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Supplemental Information

The immunodominant and neutralization linear epitopes for SARS-CoV-2

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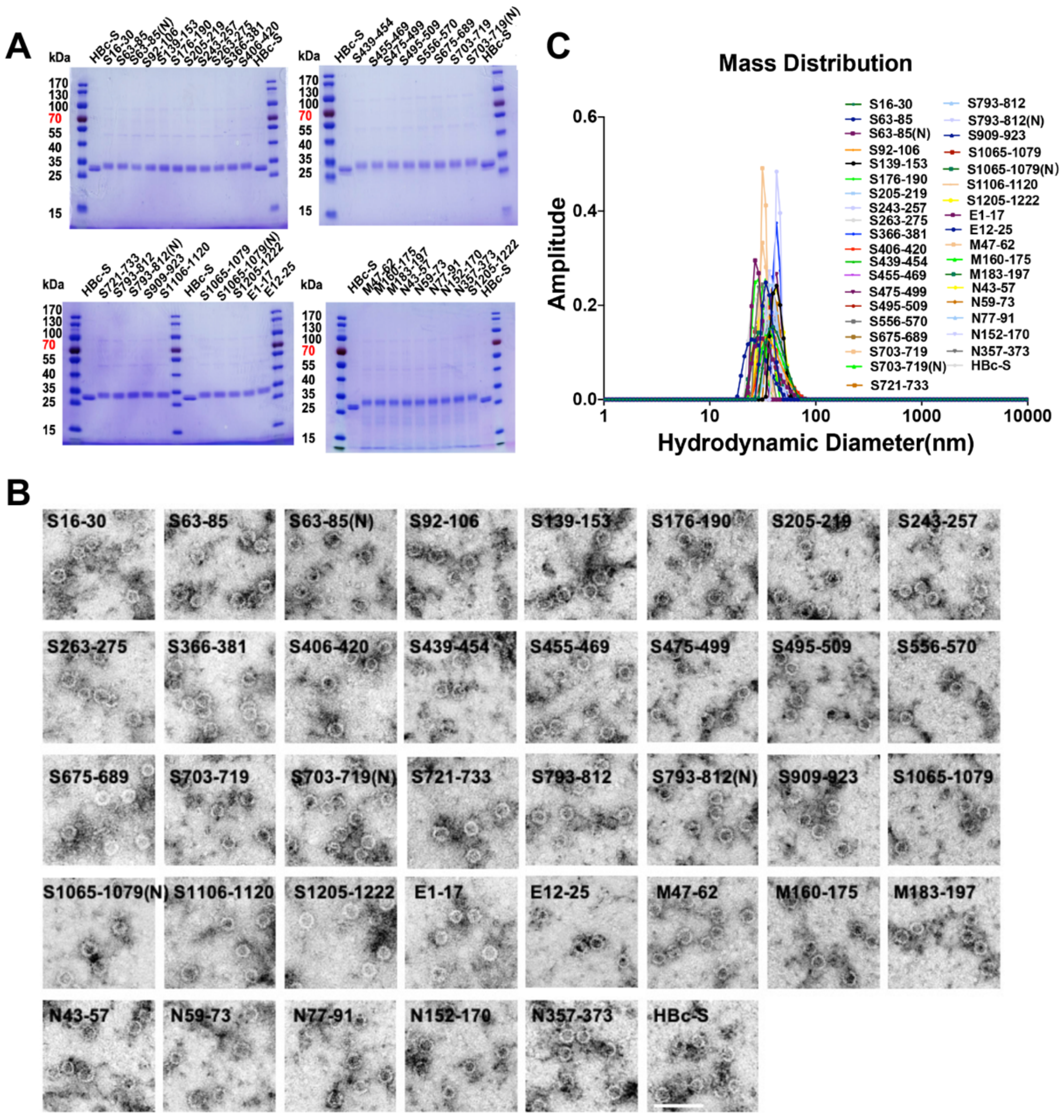

Figure S1. Preparation of HBc-S VLPs displayed with the epitopes. Related to Figure 1. (A) SDS-PAGE analysis of the conjugation of HBc-S with epitope peptides. (B) The morphology of HBc-S-P VLPs. HBc-S-P VLPs were imaged by Hitachi TEM at 80 KV at 40,000× magnification, the scale bar is 200 nm. (C) The representative hydrodynamic diameter of HBc-S-P VLPs.

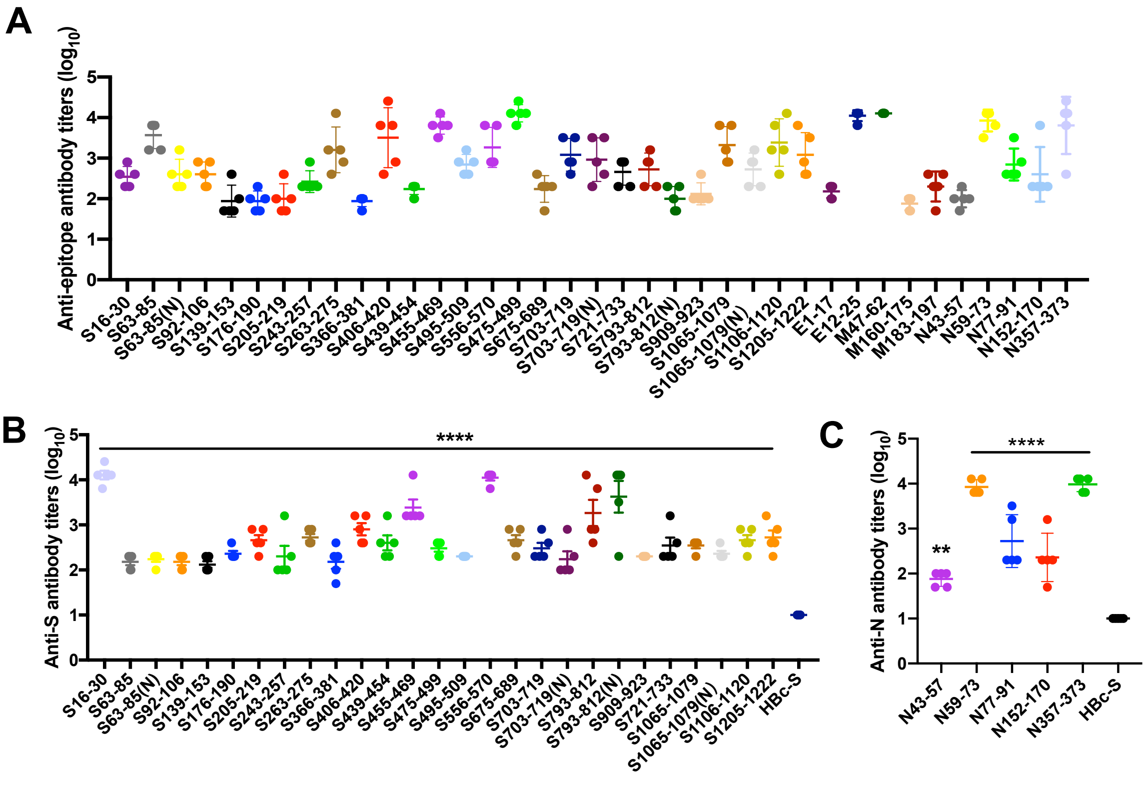

Figure S2. Epitope conjugated on HBc-S VLPs induced high antibody titers against epitope peptides and S, N proteins at 10 days after the second immunization. Related to Figure 1.

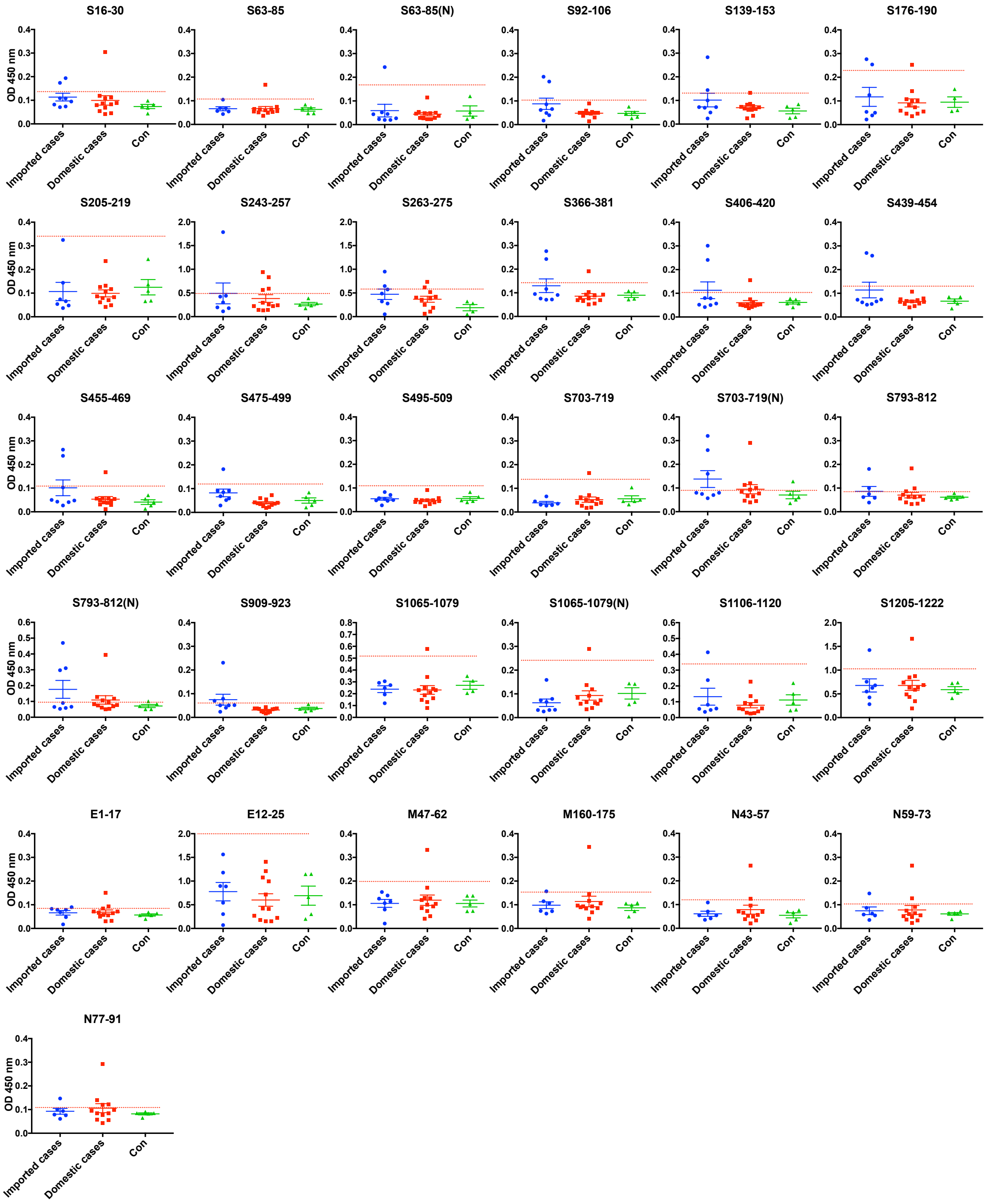

Figure S3. The non-immunodominant epitopes against S, E, M, N in early convalescent sera from COVID-19 patients. Related to Figure 2.

Table S1. Predicted epitope peptides. Related to Figure 1.

Location	Sequence	Homology
S16-30	VNLTTRTQLPPAYTN	33.30%
S63-85	TWFHAIHVSGTNGTKRFDNPVLP	60.90%
S63-85(N)	TWFHAIHVSGTNGTKRFDN(GlcNAc)PVLP	60.90%
S92-106	FASTEKSNIIRGWIF	100%
S139-153	PFLGVYYHKNNKSWM	26.70%
S176-190	LMDLEGKQGNFKNLR	73.30%
S205-219	SKHTPINLVRDLPQG	73.30%
S243-257	ALHRSYLTPGDSSSG	13.30%
S263-275	AAYYVGYLQPRTF	92.30%
S366-381	SVLYNSASFSTFKCYG	93.70%
S406-420	EVRQIAPGQTGKIAD	93.30%
S439-454	NNLDSKVGGNYNYLYR	62.50%
S455-469	LFRKSNLKPFERDIS	86.70%
S475-499	AGSTPCNGVEGFNCYFPLQSYGFQP	48%
S495-509	YGFQPTNGVGYQPYR	80%
S556-570	NKKFLPFQQFGRDIA	86.70%
S675-689	QTQTNSPRRARSVAS	40%
S703-719	NSVAYSNNSIAIPTNFT	94.10%
S703-719(N)	NSVAYSNNSIAIPTN(GlcNAc)FT	94.10%
S721-733	SVTTEILPVSMTK	100%
S793-812	PIKDFGGFNFSQILPDPSKP	85%
S793-812(N)	PIKDFGGFN(GlcNAc)FSQILPDPSKP	85%
S909-923	IGVTQNVLYENQKLI	93.30%
S1065-1079	VTYVPAQEKNFTTAP	100%
S1065-1079(N)	VTYVPAQEKN(GlcNAc)FTTAP	100%
S1106-1120	QRNFYEPQIITTDNT	93.30%
S1205-1222	KYEQYIKWPWYIWLGFIA	100%
E1-17	MYSFVSEETGTLIVNSV	100%
E12-25	LIVNSVLLFLAFVV	100%
M47-62	YIIKLIFLWLLWPVTL	100%
M160-175	DIKDLPKEITVATSRT	100%
M183-197	ASQRVAGDSGFAAYS	86.70%
N43-57	QGLPNNTASWFTALT	100%
N59-73	HGKEDLKFPRGQGVP	100%
N77-91	NSSPDDQIGYYRRAT	93.30%
N152-170	ANNAAIVLQLPQGTTLPKG	89.40%
N357-373	IDAYKTFPPTEPKKDKK	100%

Table S2. The Hydrodynamic Diameter and PDI of HBc-S-P VLPs. Related to Figure 1.

Sample	S16-30	S63-85	S63-85(N)	S92-106	S139-153	S176-190	S205-219	S243-257	S263-275	S366-381	S406-420	S439-454	S455-469
PDI	0.08	0.07	0.18	0.19	0.04	0.06	0.05	0.01	0.04	0.01	0.01	0.01	0.06
Hydrodynamic Diameter(nm)	48.0±13.0	37.3±10.0	39.8±13.0	45.5±14.5	45.0±8.5	45.1±10.7	44.7±10.2	46.7±4.7	44.2±8.7	45.9±12.2	45.7±3.4	44.8±10.8	45.4±3.8
Sample	**S475-499**	**S495-509**	**S556-570**	**S675-689**	**S703-719**	**S703-719(N)**	**S721-733**	**S793-812**	**S793-812(N)**	**S909-923**	**S1065-1079**	**S1065-1079(N)**	**S1106-1120**
PDI	0.02	0.21	0.04	0.03	0.10	0.09	0.03	0.06	0.14	0.04	0.06	0.04	0.06
Hydrodynamic Diameter(nm)	44.8±9.1	45.5±10.8	46.6±8.8	45.6±8.3	34.9±11.2	35.4±11.0	45.2±7.9	37.9±9.5	41.6±15.3	44.8±9.0	37.2±8.8	37.9±9.5	48.0±12.1
Sample	**S1205-1222**	**E1-17**	**E12-25**	**M47-62**	**M160-175**	**M183-197**	**N43-57**	**N59-73**	**N77-91**	**N152-170**	**N357-373**	**HBc-S**	
PDI	0.06	0.12	0.08	0.15	0.01	0.02	0.10	0.14	0.01	0.04	0.04	0.06	
Hydrodynamic Diameter(nm)	45.1±11.4	35.4±13.1	34.1±9.3	48.0±10.5	37.1±3.7	44.3±6.1	39.4±12.6	39.3±7.4	44.7±4.7	43.8±6.0	36.7±7.4	36.7±5.2	

Table S3. Characteristics of epitopes. Related to Figure 1-3.

Epitopes	S protein		N protein	M protein	E protein
	non-glycosylation	Glycosylation			
Number	23	4	5	3	2
Conserved (>80% homology)	S92-106, S263-275, S366-381, S406-420, S455-469, S495-509, S556-570, S703-719, S721-733, S793-812, S909-923, S1065-1079, S1106-1120, S1205-1222	S703-719(N), S793-812(N), S1065-1079(N)	N43-57, N59-73, N77-91, N152-170, N357-373	M47-62, M160-175, M183-197	E12-25, E55-69
High immunogenicity (antibody titer>10^4)	S16-30, S205-219, S455-469, S475-499, S556-570, S721-733, S793-812, S1106-1120, S1205-1222	S793-812(N)	N59-73, N353-373	M47-62	E12-25
Immunodominant					
Imported cases*	S675-689, S721-733	None	N152-170	None	None
Domestic cases*	S556-570	None	N357-373, N152-170	M183-197	None
Neutralizing					
D614 SARS-CoV-2	S16-30, S92-106, S139-153, S243-275, S406-420, S439-454, S455-469, S475-499, S556-570, S909-923	S793-812(N)	NT[a]	NT	NT
G614 SARS-CoV-2	S63-85, S92-106, S139-153, S406-420, S439-454, S455-469, S475-499, S495-509 , S675-689,S703-719, S793-812, S909-923, S1065-1079, S1106-1120	S703-719(N), S793-812(N), S1065-1079(N)	NT	NT	NT

***Imported (Europe) cases infected SARS-CoV-2 in early April, 2020 and domestic (China) cases in early February, 2020**

[a] NT represents not tested

S Protein

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SARS-CoV        MFIFLLFLTLTSGSDLDRCTTFDDVQAPNYTQHTSSMRGVYYPDEIFRSDTLYLTQDLFL
SARS-CoV-2      MFVFLVLLPLVSSQCVNLTT--RTQLPPAY--TNSFTRGVYYPDKVFRSSVLHSTQDLFL
RaTG13          MFVFLVLLPLVSSQCVNLTT--RTQLPPAY--TNSSTRGVYYPDKVFRSSVLHLTQDLFL
                **:**::* *.*.. ::  *       * *   .*  *******::***..*: ******

SARS-CoV        PFYSNVTGFHTIN-------HTFDNPVIPFKDGIYFAATEKSNVVRGWVFGSTMNNKSQS
SARS-CoV-2      PFFSNVTWFHAIHVSGTNGTKRFDNPVLPFNDGVYFASTEKSNIIRGWIFGTTLDSKTQS
RaTG13          PFFSNVTWFHAIHVSGTNGIKRFDNPVLPFNDGVYFASTEKSNIIRGWIFGTTLDSKTQS
                **:**** **:*:       : *****:**:**:***:*****::***:**:*::.*:**

SARS-CoV        VIIINNSTNVVIRACNFELCDNPFFAVSKPMGT----QTHTMIFDNAFNCTFEYISDAFS
SARS-CoV-2      LLIVNNATNVVIKVCEFQFCNDPFLGVYYHKNNKSWMESEFRVYSSANNCTFEYVSQPFL
RaTG13          LLIVNNATNVVIKVCEFQFCNDPFLGVYYHKNNKSWMESEFRVYSSANNCTFEYVSQPFL
                ::*:**:*****:.*:*::*::**:.*    ..    ::.  ::..* ******:*: *

SARS-CoV        LDVSEKSGNFKHLREFVFKNKDGFLYVYKGYQPIDVVRDLPSGFNTLKPIFKLPLGINIT
SARS-CoV-2      MDLEGKQGNFKNLREFVFKNIDGYFKIYSKHTPINLVRDLPQGFSALEPLVDLPIGINIT
RaTG13          MDLEGKQGNFKNLREFVFKNIDGYFKIYSKHTPINLVRDLPPGFSALEPLVDLPIGINIT
                :*:. *.****:******** **:: :*. : **::***** **.:*:*:..**:*****

SARS-CoV        NFRAILTAFL------PAQDTWGTSAAAYFVGYLKPTTFMLKYDENGTITDAVDCSQNPL
SARS-CoV-2      RFQTLLALHRSYLTPGDSSSGWTAGAAAYYVGYLQPRTFLLKYNENGTITDAVDCALDPL
RaTG13          RFQTLLALHRSYLTPGDSSSGWTAGAAAYYVGYLQPRTFLLKYNENGTITDAVDCALDPL
                .*:::*: .        :.. * :.****:****:* **:***:***********: :**

SARS-CoV        AELKCSVKSFEIDKGIYQTSNFRVVPSRDVVRFPNITNLCPFGEVFNATKFPSVYAWERK
SARS-CoV-2      SETKCTLKSFTVEKGIYQTSNFRVQPTESIVRFPNITNLCPFGEVFNATRFASVYAWNRK
RaTG13          SETKCTLKSFTVEKGIYQTSNFRVQPTDSIVRFPNITNLCPFGEVFNATTFASVYAWNRK
                :* **::*** ::*********** *: .:******************* * *****:**

SARS-CoV        RISNCVADYSVLYNSTFFSTFKCYGVSATKLNDLCFSNVYADSFVVKGDDVRQIAPGQTG
SARS-CoV-2      RISNCVADYSVLYNSASFSTFKCYGVSPTKLNDLCFTNVYADSFVIRGDEVRQIAPGQTG
RaTG13          RISNCVADYSVLYNSTSFSTFKCYGVSPTKLNDLCFTNVYADSFVITGDEVRQIAPGQTG
                ***************: ********** ********:********: **:**********

SARS-CoV        VIADYNYKLPDDFMGCVLAWNTRNIDATSTGNYNYKYRYLRHGKLRPFERDISNVPFSPD
SARS-CoV-2      KIADYNYKLPDDFTGCVIAWNSNNLDSKVGGNYNYLYRLFRKSNLKPFERDISTEIYQAG
RaTG13          KIADYNYKLPDDFTGCVIAWNSKHIDAKEGGNFNYLYRLFRKANLKPFERDISTEIYQAG
                 ************ ***:***:.::*:.  **:** ** :*:.:*:*******.  :. .

SARS-CoV        GKPCTP-PALNCYWPLNDYGFYTTTGIGYQPYRVVVLSYELLNAPATVCGPKLSTDLIKN
SARS-CoV-2      STPCNGVEGFNCYFPLQSYGFQPTNGVGYQPYRVVVLSFELLHAPATVCGPKKSTNLVKN
RaTG13          SKPCNGQTGLNCYYPLYRYGFYPTDGVGHQPYRVVVLSFELLNAPATVCGPKKSTNLVKN
                ..**.   .:***:**  ***  * *:*:*********:***:********* **:*:**

SARS-CoV        QCVNFNFNGLTGTGVLTPSSKRFQPFQQFGRDVSDFTDSVRDPKTSEILDISPCSFGGVS
SARS-CoV-2      KCVNFNFNGLTGTGVLTESNKKFLPFQQFGRDIADTTDAVRDPQTLEILDITPCSFGGVS
RaTG13          KCVNFNFNGLTGTGVLTESNKKFLPFQQFGRDIADTTDAVRDPQTLEILDITPCSFGGVS
                :**************** *.*:* ********::* **:****:* *****:********

SARS-CoV        VITPGTNASSEVAVLYQDVNCTDVSTAIHADQLTPAWRIYSTGNNVFQTQAGCLIGAEHV
SARS-CoV-2      VITPGTNTSNQVAVLYQDVNCTEVPVAIHADQLTPTWRVYSTGSNVFQTRAGCLIGAEHV
RaTG13          VITPGTNASNQVAVLYQDVNCTEVPVAIHADQLTPTWRVYSTGSNVFQTRAGCLIGAEHV
                *******:*.:***********:* .*********:**:****.*****:**********

SARS-CoV        DTSYECDIPIGAGICASYHTVSL----LRSTSQKSIVAYTMSLGADSSIAYSNNTIAIPT
SARS-CoV-2      NNSYECDIPIGAGICASYQTQTNSPRRARSVASQSIIAYTMSLGAENSVAYSNNSIAIPT
RaTG13          NNSYECDIPIGAGICASYQTQTNS----RSVASQSIIAYTMSLGAENSVAYSNNSIAIPT
                :.****************:* :      **.:.:**:********:.*:*****:*****

SARS-CoV        NFSISITTEVMPVSMAKTSVDCNMYICGDSTECANLLLQYGSFCTQLNRALSGIAAEQDR
SARS-CoV-2      NFTISVTTEILPVSMTKTSVDCTMYICGDSTECSNLLLQYGSFCTQLNRALTGIAVEQDK
RaTG13          NFTISVTTEILPVSMTKTSVDCTMYICGDSTECSNLLLQYGSFCTQLNRALTGIAVEQDK
                **:**:***::****:******.**********:*****************:***.***:

SARS-CoV        NTREVFAQVKQMYKTPTLKDFGGFNFSQILPDPLKSTKRSFIEDLLFNKVTLADAGFMKQ
SARS-CoV-2      NTQEVFAQVKQIYKTPPIKDFGGFNFSQILPDPSKPSKRSFIEDLLFNKVTLADAGFIKQ
RaTG13          NTQEVFAQVKQIYKTPPIKDFGGFNFSQILPDPSKPSKRSFIEDLLFNKVTLADAGFIKQ
                **:********:**** :*************** * :********************:**
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SARS-CoV        YGECLGDINARDLICAQKFNGLTVLPPLLTDDMIAAYTAALVSGTATAGWTFGAGAALQI
SARS-CoV-2      YGDCLGDIAARDLICAQKFNGLTVLPPLLTDEMIAQYTSALLAGTITSGWTFGAGAALQI
RaTG13          YGDCLGDIAARDLICAQKFNGLTVLPPLLTDEMIAQYTSALLAGTITSGWTFGAGAALQI
                **:***** **********************:*** **:**::** *:************

SARS-CoV        PFAMQMAYRFNGIGVTQNVLYENQKQIANQFNKAISQIQESLTTTSTALGKLQDVVNQNA
SARS-CoV-2      PFAMQMAYRFNGIGVTQNVLYENQKLIANQFNSAIGKIQDSLSSTASALGKLQDVVNQNA
RaTG13          PFAMQMAYRFNGIGVTQNVLYENQKLIANQFNSAIGKIQDSLSSTASALGKLQDVVNQNA
                ************************* ******.**.:**:**::*::*************

SARS-CoV        QALNTLVKQLSSNFGAISSVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYVTQQLIRAA
SARS-CoV-2      QALNTLVKQLSSNFGAISSVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYVTQQLIRAA
RaTG13          QALNTLVKQLSSNFGAISSVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYVTQQLIRAA
                ************************************************************

SARS-CoV        EIRASANLAATKMSECVLGQSKRVDFCGKGYHLMSFPQAAPHGVVFLHVTYVPSQERNFT
SARS-CoV-2      EIRASANLAATKMSECVLGQSKRVDFCGKGYHLMSFPQSAPHGVVFLHVTYVPAQEKNFT
RaTG13          EIRASANLAATKMSECVLGQSKRVDFCGKGYHLMSFPQSAPHGVVFLHVTYVPAQEKNFT
                **************************************:**************:**:***

SARS-CoV        TAPAICHEGKAYFPREGVFVFNGTSWFITQRNFFSPQIITTDNTFVSGNCDVVIGIINNT
SARS-CoV-2      TAPAICHDGKAHFPREGVFVSNGTHWFVTQRNFYEPQIITTDNTFVSGNCDVVIGIVNNT
RaTG13          TAPAICHDGKAHFPREGVFVSNGTHWFVTQRNFYEPQIITTDNTFVSGSCDVVIGIVNNT
                *******:***:******** *** **:*****:.*************.*******:***

SARS-CoV        VYDPLQPELDSFKEELDKYFKNHTSPDVDLGDISGINASVVNIQKEIDRLNEVAKNLNES
SARS-CoV-2      VYDPLQPELDSFKEELDKYFKNHTSPDVDLGDISGINASVVNIQKEIDRLNEVAKNLNES
RaTG13          VYDPLQPELDSFKEELDKYFKNHTSPDVDLGDISGINASVVNIQKEIDRLNEVAKNLNES
                ************************************************************

SARS-CoV        LIDLQELGKYEQYIKWPWYVWLGFIAGLIAIVMVTILLCCMTSCCSCLKGACSCGSCCKF
SARS-CoV-2      LIDLQELGKYEQYIKWPWYIWLGFIAGLIAIVMVTIMLCCMTSCCSCLKGCCSCGSCCKF
RaTG13          LIDLQELGKYEQYIKWPWYIWLGFIAGLIAIIMVTIMLCCMTSCCSCLKGCCSCGSCCKF
                *******************:***********:****:*************.*********

SARS-CoV        DEDDSEPVLKGVKLHYT      1255
SARS-CoV-2      DEDDSEPVLKGVKLHYT      1273
RaTG13          DEDDSEPVLKGVKLHYT      1269
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M Protein

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SARS-CoV        -MADNGTITVEELKQLLEQWNLVIGFLFLAWIMLLQFAYSNRNRFLYIIKLVFLWLLWPV
SARS-CoV-2      MADSNGTITVEELKKLLEQWNLVIGFLFLTWICLLQFAYANRNRFLYIIKLIFLWLLWPV
RaTG13          -MADNGTITVEELKKLLEQWNLVIGFLFLTWICLLQFAYANRNRFLYIIKLIFLWLLWPV
                   .**********:**************:** ******:***********:********

SARS-CoV        TLACFVLAAVYRINWVTGGIAIAMACIVGLMWLSYFVASFRLFARTRSMWSFNPETNILL
SARS-CoV-2      TLACFVLAAVYRINWITGGIAIAMACLVGLMWLSYFIASFRLFARTRSMWSFNPETNILL
RaTG13          TLACFVLAAVYRINWITGGIAIAMACLVGLMWLSYFIASFRLFARTRSMWSFNPETNILL
                ***************:**********:*********:***********************

SARS-CoV        NVPLRGTIVTRPLMESELVIGAVIIRGHLRMAGHSLGRCDIKDLPKEITVATSRTLSYYK
SARS-CoV-2      NVPLHGTILTRPLLESELVIGAVILRGHLRIAGHHLGRCDIKDLPKEITVATSRTLSYYK
RaTG13          NVPLHGTILTRPLLESELVIGAVILRGHLRIAGHHLGRCDIKDLPKEITVATSRTLSYYK
                ****:***:****:**********:*****:*** *************************

SARS-CoV        LGASQRVGTDSGFAAYNRYRIGNYKLNTDHAGSNDNIALLVQ
SARS-CoV-2      LGASQRVAGDSGFAAYSRYRIGNYKLNTDHSSSSDNIALLVQ
RaTG13          LGASQRVAGDSGFAAYSRYRIGNYKLNTDHSSSSDNIALLVQ
                *******. *******.*************:.*.********
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E protein

```
SARS-CoV-2       MYSFVSEETGTLIVNSVLLFLAFVVFLLVTLAILTALRLCAYCCNIVNVSLVKPSFYVYS
RaTG13           MYSFVSEETGTLIVNSVLLFLAFVVFLLVTLAILTALRLCAYCCNIVNVSLVKPSFYVYS
SARS-CoV         MYSFVSEETGTLIVNSVLLFLAFVVFLLVTLAILTALRLCAYCCNIVNVSLVKPTVYVYS
                 ******************************************************:.****

SARS-CoV-2       RVKNLNSSR-VPDLLV
RaTG13           RVKNLNSSR-VPDLLV
SARS-CoV         RVKNLNSSEGVPDLLV
                 ********. ******
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N Protein

```
SARS-CoV-2       MSDNGPQ-NQRNAPRITFGGPSDSTGSNQNGERSGARSKQRRPQGLPNNTASWFTALTQH
RaTG13           MSDNGPQ-NQRNAPRITFGGPSDSTGSNQNGERSGARPKQRRPQGLPNNTASWFTALTQH
SARS-CoV         MSDNGPQSNQRSAPRITFGGPTDSTDNNQNGGRNGARPKQRRPQGLPNNTASWFTALTQH
                 ******* ***.*********:***..**** *.*** **********************

SARS-CoV-2       GKEDLKFPRGQGVPINTNSSPDDQIGYYRRATRRIRGGDGKMKDLSPRWYFYYLGTGPEA
RaTG13           GKEDLKFPRGQGVPINTNSSPDDQIGYYRRATRRIRGGDGKMKDLSPRWYFYYLGTGPEA
SARS-CoV         GKEELRFPRGQGVPINTNSGPDDQIGYYRRATRRVRGGDGKMKELSPRWYFYYLGTGPEA
                 ***:*:*************.**************:********:****************

SARS-CoV-2       GLPYGANKDGIIWVATEGALNTPKDHIGTRNPANNAAIVLQLPQGTTLPKGFYAEGSRGG
RaTG13           GLPYGANKDGIIWVATEGALNTPKDHIGTRNPANNAAIVLQLPQGTTLPKGFYAEGSRGG
SARS-CoV         SLPYGANKEGIVWVATEGALNTPKDHIGTRNPNNNAATVLQLPQGTTLPKGFYAEGSRGG
                 .*******:**:******************** **** **********************

SARS-CoV-2       SQASSRSSSRSRNSSRNSTPGSSRGTSPARMAGNGGDAALALLLLDRLNQLESKMSGKGQ
RaTG13           SQASSRSSSRSRNSSRNSTPGSSRGTSPARMAGNGSDAALALLLLDRLNQLESKMSGKGQ
SARS-CoV         SQASSRSSSRSRGNSRNSTPGSSRGNSPARMASGGGETALALLLLDRLNQLESKVSGKGQ
                 ************..***********.******..*.::****************:*****

SARS-CoV-2       QQQGQTVTKKSAAEASKKPRQKRTATKAYNVTQAFGRRGPEQTQGNFGDQELIRQGTDYK
RaTG13           QQQSQTVTKKSAAEASKKPRQKRTATKQYNVTQAFGRRGPEQTQGNFGDQELIRQGTDYK
SARS-CoV         QQQGQTVTKKSAAEASKKPRQKRTATKQYNVTQAFGRRGPEQTQGNFGDQDLIRQGTDYK
                 ***.*********************** **********************:*********

SARS-CoV-2       HWPQIAQFAPSASAFFGMSRIGMEVTPSGTWLTYTGAIKLDDKDPNFKDQVILLNKHIDA
RaTG13           HWPQIAQFAPSASAFFGMSRIGMEVTPSGTWLTYTGAIKLDDKDPNFKDQVILLNKHIDA
SARS-CoV         HWPQIAQFAPSASAFFGMSRIGMEVTPSGTWLTYHGAIKLDDKDPQFKDNVILLNKHIDA
                 ********************************** **********:***:**********

SARS-CoV-2       YKTFPPTEPKKDKKKKADETQALPQRQKKQQTVTLLPAADLDDFSKQLQQSMSSADSTQA
RaTG13           YKTFPPTEPKKDKKKKADETQALPQRQKKQQTVTLLPAADLDDFSKQLQQSMSSADSTQA
SARS-CoV         YKTFPPTEPKKDKKKKTDEAQPLPQRQKKQPTVTLLPAADMDDFSRQLQNSMSGASADST
                 ****************:**:* ******** *********:****:***:***.*.: .:

SARS-CoV-2       --
RaTG13           --
SARS-CoV         QA
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Data S1. Homology of the predicted epitopes of S, M, E, N proteins among SARS-CoV-2, SARS-CoV and bat coronavirus RaTG13. Related to Figure 1.