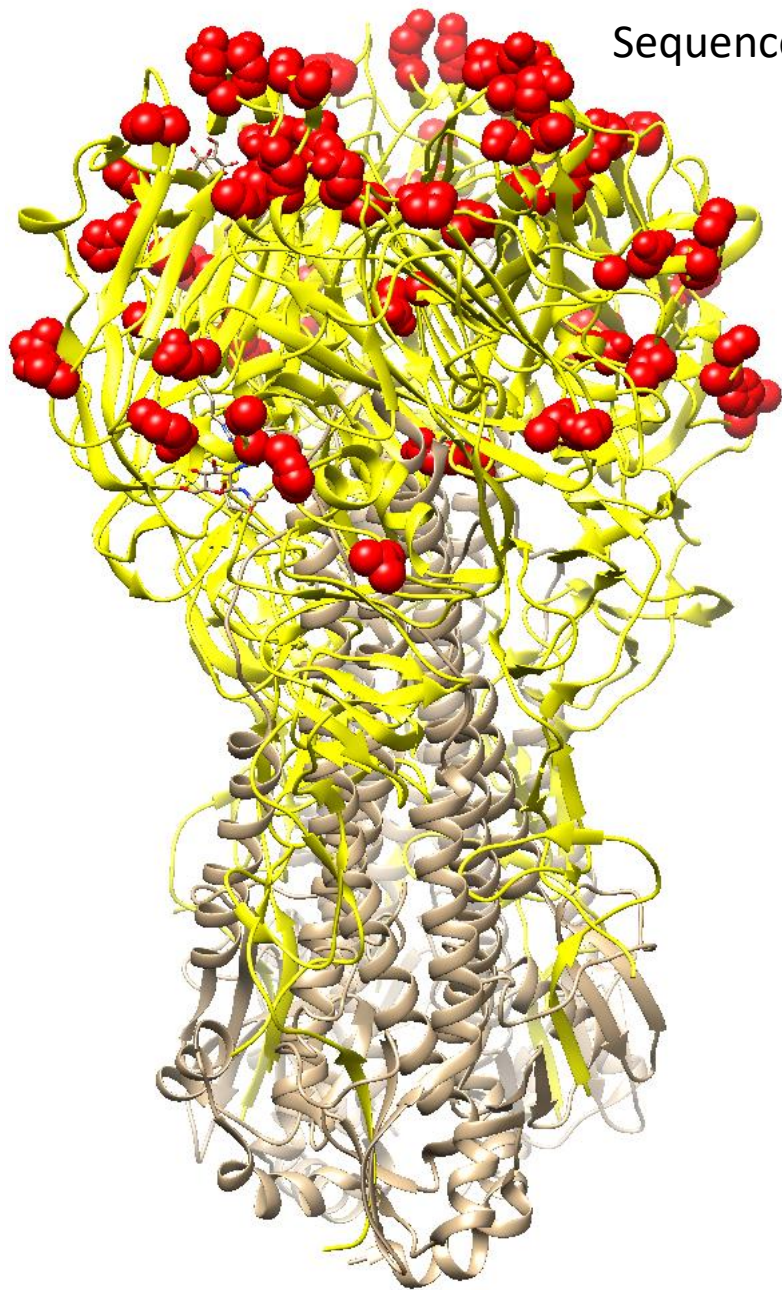
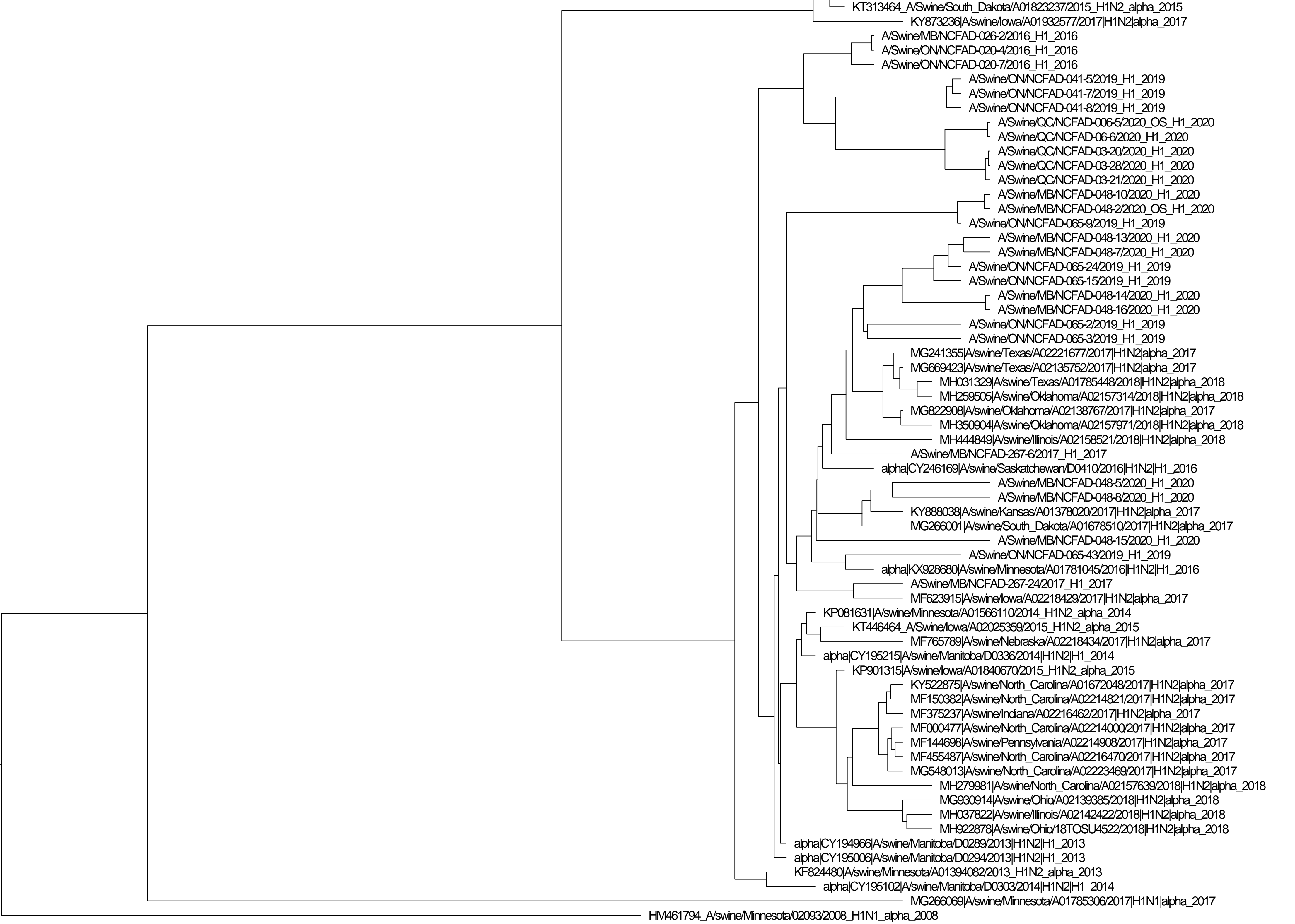


Amino acid alternations shown in SIV clade 1A.1 (alpha) H1
Sequences compared with A/Alberta/65259/2020 (H1N2v) H1



Red spheres indicate locations of amino acid
alterations at antigenic sites Ca, Cb, Sa, and Sb

Mutation frequency: 15% - 100%



KT313464_A/Swine/South_Dakota/A01823237/2015_H1N2_alpha_2015
KY873236|A/swine/Iowa/A01932577/2017|H1N2|alpha_2017

A/Swine/MB/NCFAD-026-2/2016_H1_2016
A/Swine/ON/NCFAD-020-4/2016_H1_2016
A/Swine/ON/NCFAD-020-7/2016_H1_2016

A/Swine/ON/NCFAD-041-5/2019_H1_2019
A/Swine/ON/NCFAD-041-7/2019_H1_2019
A/Swine/ON/NCFAD-041-8/2019_H1_2019

A/Swine/QC/NCFAD-006-5/2020_OS_H1_2020
A/Swine/QC/NCFAD-06-6/2020_H1_2020
A/Swine/QC/NCFAD-03-20/2020_H1_2020
A/Swine/QC/NCFAD-03-28/2020_H1_2020
A/Swine/QC/NCFAD-03-21/2020_H1_2020

A/Swine/MB/NCFAD-048-10/2020_H1_2020
A/Swine/MB/NCFAD-048-2/2020_OS_H1_2020

A/Swine/ON/NCFAD-065-9/2019_H1_2019
A/Swine/MB/NCFAD-048-13/2020_H1_2020
A/Swine/MB/NCFAD-048-7/2020_H1_2020

A/Swine/ON/NCFAD-065-24/2019_H1_2019
A/Swine/ON/NCFAD-065-15/2019_H1_2019

A/Swine/MB/NCFAD-048-14/2020_H1_2020
A/Swine/MB/NCFAD-048-16/2020_H1_2020

A/Swine/ON/NCFAD-065-2/2019_H1_2019
A/Swine/ON/NCFAD-065-3/2019_H1_2019

MG241355|A/swine/Texas/A02221677/2017|H1N2|alpha_2017
MG669423|A/swine/Texas/A02135752/2017|H1N2|alpha_2017
MH031329|A/swine/Texas/A01785448/2018|H1N2|alpha_2018
MH259505|A/swine/Oklahoma/A02157314/2018|H1N2|alpha_2018

MG822908|A/swine/Oklahoma/A02138767/2017|H1N2|alpha_2017
MH350904|A/swine/Oklahoma/A02157971/2018|H1N2|alpha_2018
MH444849|A/swine/Illinois/A02158521/2018|H1N2|alpha_2018

A/Swine/MB/NCFAD-267-6/2017_H1_2017
alpha|CY246169|A/swine/Saskatchewan/D0410/2016|H1N2|H1_2016

A/Swine/MB/NCFAD-048-5/2020_H1_2020
A/Swine/MB/NCFAD-048-8/2020_H1_2020

KY888038|A/swine/Kansas/A01378020/2017|H1N2|alpha_2017
MG266001|A/swine/South_Dakota/A01678510/2017|H1N2|alpha_2017

A/Swine/MB/NCFAD-048-15/2020_H1_2020
A/Swine/ON/NCFAD-065-43/2019_H1_2019

alpha|KX928680|A/swine/Minnesota/A01781045/2016|H1N2|H1_2016
A/Swine/MB/NCFAD-267-24/2017_H1_2017

MF623915|A/swine/Iowa/A02218429/2017|H1N2|alpha_2017

KP081631|A/swine/Minnesota/A01566110/2014_H1N2_alpha_2014
KT446464_A/Swine/Iowa/A02025359/2015_H1N2_alpha_2015
MF765789|A/swine/Nebraska/A02218434/2017|H1N2|alpha_2017

alpha|CY195215|A/swine/Manitoba/D0336/2014|H1N2|H1_2014
KP901315|A/swine/Iowa/A01840670/2015_H1N2_alpha_2015

KY522875|A/swine/North_Carolina/A01672048/2017|H1N2|alpha_2017
MF150382|A/swine/North_Carolina/A02214821/2017|H1N2|alpha_2017
MF375237|A/swine/Indiana/A02216462/2017|H1N2|alpha_2017
MF000477|A/swine/North_Carolina/A02214000/2017|H1N2|alpha_2017

MF144698|A/swine/Pennsylvania/A02214908/2017|H1N2|alpha_2017
MF455487|A/swine/North_Carolina/A02216470/2017|H1N2|alpha_2017
MG548013|A/swine/North_Carolina/A02223469/2017|H1N2|alpha_2017
MH279981|A/swine/North_Carolina/A02157639/2018|H1N2|alpha_2018

MG930914|A/swine/Ohio/A02139385/2018|H1N2|alpha_2018
MH037822|A/swine/Illinois/A02142422/2018|H1N2|alpha_2018
MH922878|A/swine/Ohio/18TOSU4522/2018|H1N2|alpha_2018

alpha|CY194966|A/swine/Manitoba/D0289/2013|H1N2|H1_2013
alpha|CY195006|A/swine/Manitoba/D0294/2013|H1N2|H1_2013
KF824480|A/swine/Minnesota/A01394082/2013_H1N2_alpha_2013

alpha|CY195102|A/swine/Manitoba/D0303/2014|H1N2|H1_2014
MG266069|A/swine/Minnesota/A01785306/2017|H1N1|alpha_2017

HM461794_A/swine/Minnesota/02093/2008_H1N1_alpha_2008

1990

1995

2000

2005

2010

2015

2020