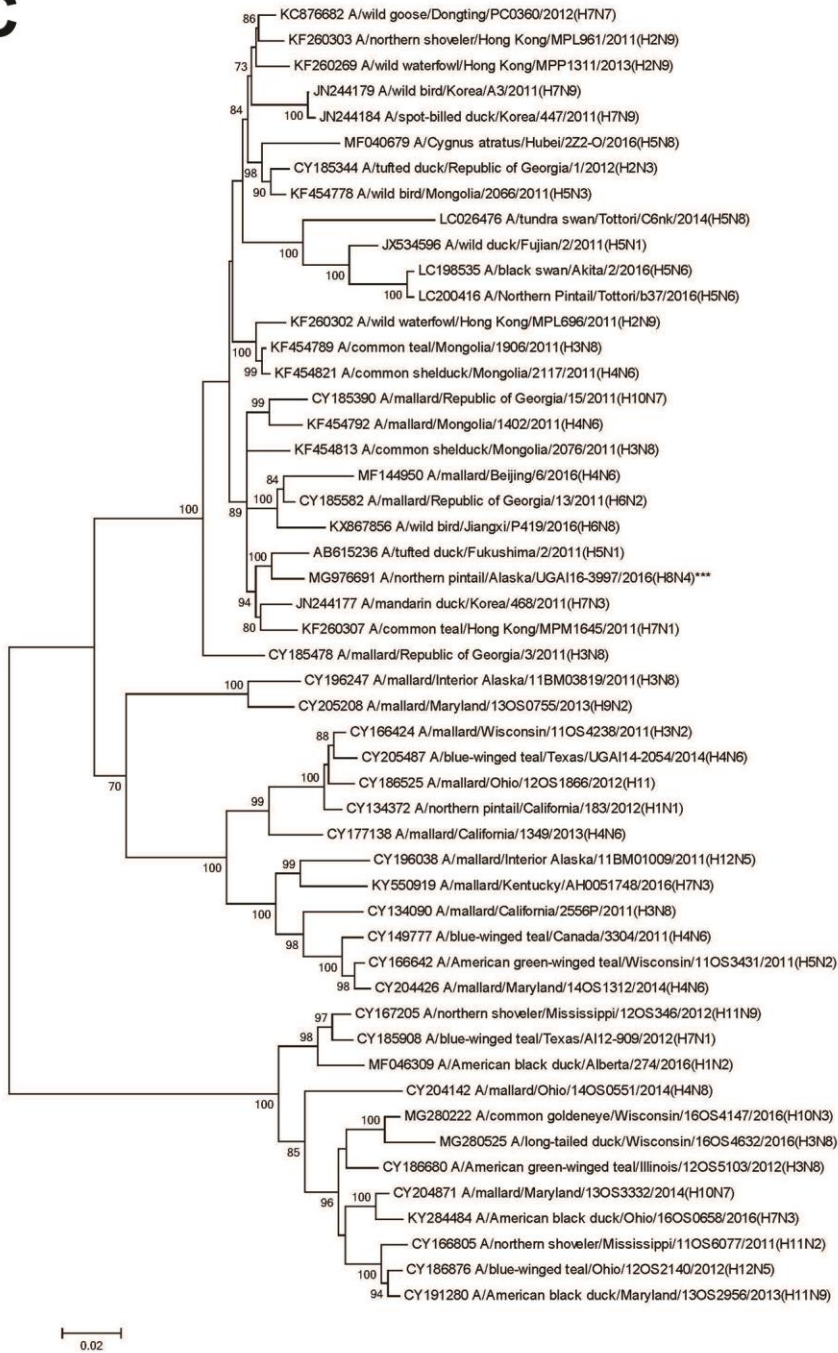
A

B

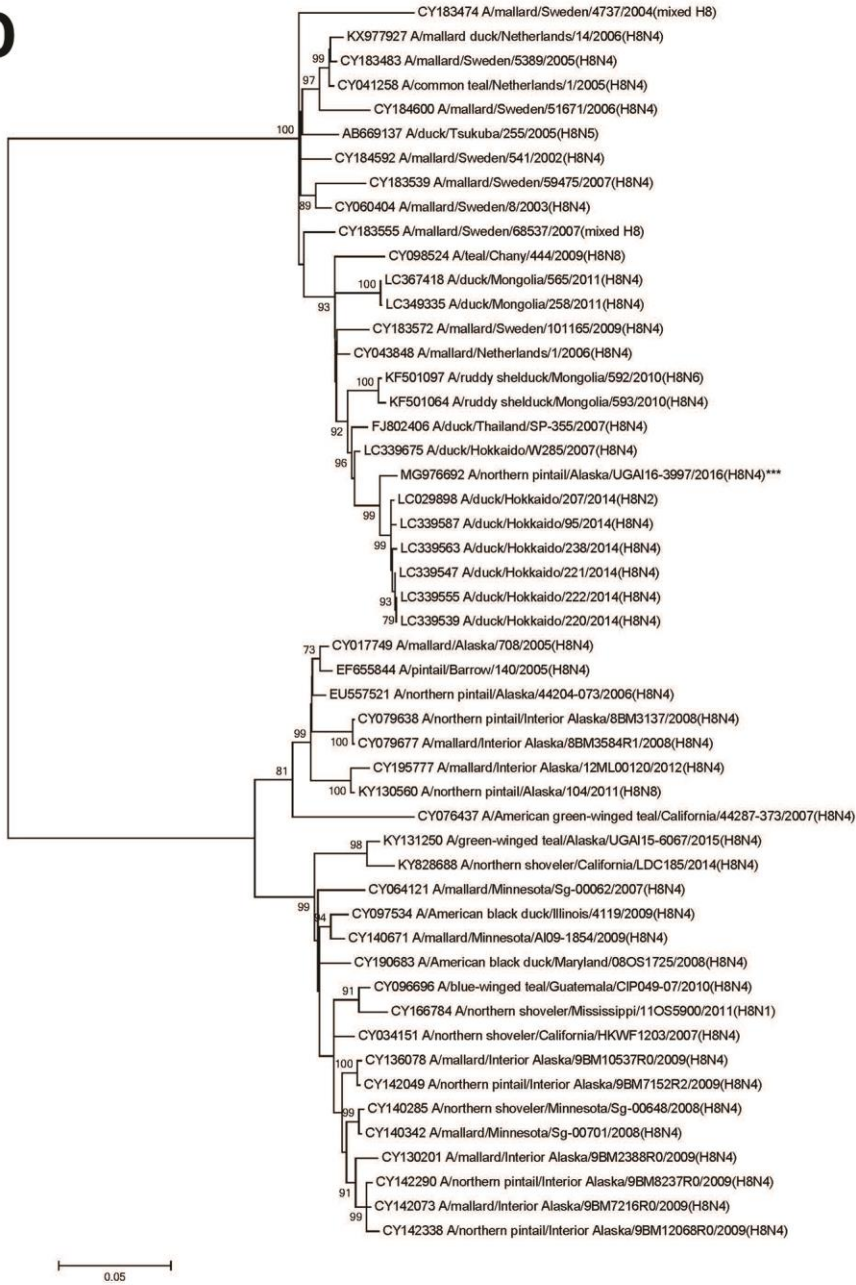


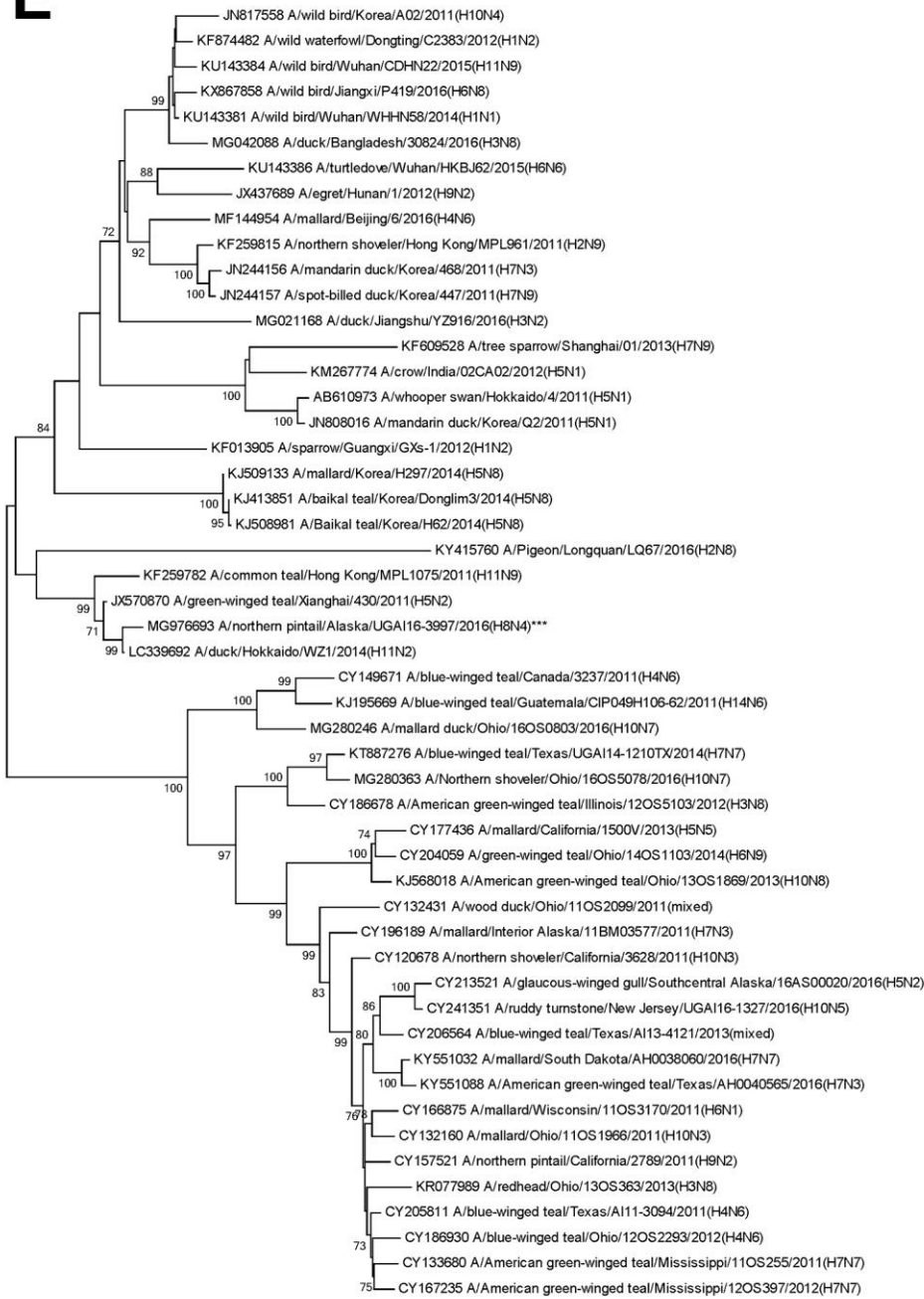
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C



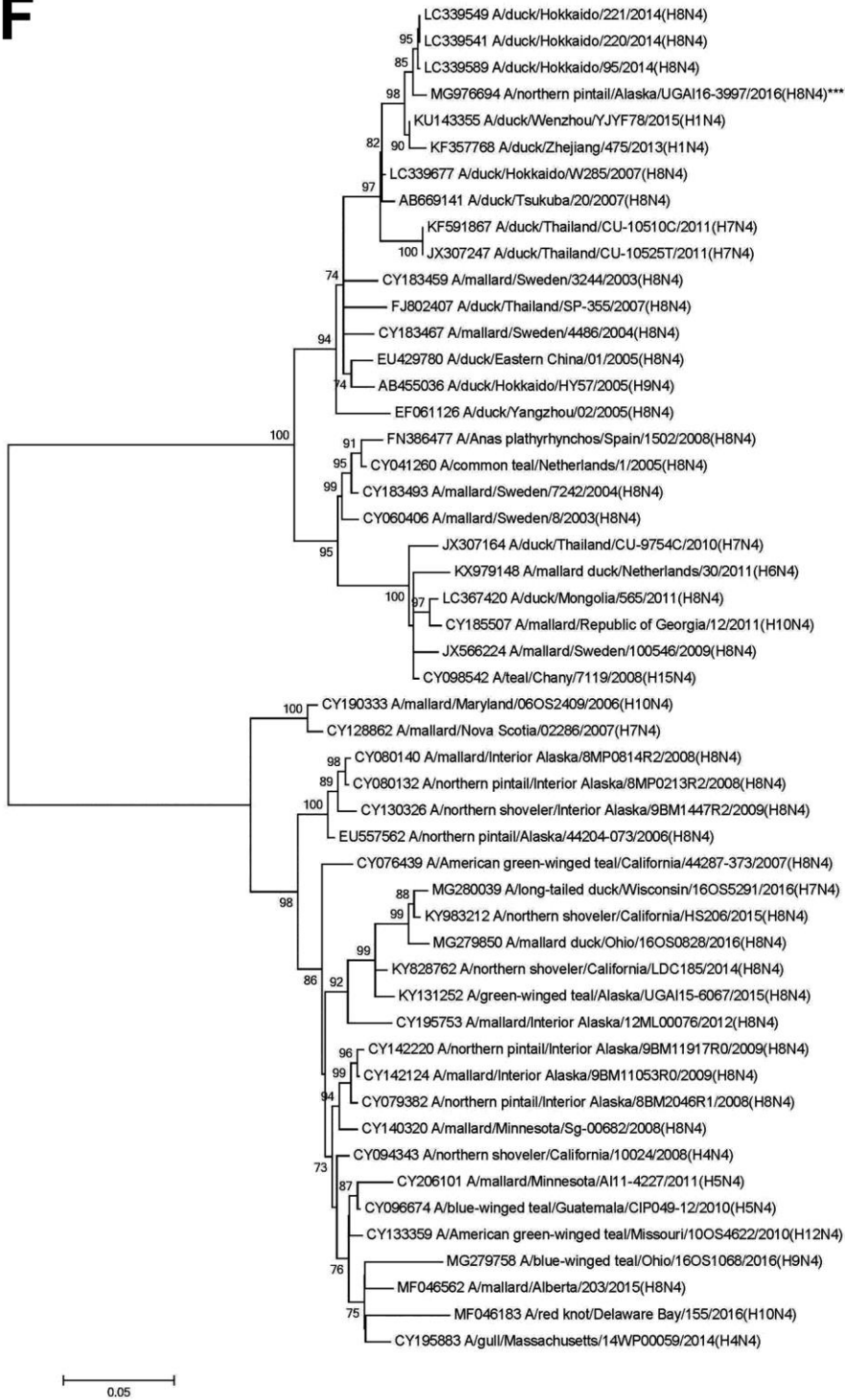
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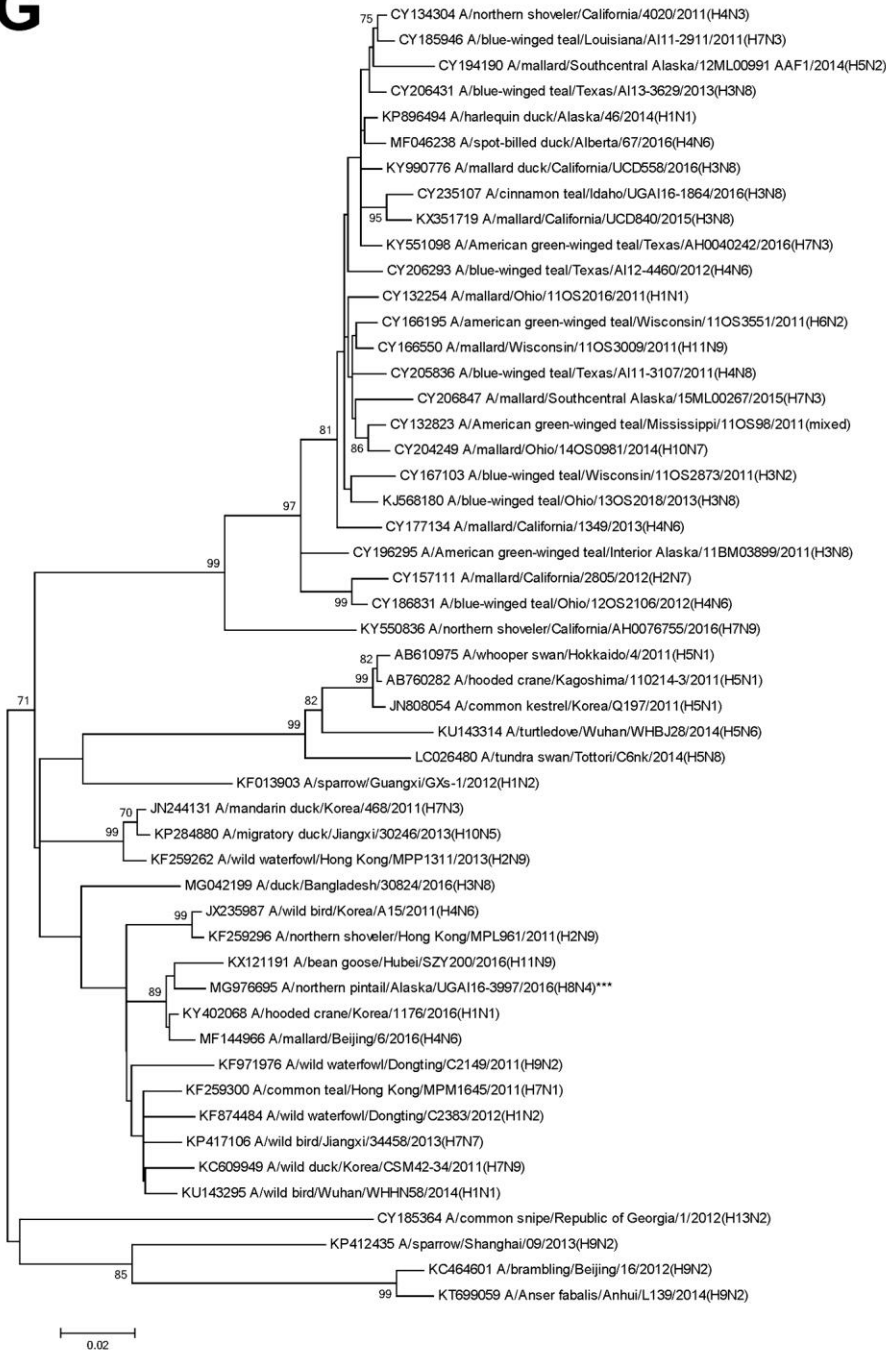


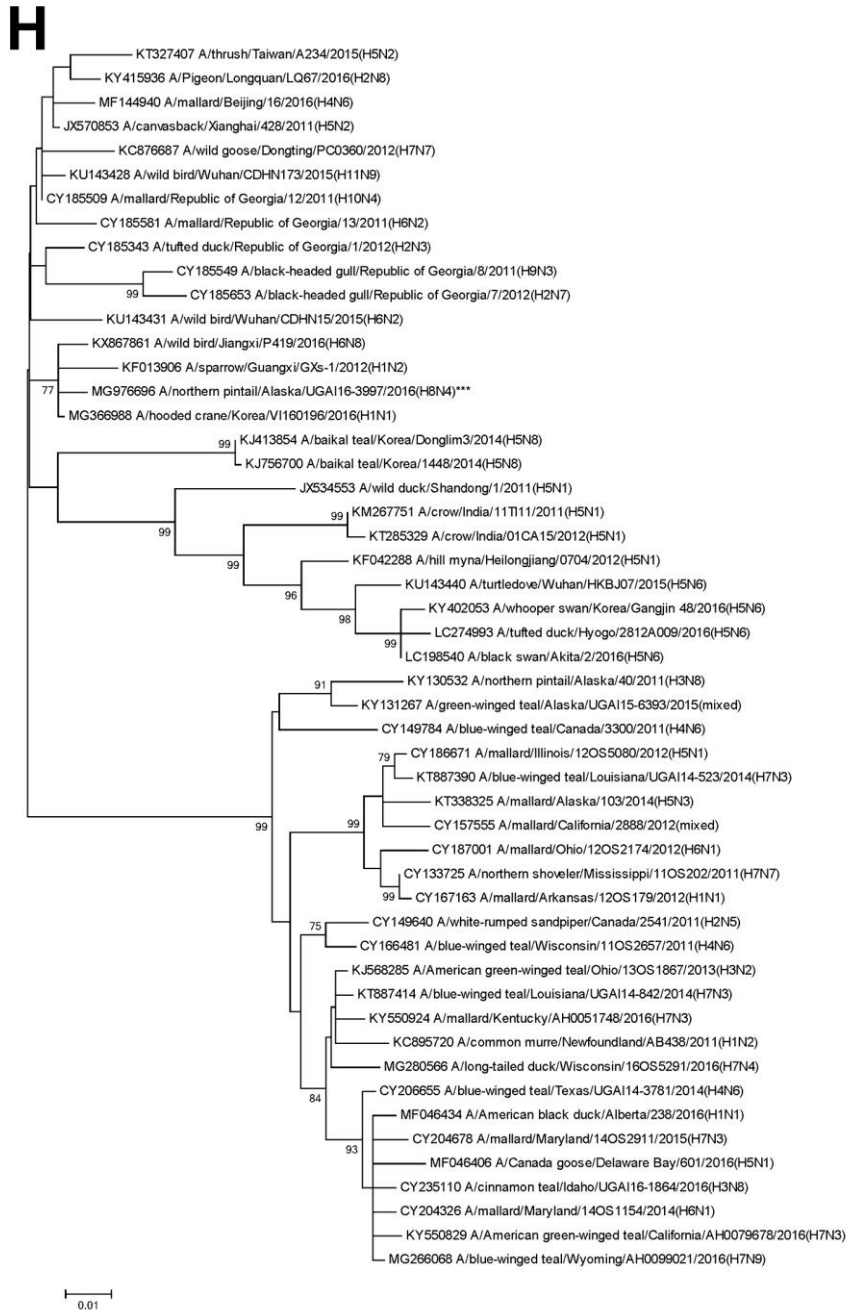
E

0.02

F



G



Technical Appendix Figure. Unrooted maximum-likelihood phylogenetic trees with complete strain names as tip labels showing inferred relationship among nucleotide sequences for the complete coding regions of the gene segments for influenza A virus strain A/northern pintail/Alaska/UGA16–3997/2016(H8N4) (indicated with 3 asterisks) and reference sequences from viruses isolated from birds in Eurasia and North America. Bootstrap support values ≥ 70 are shown. H, hemagglutinin; M, matrix; N, neuraminidase; NP, nucleoprotein; NS, nonstructural; PA, polymerase acidic; PB, polymerase basic. Scale bar indicates nucleotide substitutions per site.