

760 770 780 790 800
MERS-COV RSVPGMRLASIAFNHPIVDQLNSS.YFKLSIPTNFSFGVTQEXYQTIIQKVTVDCKQY
SARS-COV-2 SVASQSI IAYTMSLGAENSVAYSNN...SIAIPNFTISVTIELPVSMTKTSVDCITMY
SARS-COV STSQKSI VAYTMSLGDSS IAYSNN...TIAIPNFSISITTEVMPVSMKTSVDCITMY
OC43 ITTGYRFTNFEPFTVNSVNDLSLEPVGGLYEIQIPSEFTIGNMPEFIQTSSPKVTIDCAAF
HKU1 ISSPYRFTFEPFNVSFVNDVSVETVGLLFEIQIPNFTIAGHEPFIQTSSPKVTIDCSAF
229E YDSVSAIVTAN.....LSTPSNWTTSVOVEXLQITSKPIVVDCASTY
NL63 DNGISALITAN.....LSTPSNWTTSVOVEXLQITSTPEIVVDCASTY

810 820 830 840 850 860
MERS-COV VCGGDFEQLELREYGFCSKINQALHGANLRQDDSVRNDFASVKS.....SQSSPIIF
SARS-COV-2 ICGDSTEC SNLTLQYGSFCTQLNRALTGIAVEQDKNTQEVFAQVKS.....IYKTEPIK
SARS-COV ICGDSTEC ANLTLQYGSFCTQLNRALSGIAAEQDRNRTREVFVAQVKS.....MYKTEPIK
OC43 VCGDYAAKCLQLEVEYGFCDNINALETEVNELELDTIQLVANS LMNGVTLSTKLKDVGNF
HKU1 VCSNYAAVCHDLESEYGFCDNINALETEVNELELDTIQLVANS LMNGVTLSTKLKDVGNF
229E VCSNYAAVCHDLESEYGFCDNINALETEVNELELDTIQLVANS LMNGVTLSTKLKDVGNF
NL63 VCSNYAAVCHDLESEYGFCDNINALETEVNELELDTIQLVANS LMNGVTLSTKLKDVGNF

P/887-904

870 880 890 900 910 920
MERS-COV GFGDFENLTLLEFPVSI STGSRARSALIEDLDFKVTIADPG.YMQGYDDCMQGGPASARD
SARS-COV-2 DFGDFENLTLLEFPVSI STGSRARSALIEDLDFKVTIADPG.YMQGYDDCMQGGPASARD
SARS-COV YFGDFENLTLLEFPVSI STGSRARSALIEDLDFKVTIADPG.YMQGYDDCMQGGPASARD
OC43 NVDDINRFPVVLGCLGSECSKSSRSALIEDLDFKVTIADPG.YMQGYDDCMQGGPASARD
HKU1 DVDNIDFKSLLGCLGSECSKSSRSALIEDLDFKVTIADPG.YMQGYDDCMQGGPASARD
229E SFGDYNLSSVIFSLPRSGSRVAGRSALIEDLDFKVTIADPG.YMQGYDDCMQGGPASARD
NL63 SFGDYNLSSVIFSLPRSGSRVAGRSALIEDLDFKVTIADPG.YMQGYDDCMQGGPASARD

P/920-938

930 940 950 960 970 980
MERS-COV LICAOYVAGYKVLPLMVDNMEAAVYSSLLGSIAGVGNWAGLSSFAAIPFAQSI FVRRNG
SARS-COV-2 LICAOYVAGYKVLPLMVDNMEAAVYSSLLGSIAGVGNWAGLSSFAAIPFAQSI FVRRNG
SARS-COV LICAOYVAGYKVLPLMVDNMEAAVYSSLLGSIAGVGNWAGLSSFAAIPFAQSI FVRRNG
OC43 LICAOYVAGYKVLPLMVDNMEAAVYSSLLGSIAGVGNWAGLSSFAAIPFAQSI FVRRNG
HKU1 LICAOYVAGYKVLPLMVDNMEAAVYSSLLGSIAGVGNWAGLSSFAAIPFAQSI FVRRNG
229E LICAOYVAGYKVLPLMVDNMEAAVYSSLLGSIAGVGNWAGLSSFAAIPFAQSI FVRRNG
NL63 LICAOYVAGYKVLPLMVDNMEAAVYSSLLGSIAGVGNWAGLSSFAAIPFAQSI FVRRNG

P/978-1002

990 1000 1010 1020
MERS-COV VGITQNVLSENOQLIANEFNKALGAMQGTFT.....TTNEAFQKVDVAVNN
SARS-COV-2 IGVTVNVLSENOQLIANEFNKALGAMQGTFT.....TTNEAFQKVDVAVNN
SARS-COV IGVTVNVLSENOQLIANEFNKALGAMQGTFT.....TTNEAFQKVDVAVNN
OC43 LGVTMDVLENOQLIANEFNKALGAMQGTFT.....TTNEAFQKVDVAVNN
HKU1 LGVTMDVLENOQLIANEFNKALGAMQGTFT.....TTNEAFQKVDVAVNN
229E VALQTDVLENOQLIANEFNKALGAMQGTFT.....TTNEAFQKVDVAVNN
NL63 VALQTDVLENOQLIANEFNKALGAMQGTFT.....TTNEAFQKVDVAVNN

P/1030-1048

P/1044-1062

1030 1040 1050 1060 1070 1080
MERS-COV NAAQLNKLASELSSNTFGAISASIGDIQRLLDVEQDAQDRLINGRLLTALNAFVAQOIVR
SARS-COV-2 NAAQLNKLASELSSNTFGAISASIGDIQRLLDVEQDAQDRLINGRLLTALNAFVAQOIVR
SARS-COV NAAQLNKLASELSSNTFGAISASIGDIQRLLDVEQDAQDRLINGRLLTALNAFVAQOIVR
OC43 NAAQLNKLASELSSNTFGAISASIGDIQRLLDVEQDAQDRLINGRLLTALNAFVAQOIVR
HKU1 NAAQLNKLASELSSNTFGAISASIGDIQRLLDVEQDAQDRLINGRLLTALNAFVAQOIVR
229E NAAQLNKLASELSSNTFGAISASIGDIQRLLDVEQDAQDRLINGRLLTALNAFVAQOIVR
NL63 NAAQLNKLASELSSNTFGAISASIGDIQRLLDVEQDAQDRLINGRLLTALNAFVAQOIVR

P/1096-1120

1090 1100 1110 1120 1130 1140
MERS-COV SESAAALSAQAARDKVNCEVKAQSRSGFCGQGTHTVSEFVFNAPNGLYFMHVGYYPNSHIE
SARS-COV-2 AAERIRASANAATKMSCEVLDGQSKRVDFCGKGYHLMSPQAPAGHVVEFHVTVYVPAQENK
SARS-COV AAERIRASANAATKMSCEVLDGQSKRVDFCGKGYHLMSPQAPAGHVVEFHVTVYVPAQENK
OC43 STLKVFSAQAAMEKVNCEVKSQSSRINFCCGNGNHLISLVQNAFYGLVEIFHFNYVPTKYVT
HKU1 IITLKAGASRAIEKVNCEVKSQSSRINFCCGNGNHLISLVQNAFYGLVEIFHFNYVPTKYVT
229E YTEVRASRQAQQKVNCEVKSQSSRINFCCGNGNHLISLVQNAFYGLVEIFHFNYVPTKYVT
NL63 YTEVRSSRRLAQQKVNCEVKSQSSRINFCCGNGNHLISLVQNAFYGLVEIFHFNYVPTKYVT

1150 1160 1170 1180 1190 1200
MERS-COV VVSAYGLCDANPTNCTAPVNGYFKTNTRIVDEWSYTGSSFYAPPEPITSLNITKYVAPQC
SARS-COV-2 FTTAPAIHDG.KAHFPREG..VFSNGTH.....WFVTRQNFYEPQIITTDNTFVSGNC
SARS-COV FTTAPAIHDG.KAHFPREG..VFSNGTH.....WFVTRQNFYEPQIITTDNTFVSGNC
OC43 AKVSPGLCIAENRGIAPKSG..YFVNVTNT.....WMTGSSYYYPPEPITTDNTFVSGNC
HKU1 VLVSPGLCLSDGRGIAPKSG..YFVNVTNT.....WMTGSSYYYPPEPITTDNTFVSGNC
229E VEAWSPGLCLSDGRGIAPKSG..YFVNVTNT.....WMTGSSYYYPPEPITTDNTFVSGNC
NL63 VKAWSPGLCLSDGRGIAPKSG..YFVNVTNT.....WMTGSSYYYPPEPITTDNTFVSGNC

P/1229-1243

1210 1220 1230 1240 1250 1260
MERS-COV VTYQNI STNLP PPL LGNSTGIDDFELDEFKKNVSTISIPNFGSLTQINTL LLDLTYEMLS
SARS-COV-2 DVVIGINNTVYDPLQPELDSFKELDKYFKNHTSPDVLGDGISGINASVVNIQKELDR
SARS-COV DVVIGINNTVYDPLQPELDSFKELDKYFKNHTSPDVLGDGISGINASVVNIQKELDR
OC43 AVNYTKAPYVMLNTP.NLSDFKELDKYFKNHTSPDVLGDGISGINASVVNIQKELDR
HKU1 SVNFTKAPFIYLNNSIP.NLSDFKELDKYFKNHTSPDVLGDGISGINASVVNIQKELDR
229E NVTFVNI SRSELQTI VE.EYIDVKNKLOELSYKLPNIYVDPDLVVEQYNQITLNLSTBIIST
NL63 NVTFVNI SRSELQTI VE.EYIDVKNKLOELSYKLPNIYVDPDLVVEQYNQITLNLSTBIIST

1270 1280 1290 1300 1310
MERS-COV LQ.....VVKALNESYTDLKEELGNYTYNKKPWWIWLGFAGLVALALCV
SARS-COV-2 LN.....EVAKNLESLELDLQELGKYEQYIKKPPWWIWLGFAGLVAIVMT
SARS-COV LN.....EVAKNLESLELDLQELGKYEQYIKKPPWWIWLGFAGLVAIVMT
OC43 LQ.....EAIKVLNHSYINLKDIDGTYEYVKKPWWIWLGLIAGVAMLVLL
HKU1 IQ.....ESIKLSNSSFINKREIGTYEYVKKPWWIWLGLIAGVAMLVLL
229E LENKSAELNYTVKQLQTLIDNINSLVLDLKWLNRYEYVKKPWWIWLGLIAGVAMLVLL
NL63 LEAKTASLFQTVVLELQGLIDQINSLVLDLKWLNRYEYVKKPWWIWLGLIAGVAMLVLL

1320 1330 1340 1350
MERS-COV FFLCCFTGCGSNMCMGKLCNRCDRYEEYDLEPHKVVH...
SARS-COV-2 IMLCCTGCGSCSLKGCSCGSCCFDEDDSEFVVKGVKLYHT
SARS-COV ILLCCFTGCGSCSLKGCSCGSCCFDEDDSEFVVKGVKLYHT
OC43 FFLCCFTGCGSCSCFCKCGG..CCDDYTGQELVICTSHDD..
HKU1 FFLCCFTGCGSCSACFSKCHN..CCDEYGGHNDFFVYKASHDD..
229E LLCCCTGCGSCCFSCFASIKGCES..TKLPYDVEKIKHIQ
NL63 VFLCCFTGCGSCCNCLTSSMRGCDGCGSTKLPYVEFKVVHVO