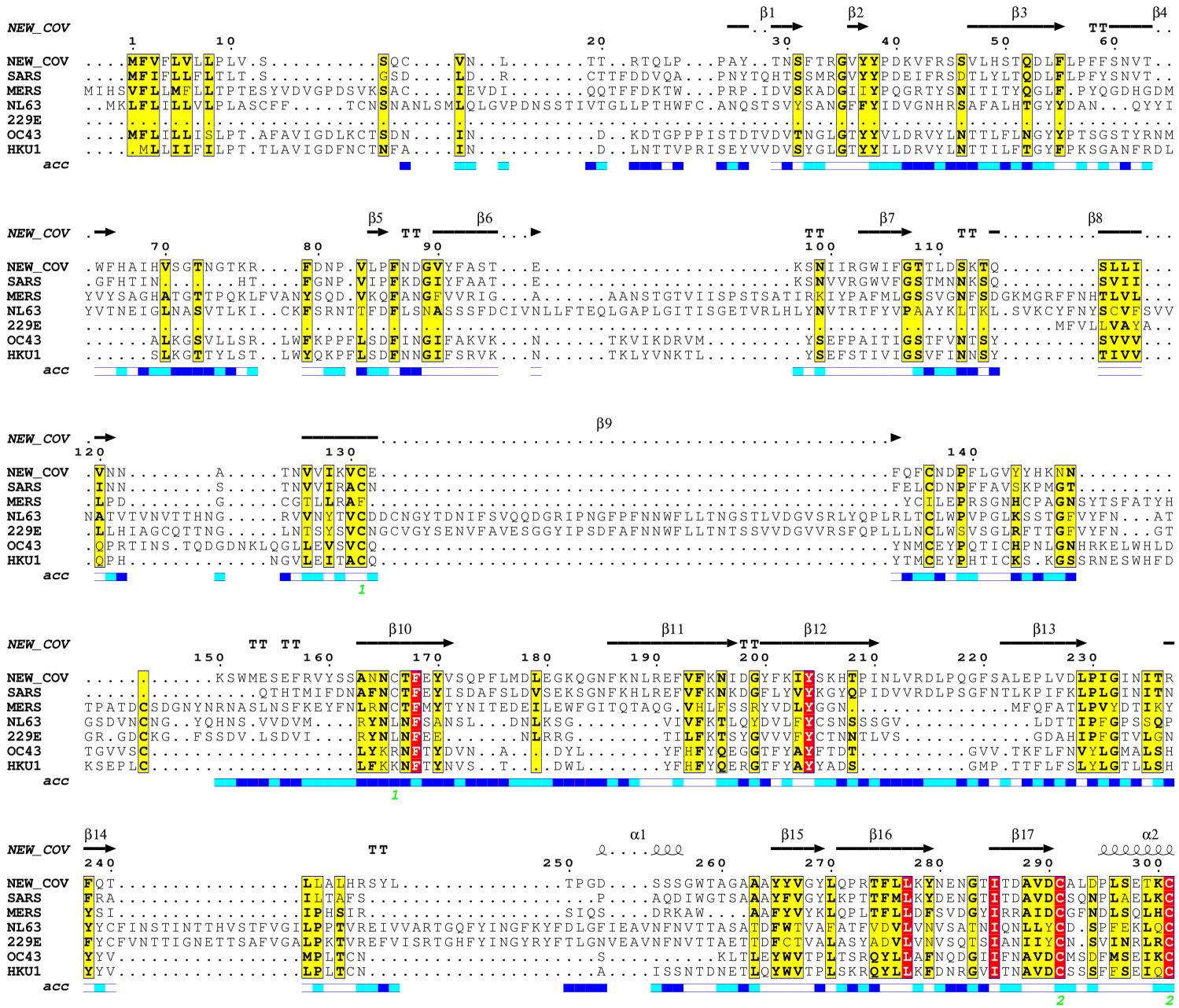
NEW_COV
SARS
MERS
NL63
229E
OC43
HKU1
acc
β1
β2
β3
β4
β5
β6
β7
β8
β9
β10
β11
β12
β13
β14
α1
β15
β16
β17
α2

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NEW_COV                β18        β19          α3          β20  β21  α4        β22       TT                β23
                                                   TT
                  310       320       330       340       350       360       370       380       390
NEW_COV  TLKSFTVEKGIYQTSNFRVQPTESIVRFPNITNLCPFGEVFNATRFASVYAWNRKRISNCVADYSVLYNSASFSTFKCYGVSPTKLNDLCFTNV......
SARS     SVKSFEIDKGIYQTSNFRVVPSGDVVRFPNITNLCPFGEVFNATKFPSVYAWERKKISNCVADYSVLYNSTFFSTFKCYGVSATKLNDLCFSNV......
MERS     SYESFDVESGVYSVSSFEAKPSGSVVEQAEG.VECDFSPLLSG.TPPQVYNFFKRLVFTNCNYNLTKLLSLFSVNDFTCSQISPAAIASNCYSSL......
NL63     EHLQFGLQDGFYSANFLDDNVLPETYVALPI...............YYQHTDINFT...................ATASFGGSCYVCKPHQVNI
229E     DQLSFDVPDGFYSTSPIQSVELPVSIVSLPV...............YHKHTFIVLY...................VDFKPQSGGGKCFNCYPAGVNI
OC43     KTQSIAPPTGVYELNGYTVQPIADVYRRKPNLPNCNIEAWLNDKSVPSPLNWERKTFSNCNFNMSSLMSFIQADSFTCNNIDAAKIYGMCFSSI......
HKU1     KTKSLLPNTGVYDLSGFTVKPVATVHRRIPDLPDCDIDKWLNNFNVPSPLNWERKIFSNCNFNLSTLLRLVHTDSFSCNNFDESKIYGSCFKSI......
acc                                                  3                 3                 4         5

NEW_COV                η1          α5        TT        β24          TT          β25          TT
                  400       410       420       430       440       450       460       470       480
NEW_COV  YADSFVIRGDEVRQIAPGQTGKIADYNYKLPDDFTGCVIAWNSNNLDSKVGGN......YNYLYRLFRKS......NLKPFERDISTEIYQA..GSTPCN
SARS     YADSFVVKGDDVRQIAPGQTGVIADYNYKLPDDFMGCVLAWNTRNIDATSTGN......YNYKYRYLRHG......KLRPFERDISNVPFSP..DGKPCT
MERS     ILDYFSYPLSMKSDLSVSSAGPISQFNYKQSFSNPTCLILATVPHNLTTITKP......LKYSYINKCSR......LLSDDRTEVPQLVNAN..QYSPCV
NL63     SLNG.......NTSVCVRTSHFSIRYI...................YNRVKSGSPGDSSWHIYLKSGT.C...PFSFSKLNNF.QKFKTICFST.....
229E     TLANFNET...KGPLCVDTSHFTTKYV...................AVYA.....NVGRWSASINTGN.C...PFSFGKVNNF.VKFGSVCFSL.....
OC43     TIDKFAIPNGRKVDLQLGNLGYLQSFNYRIDTTATSCQLYYNLPAANVSVSRFNPSTWNKRFGFIEDSVFKPRPAGVLTNHDVVYAQHCFKAPKNFCPCK
HKU1     VLDKFAIPNSRRSDLQLGSSGFLQSSNYKIDTTSSSCQLYYSLPAINVTINNYNPSSWNRRYGFNNF.........NLSSHSVVYSRYCFSVNNTFCPCA
acc                                                  4                                                     6

NEW_COV                                                β26          TT          η2                β27
                                                                                                  510
                                          490                     500
NEW_COV  GV..........E..GFNC................YF.............PLQSYGFQPT.............NGVGYQPY................RVVV
SARS     P...........P..ALNC................YW.............PLNDYGFYTT.............TGIGYQPY................RVVV
MERS     SI..........V..PST.................VWEDGDYYRKQL..SPLEGGGWLVA.............SGSTVAMT................EQLQ
NL63     ............VEVPGSCNFPLEA..........TWHYTSYTI.....................................................VGALY
229E     ............KDIPGGCAMPIVA..........NWAYSKYYT.....................................................IGSLY
OC43     LNGSCVGSGPGKNNGIGTC..PAGTNYLTCD.....................NLCTPDPITFTGTYKCPQTKSLVGIGEHCSGLAVKSDYCGG......NSCTCRPQAF
HKU1     KPSFAS.SCKSHKPPSASC..PIGTNYRSCESTTVLDHTDWCRCSCLPDPITAYDPRSCSQKKSLVGVGEHCAGFGVDEEKCGVLDGSYNVSCLCSTDAF
acc                                                  6

NEW_COV                β28          TT          β29          β30          TT                β31       β32
                                                                                                  580
                                  520       530       540       550       560       570
NEW_COV  LSF...............ELL....HAPATVCGP.....KKSTNLVKNKCVNFNFNGLTGTGVLTESNKKFL.PFQQFGRDIA.DTT.DAVRDPQTLEILD
SARS     LSF...............ELL....NAPATVCGP.....KLSTDLIKNQCVNFNFNGLTGTGVLTPSSKRFQ.PFQQFGRDVS.DFT.DSVRDPKTSEILD
MERS     MGF...............GITVQYGTDTNSVCPKLEFANDTKIASQLGNCVEYSLYGVSGRGVFQNCTAVGV.RQQRFVYDAY.QNLVGYYSD..DGNYYC
NL63     VTWSEGNSITGV...............PYPV.....SGIREFSNLVLNNCTKYNIYDYVGTGIIRSSNQSLAGG...ITYVSNSGNL.LGFKNVSTGNIFI
229E     VSWSDGDGITGV...............PQPV.....EGVSSFMNVTLDKCTKYNIYDVSGVGVIRVSNDTFLNG...ITYTSTSGNL.LGFKDVTKGTIYS
OC43     LGWSADSCLQGDKCNIFANFILHDVNSGLTCST..DLQKANTDIILGVCVNYDLYGILGQGIFVEVNATYYNSWQNLLYDSN.GNLY.GFRDYITNRTFM
HKU1     LGWSYDTCVSNNRCNIFSNFILNGINSGTTCSN..DLLQPNTEVFTDVCVDYDLYGITGQGIFKEVSAVYYNSWQNLLYDSN.GNII.GFKDFVTNKTYN
acc                                                  5                 7

NEW_COV                β33          β34          α6          β35  TT  β36  β37          β38  β39
                                                                                  TTT
                  590       600       610       620       630       640       650       660       670       680
NEW_COV  ITPCSFGGVSVITPGTNTSNQVAVLYQDVNCTEVPVAIHADQLT..PTWRVYSTGSNVFQTRAGCLIGAEHVN..NSYECDIPIGAGICASYQTQT.NSP
SARS     ISPCAFGGVSVITPGTNASSEVAVLYQDVNCTDVSTAIHADQLT..PAWRIYSTGNNVFQTQAGCLIGAEHVD..TSYECDIPIGAGICASYHTVS.L..
MERS     LRACVSVPVSVIYD..KETKTHATLFGSVACEHISSTMSQYSRSTRSMLKRRDSTYGPLQTPVGCVLGLVNSS.LFVEDCKLPLGQSLCALPDTPSTLTP
NL63     VTPCNQPDQVAVYQQ.........SIIGAMTAVNESRYGLQNLLQLP......NFYYVS....NGGNNCTT....AVMTYSNFGICADGSLIP....
229E     ITPCNPPDQLVVYQQ.........AVVGAMLSENFTSYGFSNVVELP......KFFYAS....NGTYNCTD....AVLTYSSFGVCADGSIIA....
OC43     IRSCYSGRVSAAFH..ANSSEPALLFRNIKCNYVFNNSLTRQLQPI.........NYFDSYLGCVVNAYNSTAISVQTCDLTVGSGYCVDYSK.....N
HKU1     IFPCYAGRVSAAFH..QNASSLALLYRNLKCSYVLNNIS...LTTQ.........PYFDSYLGCVFNADNLTDYSVSSCALRMGSGFCVDYNSPSSSSS
acc                                                  7                 8                 8                 9         9
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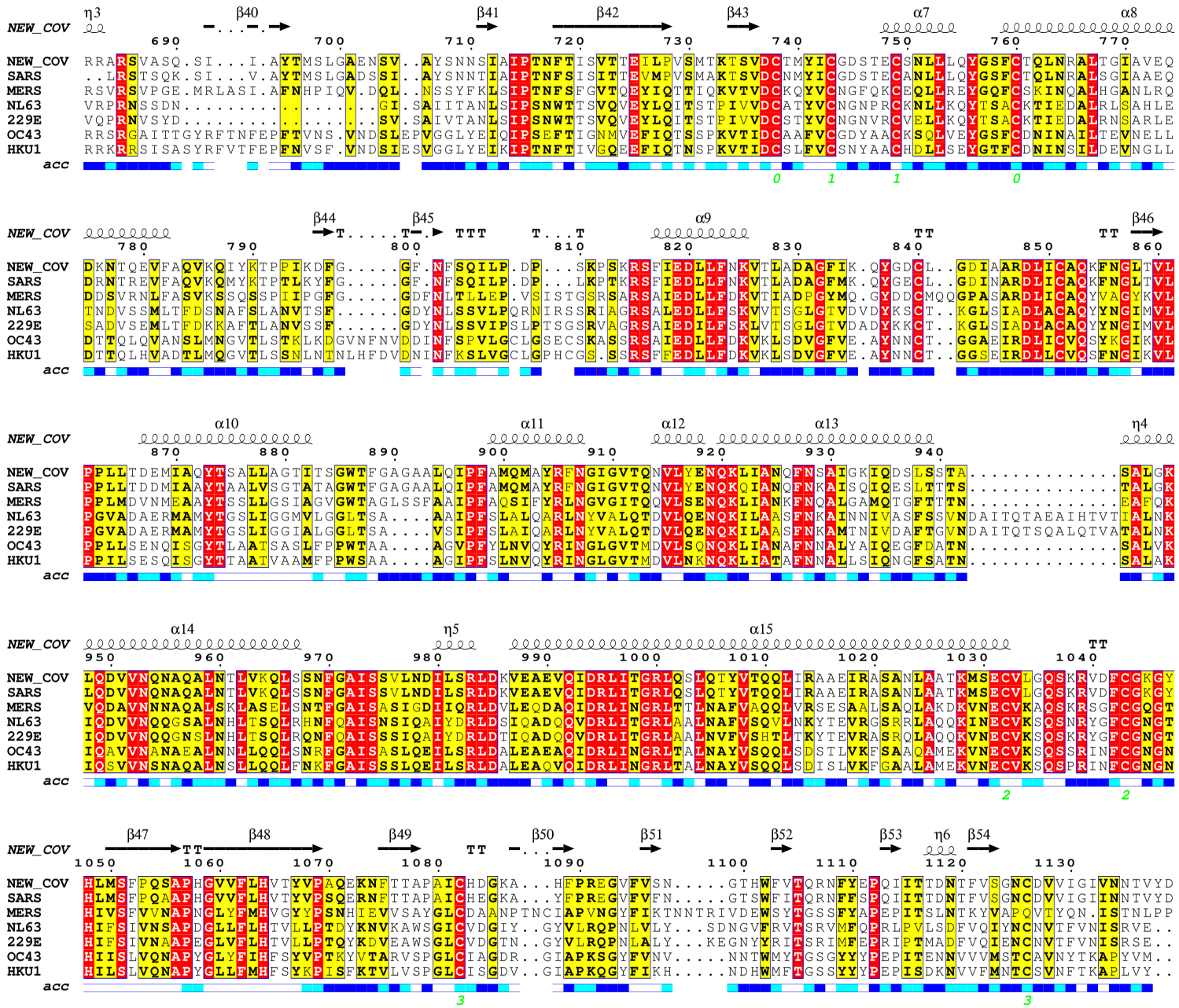
NEW_COV
SARS
MERS
NL63
229E
OC43
HKU1
acc

```
NEW_COV
     1140      1150      1160      1170                        1180      1190      1200      1210      1220
NEW_COV  PLQ..PELDSFKEELDKYFKNHTS.PDVDLG.DISGINASVVNI..............QKEIDRLNEVAKNLNESLIDLQELGKYEQYIKWPWYIWLGFI
SARS     PLQ..PELDSFKEELDKYFKNHTS.PDVDLG.DISGINASVVNI..............QKEIDRLNEVAKNLNESLIDLQELGKYEQYIKWPWYVWLGFI
MERS     PLLGNSTGIDFQDELDEFFKNVST.SIPNFG.SLTQINTTLLDL..............TYEMLSLQQVVKALNESYIDLKELGNYTYYNKWPWYIWLGFI
NL63     LHTVIPDYVDVNKTLQEFAQNLPKYVKPNF..DLTPFNLTYLNLSSELKQLEAKTASLFQTTVELQGLIDQINSTYVDLKLLNRFENYIKWPWWVWLIIS
229E     LQTIVPEYIDVNKTLQELSYKLPNYTVPDL..VVEQYNQTILNLTSEISTLENKSAELNYTVQKLQTLIDNINSTLVDLKWLNRVETYIKWPWWVWLCIS
OC43     LNTSIPNLPDFKEELDQWFKNQTS.VAPDLSL..DYINVTFLDL..............QVEMNRLQEAIKVLNQSYINLKDIGTYEYYVKWPWYVWLLIC
HKU1     LNHSVPKLSDFESELSHWFKNQTS.IAPNLTLNLHTINATFLDL..............YYEMNLIQESIKSLNNSYINLKDIGTYEMYVKWPWYVWLLIS
    acc
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NEW_COV
            1230      1240              1250      1260      1270
NEW_COV  AGLIAIVMVTIMLCCMTSCCSCLK.......GCCSCGSCCKF.DEDDSEPVLKGVKLHYT
SARS     AGLIAIVMVTILLCCMTSCCSCLK.......GACSCGSCCKF.DEDDSEPVLKGVKLHYT
MERS     AGLVALALCVFFILCCTGCGTNCM.......GKLKCNRCCDRYEEYDLEPHKVHVH....
NL63     VVFVVLLSLLVFCCLSTGCCGCCNCLTSSMRGCCDCGSTKLPYYEFEKVHVQ.....
229E     VVLIFVVSMLLLCCCSTGCCGFFSCFASSIRGCCE...STKLPYYDVEKIHIQ.....
OC43     LAGVAMLVLLFFICCCTGCGTSCF.......K..KCGGCCDDYTGYQELVIK.TSHDD..
HKU1     FSFIIFLVLLFFICCCTGCGSACF.......S..KCHNCCDEYGGHHDFVIK.TSHDD..
    acc
```