

## *Supplementary Material*

### 1    1      **Supplementary Data**

2    Multiple sequence alignment uploaded as pdf file.

3

4    2    **Supplementary Figures and Tables**5    **2.1 Supplementary Figures**

6



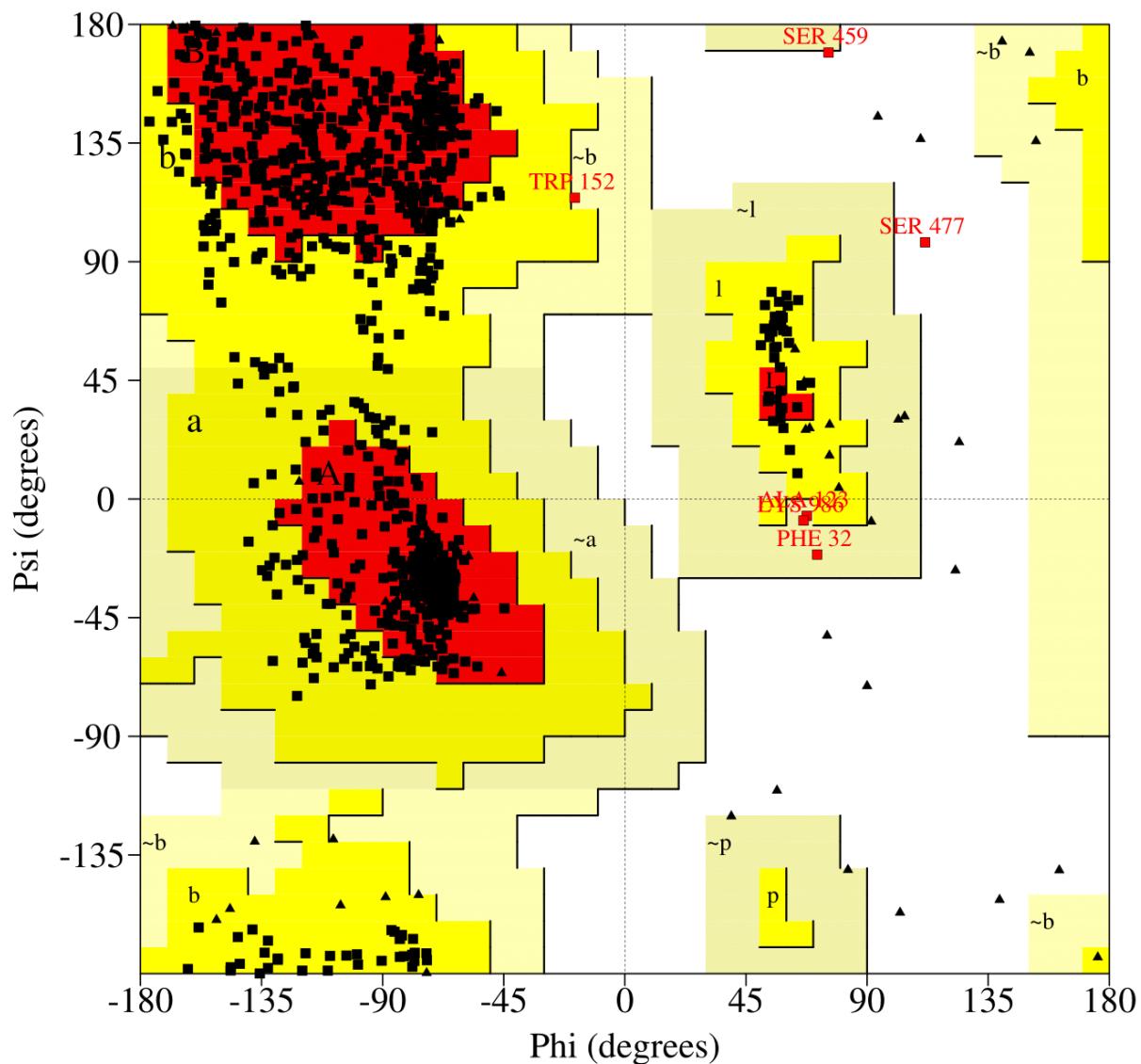
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9    **Supplementary Figure 1.** Evolutionary divergence analysis of available spike glycoproteins of  
10    different strains of SARS-CoV-2; results are represented in a phylogenetic tree.

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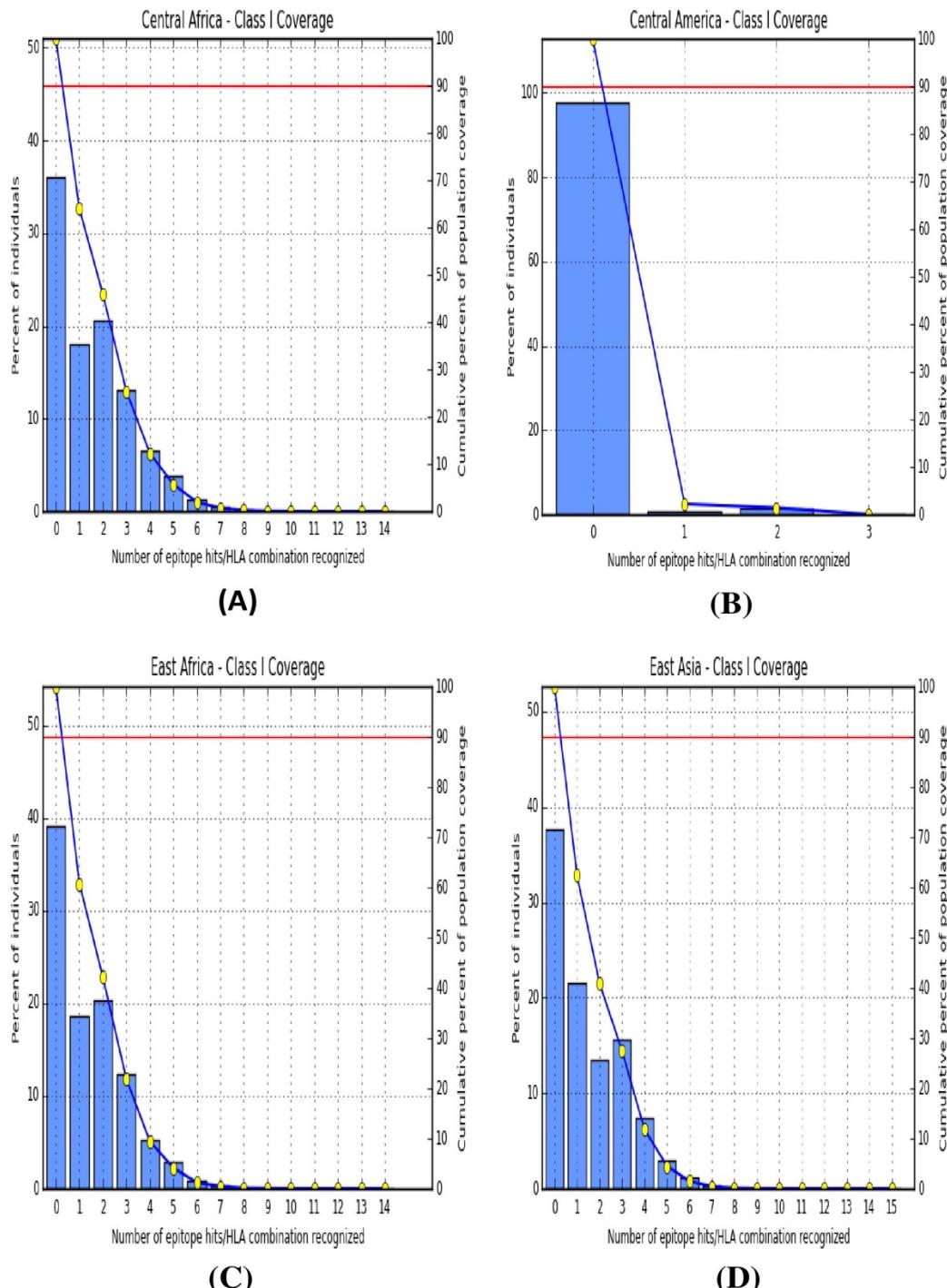
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14 **Supplementary Figure 2.** Ramachandran plot analysis for the tertiary structure of the SARS-CoV-2  
15 SGP.

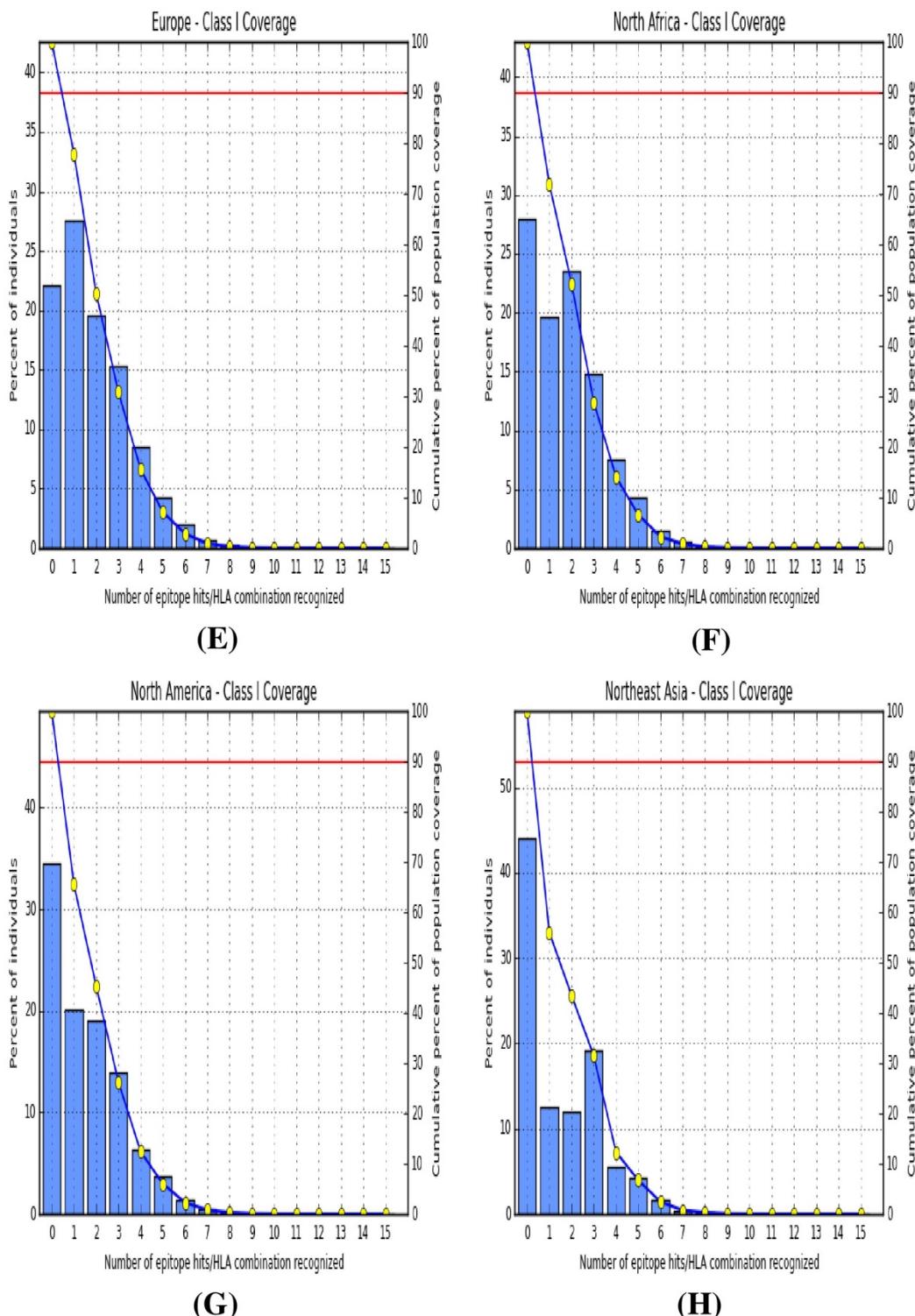
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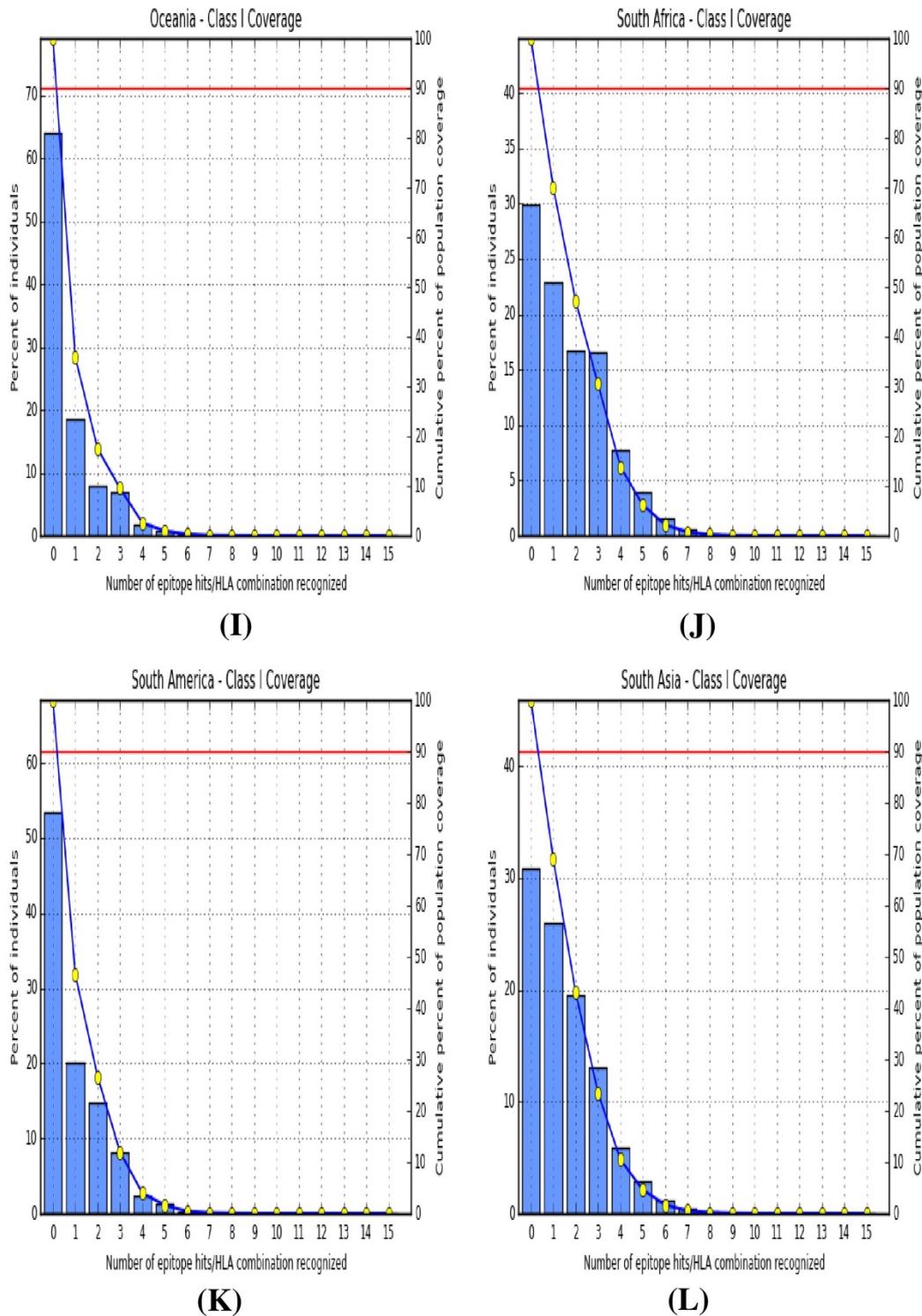
19 **Supplementary Figure 3.** Population coverage based on MHC restriction data for **(A)** Central Africa,  
20 **(B)** Central America, **(C)** East Africa, **(D)** East Asia - using the Immune Epitope Database analysis  
21 resource.



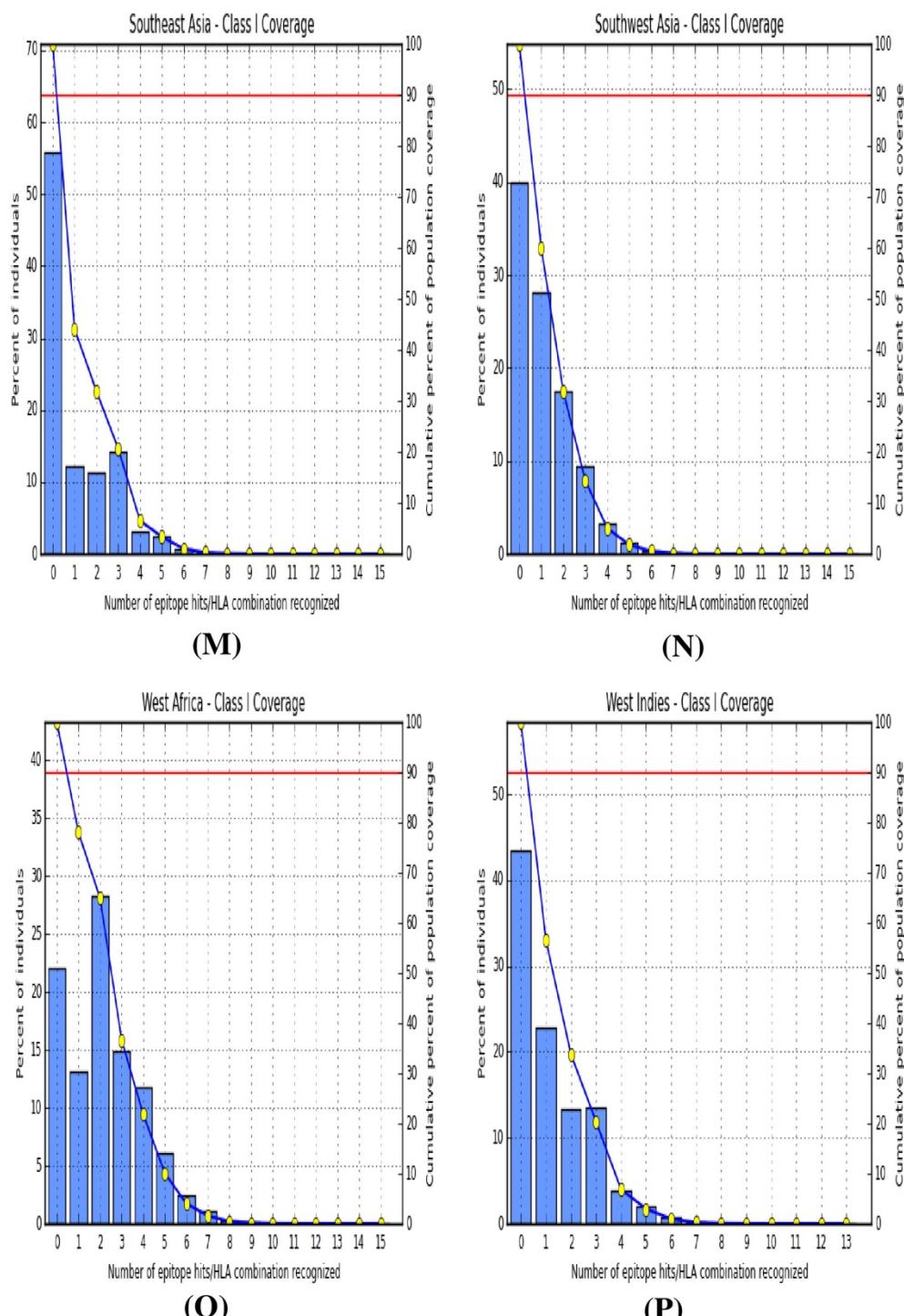
22

23 **Supplementary Figure 4.** Population coverage based on MHC restriction data for (E) Europe, (F)  
 24 North Africa, (G) North America, (H) Northeast Asia - using the Immune Epitope Database analysis  
 25 resource.

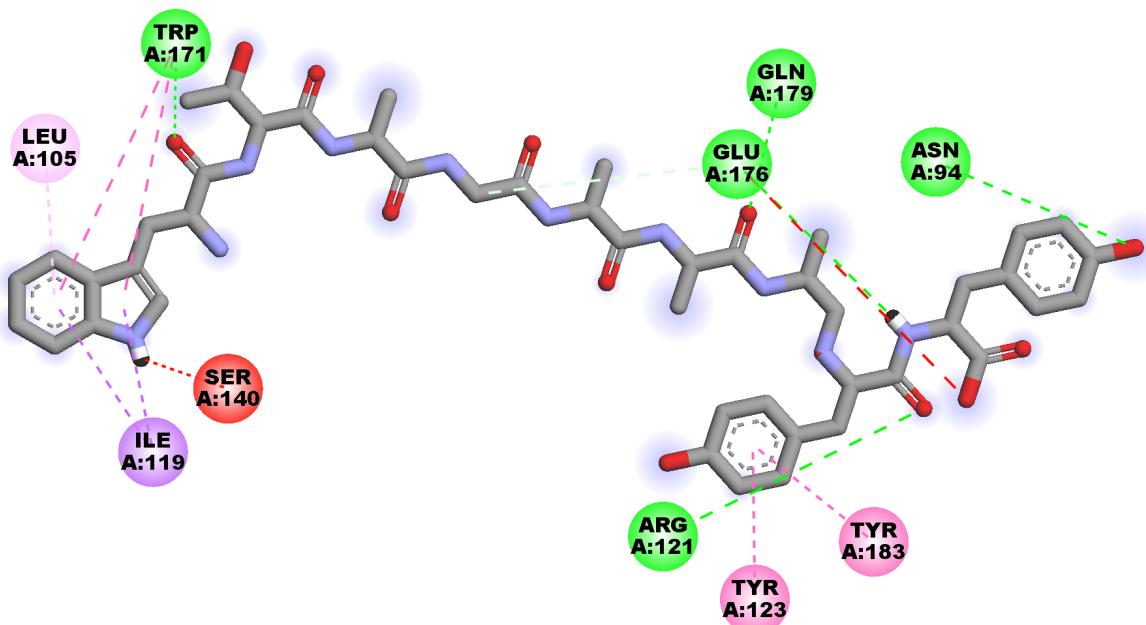
26



28 **Supplementary Figure 5.** Population coverage based on MHC restriction data for (I) Oceania, (J)  
29 South Africa, (K) South America, (L) South Asia - using the Immune Epitope Database analysis  
30 resource.



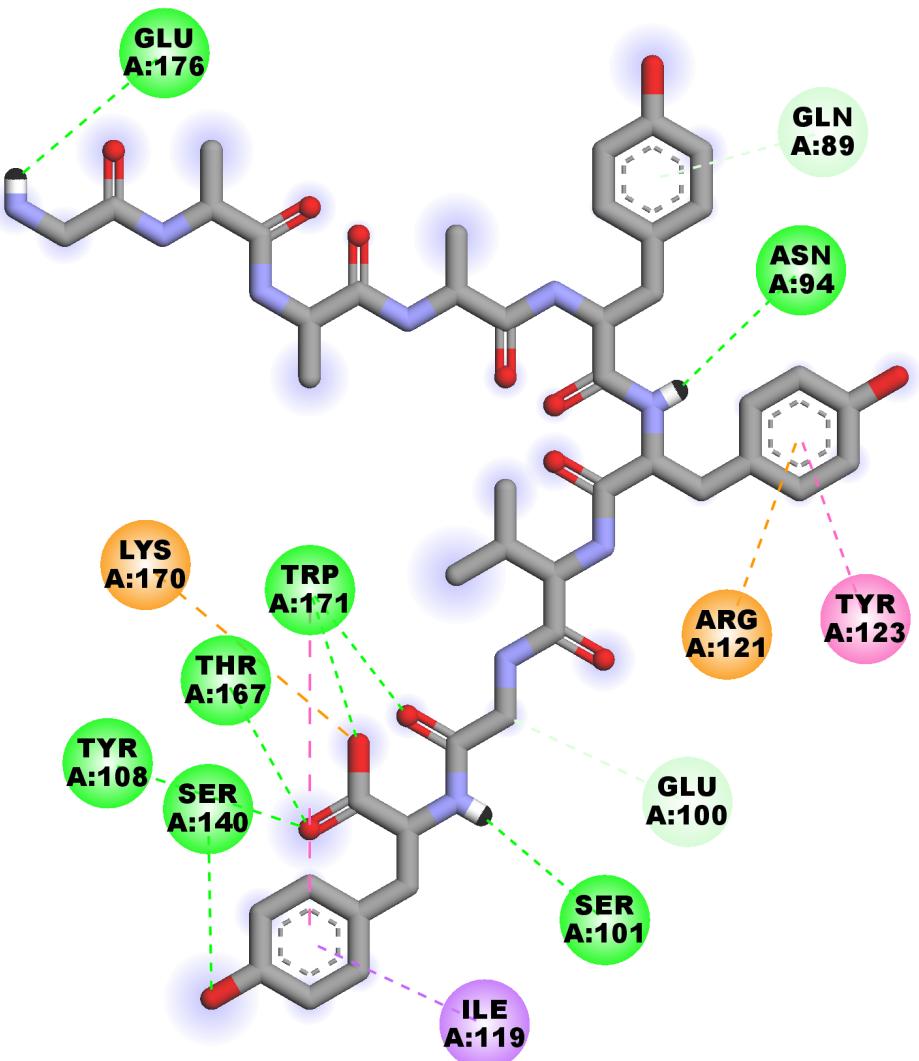
34 **Supplementary Figure 6.** Population coverage based on MHC restriction data for **(M)** Southeast Asia,  
 35 **(N)** Southwest Asia, **(O)** West Africa, **(P)** West Indies - using the Immune Epitope Database analysis  
 36 resource.



37

38 **Supplementary Figure 7.** 2D representation of the interaction between epitope WTAGAAAYY and  
39 HLA-B\*15:25 allele.

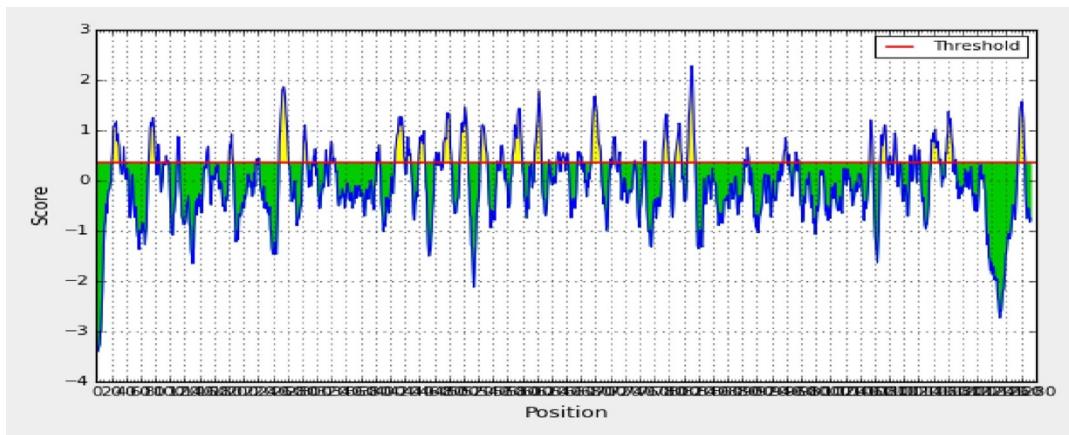
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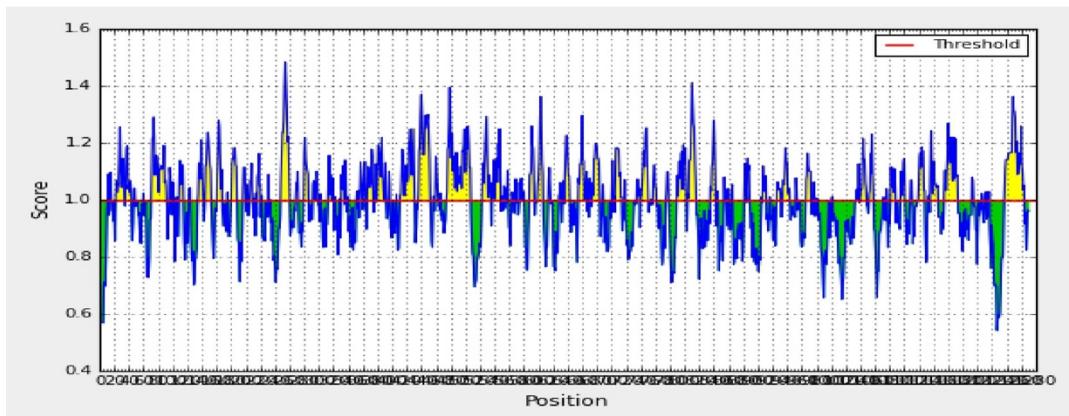
41

42 **Supplementary Figure 8.** 2D representation of the interaction between epitope GAAAYYVGY and  
43 HLA-B\*15:25 allele.

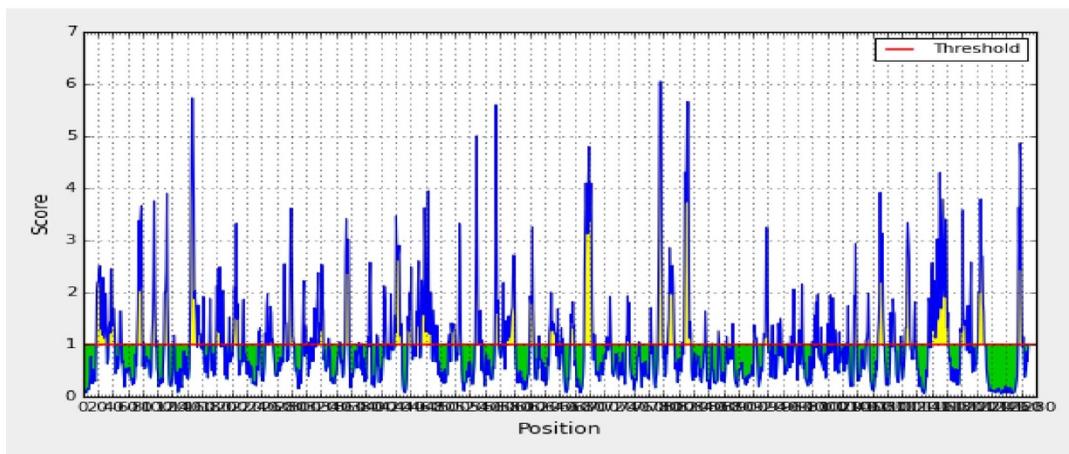
44



(A)



(B)

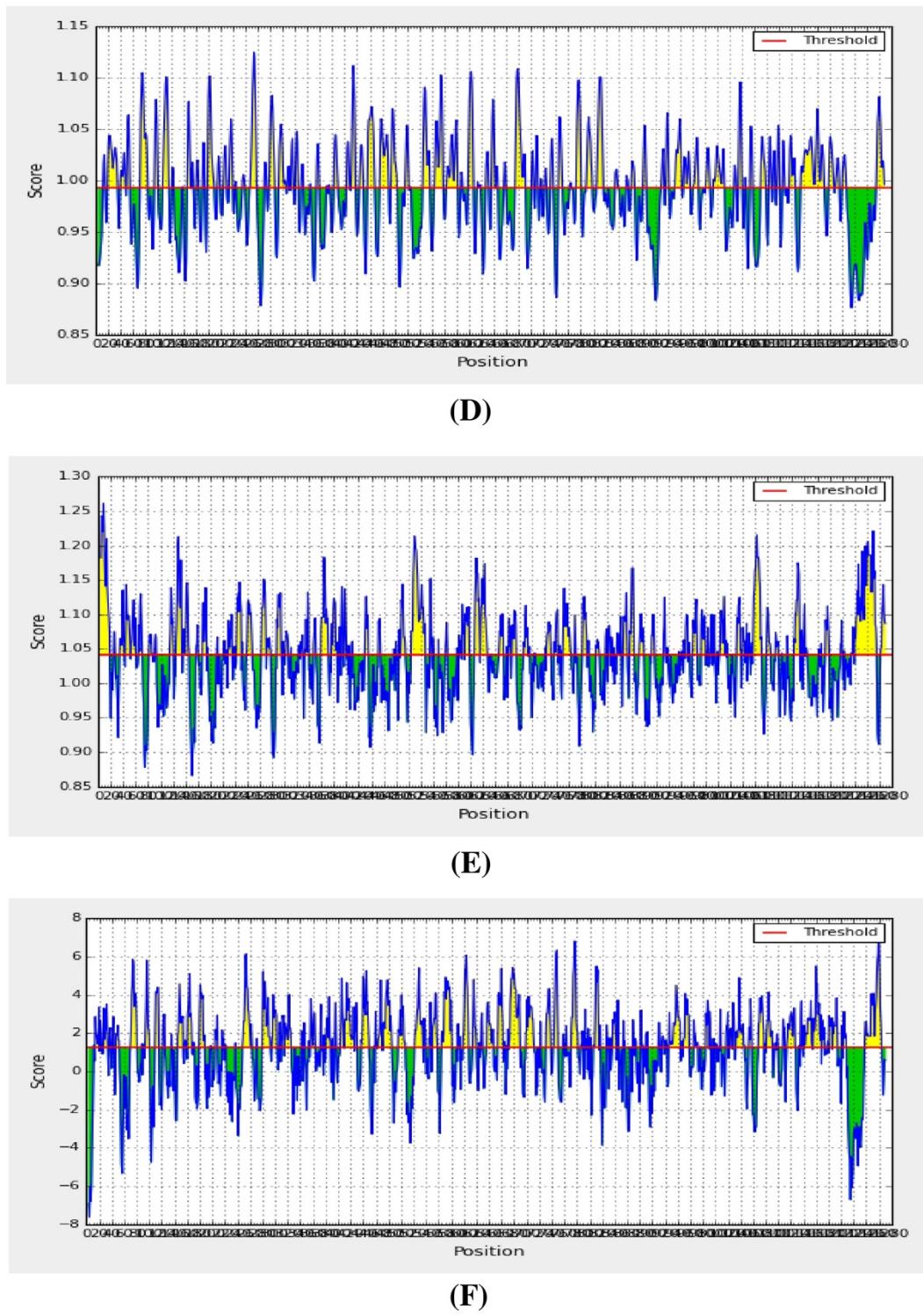


(C)

45

46 **Supplementary Figure 9.** Combined B-cell linear epitope prediction using (A) Bepipred linear  
47 epitope prediction, (B) Chou & Fasman beta-turn prediction, (C) Emini surface accessibility  
48 prediction methods.

49



50

51 **Supplementary Figure 10.** Combined B-cell linear epitope prediction using **(D)** Karplus &  
 52 Schulz flexibility prediction, **(E)** Kolaskar & Tongaonkar antigenicity, **(F)** Parker  
 53 hydrophilicity prediction methods.

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55 **2.2 Supplementary Tables**56 **TABLE S1** Antigenicity prediction of selected epitopes using VaxiJen 2.0 server

Epitopes	Antigen Prediction
LTDEMIAQY	Probable NON-ANTIGEN
WTAGAAAYY	Probable ANTIGEN
TSNQVAVLY	Probable ANTIGEN
CVADYSVLY	Probable NON-ANTIGEN
KTSVDCTMY	Probable ANTIGEN
STECSNLL	Probable ANTIGEN
GAEHVNNSY	Probable ANTIGEN
NIDGYFKIY	Probable NON-ANTIGEN
YSSANNCTF	Probable NON-ANTIGEN
WMESEFRVY	Probable NON-ANTIGEN
SANNCTFEY	Probable NON-ANTIGEN
VASQSIIAY	Probable NON-ANTIGEN
NSFTRGVYY	Probable NON-ANTIGEN
CNDPFLGVY	Probable ANTIGEN
FTNVYADSF	Probable NON-ANTIGEN
GAAAYYVGY	Probable ANTIGEN
RISNCVADY	Probable NON-ANTIGEN
ERDISTEIY	Probable NON-ANTIGEN
ITDAVDCAL	Probable ANTIGEN
RVDFCGKGY	Probable NON-ANTIGEN
NATRFASVY	Probable NON-ANTIGEN
MTSCCSCLK	Probable ANTIGEN
STQDLFLPF	Probable ANTIGEN

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59 **TABLE S2** MHC-NP probability score for the selected epitopes

Epitopes	Alleles	Length	Probability score
GAAAYYVGY	HLA-B*44:03	9	0.7289
	HLA-B*53:01	9	0.2176
	HLA-B*35:01	9	0.0634
	HLA-B*57:01	9	0.0549
	HLA-A*02:01	9	0.0005
	HLA-B*07:02	9	0.0003
	HLA-B*44:03	9	0.8754
	HLA-B*53:01	9	0.2737
	HLA-B*57:01	9	0.0423
	HLA-B*35:01	9	0.0395
STQDQLFLPF	HLA-B*07:02	9	0.0122
	HLA-A*02:01	9	0.0019
	HLA-B*44:03	9	0.8185
	HLA-B*53:01	9	0.5287
	HLA-B*57:01	9	0.0527
	HLA-B*35:01	9	0.0374
	HLA-B*07:02	9	0.0001
	HLA-A*02:01	9	0

## *Multiple Sequence Analysis*

	1	10	20	30	40	50
sp P0DT2C SPIKE_SARS2_Spike_g1	MF <span style="background-color: #00FFFF;">V</span> .....FLVLLPLVLSSQ <span style="background-color: #00FFFF;">C</span> VNLTTRTQLPPAYT <span style="background-color: #00FFFF;">N</span> SFT <span style="background-color: #00FFFF;">RGVY</span> YPD <span style="background-color: #00FFFF;">DKVFRS</span> SVLHST <span style="background-color: #00FFFF;">Q</span> D					
sp P59594 SPIKE_CVHSA	MF <span style="background-color: #00FFFF;">I</span> ....FLL.FLTLLTSGSDLDR <span style="background-color: #00FFFF;">C</span> TTFDDVVQAPNYTQH <span style="background-color: #00FFFF;">T</span> SSMR <span style="background-color: #00FFFF;">RGVY</span> YPD <span style="background-color: #00FFFF;">DEIFRS</span> DLYLTLT <span style="background-color: #00FFFF;">Q</span> D					
tr D2E1E7 D2E1E7_CVHSA	MF <span style="background-color: #00FFFF;">I</span> ....FLL.FLTLLTSGSDLDR <span style="background-color: #00FFFF;">C</span> TTFDDVVQAPNYTQH <span style="background-color: #00FFFF;">T</span> SSMR <span style="background-color: #00FFFF;">RGVY</span> YPD <span style="background-color: #00FFFF;">DEIFRS</span> DLYLTLT <span style="background-color: #00FFFF;">Q</span> D					
tr D2E1D2 D2E1D2_CVHSA	MF <span style="background-color: #00FFFF;">I</span> ....FLL.FLTLLTSGSDLDR <span style="background-color: #00FFFF;">C</span> TTFDDVVQAPNYTQH <span style="background-color: #00FFFF;">T</span> SSMR <span style="background-color: #00FFFF;">RGVY</span> YPD <span style="background-color: #00FFFF;">DEIFRS</span> DLYLTLT <span style="background-color: #00FFFF;">Q</span> D					
tr A0A166ZL64 A0A166ZL64_9NIDO	MF <span style="background-color: #00FFFF;">I</span> VFLLISYTTFILIPYATTTC <span style="background-color: #00FFFF;">C</span> ..FSGKPTTENKLNI <span style="background-color: #00FFFF;">S</span> SGS <span style="background-color: #00FFFF;">RGVY</span> YPD <span style="background-color: #00FFFF;">DIDFRS</span> NVSVLVT <span style="background-color: #00FFFF;">TG</span>					
tr A0AOU1UYX4 A0AOU1UYX4_CVHSA	MF <span style="background-color: #00FFFF;">I</span> VFLLISYTTFILIPYATTTC <span style="background-color: #00FFFF;">C</span> ..FKGKPTTENKLNI <span style="background-color: #00FFFF;">S</span> SGS <span style="background-color: #00FFFF;">RGVY</span> YPD <span style="background-color: #00FFFF;">DIDFRS</span> NVSVLVT <span style="background-color: #00FFFF;">TG</span>					
tr R9QTA0 R9QTA0_CVHSA	M <span style="background-color: #00FFFF;">I</span> LIF....LLFLSLSAKAQEG <span style="background-color: #00FFFF;">C</span> GIVINSNPKRQTRFDQY <span style="background-color: #00FFFF;">S</span> STFR <span style="background-color: #00FFFF;">RGVY</span> YN <span style="background-color: #00FFFF;">DIDFRS</span> DVLHLT <span style="background-color: #00FFFF;">Q</span> D					
tr A0AOK1Z074 A0AOK1Z074_CVHSA	M <span style="background-color: #00FFFF;">K</span> I LIF....AFLVTLVLKVAQE <span style="background-color: #00FFFF;">C</span> GIVINLRLTQPKLQS <span style="background-color: #00FFFF;">V</span> SSR <span style="background-color: #00FFFF;">RGVY</span> YN <span style="background-color: #00FFFF;">DIDFRS</span> DVLHLT <span style="background-color: #00FFFF;">Q</span> D					
sp Q3LZX1 SPIKE_BCHK3	M <span style="background-color: #00FFFF;">K</span> I LIF....AFLANLAKAQEG <span style="background-color: #00FFFF;">C</span> GIISRKPKQPKMAQV <span style="background-color: #00FFFF;">S</span> SSR <span style="background-color: #00FFFF;">RGVY</span> YN <span style="background-color: #00FFFF;">DIDFRS</span> DVLHLT <span style="background-color: #00FFFF;">Q</span> D					
sp Q3I5J5 SPIKE_BCRP3	M <span style="background-color: #00FFFF;">K</span> I LIL....AFLASLAKAQEG <span style="background-color: #00FFFF;">C</span> GIISRKPKQPKMAQV <span style="background-color: #00FFFF;">S</span> SSR <span style="background-color: #00FFFF;">RGVY</span> YN <span style="background-color: #00FFFF;">DIDFRS</span> NVLHLT <span style="background-color: #00FFFF;">Q</span> D					
sp Q0Q475 SPIKE_BC279	M <span style="background-color: #00FFFF;">K</span> V LIF....ALLFLSLSAKAQEG <span style="background-color: #00FFFF;">C</span> GIISRKPKQPKMKEV <span style="background-color: #00FFFF;">S</span> SSR <span style="background-color: #00FFFF;">RGVY</span> YN <span style="background-color: #00FFFF;">DIDFRS</span> DVLHLT <span style="background-color: #00FFFF;">Q</span> D					
tr Q0QDX9 Q0QDX9_CVHSA	M <span style="background-color: #00FFFF;">K</span> V LIF....ALLFLSLSAKAQEG <span style="background-color: #00FFFF;">C</span> GIISRKPKQPKMKEV <span style="background-color: #00FFFF;">S</span> SSR <span style="background-color: #00FFFF;">RGVY</span> YN <span style="background-color: #00FFFF;">DIDFRS</span> DVLHLT <span style="background-color: #00FFFF;">Q</span> D					
tr A0A2I4AL96 A0A2I4AL96_9TELE	.....					
tr A0A1U7RHG6 A0A1U7RHG6_MESAU	.....					
tr HOUY28 HOUY28_CAVPO	.....					
tr A0A2K5QWK6 A0A2K5QWK6_CEBCA	.....					
tr F6UG70 F6UG70_CALJA	.....					

	6 0	7 0	8 0	9 0	1 0 0	1 1 0
sp P0DT2C SPIKE_SARS2_Spike_g1	L F L P F F S N V T W F H A I H V S G T N G T K R F D N P V L P F N D G V Y F A S T E K S N I I R G W I F G T T L D S K					
sp S95941 SPIKE_CVHSA	L F L P F Y S N V T G F H T I N H . . . . . T F G N P V I P F K D G I Y F A A T E K S N N V R G W V F G S T M N N K					
tr D2E1E7 D2E1E7_CVHSA	L F L P F Y S N V T G F H T I N H . . . . . T F G N P V I P F K D G I Y F A A T E K S N N V R G W V F G S T M N N K					
tr D2E1D2 D2E1D2_CVHSA	L F L P F Y S N V T G F H T I N H . . . . . T F G N P V I P F K D G I Y F A A T E K S N N V R G W V F G S T M N N K					
tr AOA166ZL64 AOA166ZL64_9NIDO	R F L R F N T T L W Y S N W N Q . . . . . A Y S S P V L P F G H G V Y F S T I D K S N N V R G W I F G T T L D N T					
tr AOA001UYX4 AOA001UYX4_CVHSA	R F L R F N T T L W Y S N W N Q . . . . . A Y S S P V L P F G H G V Y F S T I D K S N N V R G W I F G T T L D N T					
tr R9QTA0 R9QTA0_CVHSA	Y F L P F N T N V T R Y L S L N A A Q . N T I V Y F D N H V I P F Y D G I Y F A A T E R S N V I R G W I F G S T F D N R					
tr AOA0K1Z074 AOA0K1Z074_CVHSA	Y F L P F H S N L T Q Y F S L S I Q S . D K I V Y F D N P I L K F D G I Y F A A T E K S N N V R G W V F G S T F D N T					
sp Q3LZX1 SPIKE_BCHK3	Y F L P F D S N L T Q Y F S L N V D S . D R Y T Y F D N P I L D F G D G V Y F A A T E K S N N V R G W I F G S S F D N T					
sp Q3I5J5 SPIKE_BCRP3	Y F L P F D S N L T Q Y F S L N V D S . D R F T Y F D N P I L D F G D G V Y F A A T E K S N N V R G W V F G S T F D N T					
sp Q0Q475 SPIKE_BC279	Y F L P F D S N L T Q Y F S L N I D S . N K Y T Y F D N P I L D F G D G V Y F A A T E K S N N V R G W I F G S S F D N T					
tr Q0QDX9 Q0QDX9_CVHSA	Y F L P F D S N L T Q Y F S L N I D S . N K Y T Y F D N P I L D F G D G V Y F A A T E K S N N V R G W I F G S S F D N T					
tr AOA2I4AL96 AOA2I4AL96_9TELE	.....					
tr AOA1U7RHG6 AOA1U7RHG6_MESAU	.....					
tr HOUY28 HOUY28_CAVPO	.....					
tr AOA2K5QW6 AOA2K5QW6_CEBCA	.....					
tr F6UG70 F6UG70_CATJA	.....					

	1 2 0	1 3 0	1 4 0	1 5 0	1 6 0	1 7 0
sp P0DT2C SPIKE_SARS2_Spike_g1	T Q S S L I V N N A T N N V I K V C E F Q F C N D P F L G V Y Y H K N N K S W M E S E F R V Y S S A N N C T F E Y V S Q					
sp P59594 SPIKE_CVHSA	S Q S V I I I N N S T N N V I I R A C N F E L C D N P F F A V S K P M G T . . . Q T H T M I F D N A F N C T F E Y I S D					
tr D2E1E7 D2E1E7_CVHSA	S Q S V I I I N N S T N N V I I R A C N F E L C D N P F F A V S K P M G T . . . Q T H T M I F D N A F N C T F E Y I S D					
tr D2E1D2 D2E1D2_CVHSA	S Q S V I I I N N S T N N V I I R A C N F E L C D N P F F A V S K P M G T . . . Q T H T M I F D N A F N C T F E Y I S D					
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tr A0A01UUYX4 A0A01UUYX4_CVHSA	T Q S A L L V N N N G S A I T I E V C Y F Q F C D N P A F I I R D . . G A . . . Q I N T A I Y I N L R N C T Y V D T L R					
tr R9QTA0 R9QTA0_CVHSA	T Q S A I I V N N N S T H I I L V K V C N F V L C T E P M F T V S R . . N Q . . . H Y K S W V Y Q H A R N C T Y D V A Y P					
tr A0A0K1Z074 A0A0K1Z074_CVHSA	T Q S A I I V N N N S T H I I L V K V C N F V L C T E P M F T V S R . . N Q . . . H Y K S W V Y Q H A R N C T Y D V A Y P					
sp Q3LZX1 SPIKE_BCHK3	T Q S A I V V N N S T H I I I R V C N F N L C K E P M Y T V S R . . G A . . . Q Q N A W V Y Q S A F N C T Y D R V E K					
sp Q3I5J5 SPIKE_BCRP3	T Q S A I V V N N S T H I I I R V C N F N L C K E P M Y T V S R . . G A . . . Q Q N A W V Y Q S A F N C T Y D R V E K					
sp Q0Q475 SPIKE_BC279	T Q S A I V V N N S T H I I I R V C N F N L C K E P M Y T V S R . . G A . . . Q Q N A W V Y Q S A F N C T Y D R V E K					
tr Q0QDX9 Q0QDX9_CVHSA	T Q S A I V V N N S T H I I I R V C N F N L C K E P M Y T V S R . . G A . . . Q Q N A W V Y Q S A F N C T Y D R V E K					
tr A0A2I4AL96 A0A2I4AL96_9TELE	· · · · · · ·					
tr A0A1U7RHG6 A0A1U7RHG6_MESAU	· · · · · · ·					
tr HOUY28 HOUY28_CAVPO	· · · · · · ·					
tr A0A2K5QWK6 A0A2K5QWK6_CEBCA	· · · · · · ·					
tr ECHG70 ECHG70_GLYC	· · · · · · ·					

	180	190	200	210	220
sp P0DT2C SPIKE_SARS2_Spike_g1	PFLMDLEGK.QGNFKN	LREFVFKNIDGYFKIY	SKHTPINLVR....DLPQGFSAL	LEPLVD	
sp P59594 SPIKE_CVHSA	AFLLDVSEK.SGNFKH	LREFVFKNKGFLYVYK	KGYQPIDI	DLPMSGFNT	LKPPIFK
tr D2E1E7 D2E1E7_CVHSA	AFSLDVSEK.SGNFKH	LREFVFKNKGFLYVYK	KGYQPIDI	DLPMSGFNT	LKPPIFK
tr D2E1D2 D2E1D2_CVHSA	AFSLDVSEK.SGNFKH	LREFVFKNKGFLYVYK	KGYQPIDI	DLPMSGFNT	LKPPIFK
tr A0A166ZL64 A0A166ZL64_9NIDO	DPLLSFED.VDGGFKH	LREFVFKNKGFLYVYK	GYPDI	DLPMSGFNT	LKPPIFK
tr A0A0U1UYX4 A0A0U1UYX4_CVHSA	DPLLSFAE.VDGGFKH	LREFVFKNSDGF	IYGAYQPYDLAIGATAALPAQFLPL	LKPPLWKA	
tr R9QTA0 R9QTA0_CVHSA	SFQLDVSLLKNNVNQFH	LREFIFVKNDGFL	IYGAYQPYDLAIGATAALPAQFLPL	LKPPLWKA	
tr A0A0K1Z074 A0A0K1Z074_CVHSA	SFQLDVTAPK.TGNFKI	LREFVFKNRDGF	ISSYEPINVVS...GIPMSGFSVL	KPVMSL	
sp Q3LZX1 SPIKE_BCHK3	SFQLDVTAPK.TGNFKI	LREFVFKNRDGF	FVYQDTPVNLRL...GLPAGLSV	LKPILK	
sp Q3I5J5 SPIKE_BCRP3	SFQLDVTAPK.TGNFKD	LREYVFKNRDGF	LYQTYTAVNLPR...GLPTGFSV	LKPILK	
sp Q0Q475 SPIKE_BC279	SFQLDVTAPK.TGNFKD	LREYVFKNRDGF	LSVYQTYTAVNLPR...GFPAGFSV	LKPILK	
tr Q0QDX9 Q0QDX9_CVHSA	SFQLDVTAPK.TGNFKD	LREYVFKNGGGFL	LRVYQTYTAVNLPR...GFPAGFSV	LKPILK	
tr A0A2I4AL96 A0A2I4AL96_9TELE	.....	.....	.....	.....	.....
tr A0A1U7RHG6 A0A1U7RHG6_MESAU	.....	.....	.....	.....	.....
tr HOUY28 HOUY28_CAVPO	.....	.....	.....	.....	.....
tr A0A2K5QW6 A0A2K5QW6_CEBCA	.....	.....	.....	.....	.....
tr E5C676 E5C676_0017	.....	.....	.....	.....	.....

	230	240	250	260	270	280
sp P0DT2 SPIKE_SARS2_Spike_g1	LPIGINITRFQTLAHRSYLTPGDS	SGWTAGAAAYVGVY	QPRRTFLIKVNENGTT			
sp P59594 SPIKE_CVHSA	LPLGINITNFRAILTAFS	PAQDIWGTSAAAYFVG	LKPRTFMILKYDENGTITD			
tr D2E1E7 D2E1E7_CVHSA	LPLGINITNFRAILTAFS	PAQDIWGTSAAAYFVG	LKPRTFMILKYDENGTITD			
tr D2E1D2 D2E1D2_CVHSA	LPLGINITNFRAILTAFS	PAQDIWGTSAAAYFVG	LKPRTFMILKYDENGTITD			
tr A0A166ZL64 A0A166ZL64_9NIDO	LPLGLNITNYKVVTTLKP	TNO...AFQAAAYIVGNL	KHTTMMSFNENGTMSNA			
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tr R9QTAO R9QTAO_CVHSA	LPLGINITGMRRVMMT	MFSNTQANFLTEN	AAYYVGVLKPRRTFMILQ	FQENTNGTIVNA		
tr A0A0K1Z074 A0A0K1Z074_CVHSA	LPLFGINITSFRVV	MAAMFSKTTSNYVPES	AAYYVGVLKQSTTFMIS	LFNNGTITD		
sp Q3LZX1 SPIKE_BCHK3	LPLFGINITSFRVV	MAAMFSQTTSNFLPES	AAYYVGVLKYSTTFMIR	RFNENGTTID		
sp Q3I5J5 SPIKE_BCRP3	LPLFGINITSFRVV	MAAMFSQTTSNFLPES	AAYYVGVLKYTTTFML	SFNEENGTTINA		
sp Q0Q475 SPIKE_BC279	LPLFGINITSFRVV	MAAMFSQFNSNFLPES	AAYYVGVLKYTTTFML	SFNEENGTTINA		
tr Q0QDX9 Q0QDX9_CVHSA	LPLFGINITSFRVV	MAAMFSQFNSNFLPES	AAYYVGVLKYTTTFML	SFNEENGTTINA		
tr A0A2I4AL96 A0A2I4AL96_9TELE	.	.	.	.	.	.
tr A0A1U7RHG6 A0A1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr A0A2K5QWK6 A0A2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	290	300	310	320	330	340
sp P0DT2 SPIKE_SARS2_Spike_g1	VDCALDPLS	ETKCTLKSF	TVEKGIVYQTSNFRV	QPTESIVRFPNITNLCP	FGEVFVNATRF	A
sp P59594 SPIKE_CVHSA	VDCSQNPLAEL	KCSVKSF	EIDKGIVYQTSNFRV	VPSGDVVRFPNITNLCP	FGEVFVNATRF	P
tr D2E1E7 D2E1E7_CVHSA	VDCSQNPLAEL	KCSVKSF	EIDKGIVYQTSNFRV	VPSGDVVRFPNITNLCP	FGEVFVNATRF	P
tr D2E1D2 D2E1D2_CVHSA	VDCSQNPLAEL	KCSVKSF	EIDKGIVYQTSNFRV	VPSGDVVRFPNITNLCP	FGEVFVNATRF	P
tr A0A166ZL64 A0A166ZL64_9NIDO	IDCSQDPLAEL	KCTLQKF	DVGKGIVYQTSNFRV	QPTVDVARFPNITNVCP	FDFKVFNATRF	P
tr A0A0U1UYX4 A0A0U1UYX4_CVHSA	IDCSQDPLAEL	KCTLQKF	DVGKGIVYQTSNFRV	QPTVDVARFPNITNVCP	FDFKVFNATRF	P
tr R9QTAO R9QTAO_CVHSA	VDCSQDPLS	ELKCTLKSF	NITKGIVYQTSNFRV	QPTQEVVRFPNITNRCP	FDFKVFNATRF	P
tr A0A0K1Z074 A0A0K1Z074_CVHSA	VDCSQNPLAEL	KCTTKSF	NVSKGIVYQTSNFRV	APVTEVVRFPNITNLCP	FDFKVFNATRF	P
sp Q3LZX1 SPIKE_BCHK3	VDCSQNPLAEL	KCTIKNF	NVSKGIVYQTSNFRV	SPTQEVVRFPNITNRCP	FDFKVFNATRF	P
sp Q3I5J5 SPIKE_BCRP3	VDCSQNPLAEL	KCTIKNF	NVSKGIVYQTSNFRV	SPTQEVVRFPNITNRCP	FDFKVFNATRF	P
sp Q0Q475 SPIKE_BC279	VDCSQNPLAEL	KCTIKNF	NVSKGIVYQTSNFRV	SPTQEVVRFPNITNRCP	FDFKVFNASRF	P
tr Q0QDX9 Q0QDX9_CVHSA	VDCSQNPLAEL	KCTIKNF	NVSKGIVYQTSNFRV	SPTQEVVRFPNITNRCP	FDFKVFNASRF	P
tr A0A2I4AL96 A0A2I4AL96_9TELE	.	.	.	.	.	.
tr A0A1U7RHG6 A0A1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr A0A2K5QWK6 A0A2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	350	360	370	380	390	400
sp P0DT2 SPIKE_SARS2_Spike_g1	SVYAWNRKRISN	CVADYSVLYNS	ASFSTFKCYGVSP	PTKLN	DLCFTNVYADSFVIR	GDEVR
sp P59594 SPIKE_CVHSA	SVYAWERK	KISNCVADYSVLYNS	TFSTFKCYGVSP	ATKLN	DLCFSNVYADSFVVK	GD DVR
tr D2E1E7 D2E1E7_CVHSA	SVYAWERK	KISNCVADYSVLYNS	TFSTFKCYGVSP	ATKLN	DLCFSNVYADSFVVK	GD DVR
tr D2E1D2 D2E1D2_CVHSA	SVYAWERK	KISNCVADYSVLYNS	TFSTFKCYGVSP	ATKLN	DLCFSNVYADSFVVK	GD DVR
tr A0A166ZL64 A0A166ZL64_9NIDO	SVYAWERK	KISNCVADYSVLYNS	TFSTFKCYGVSP	ATKLN	DLCFSNVYADSFVVK	GD DVR
tr A0A0U1UYX4 A0A0U1UYX4_CVHSA	SVYAWERK	KISNCVADYSVLYNS	TFSTFKCYGVSP	ATKLN	DLCFSNVYADSFVVK	GD DVR
tr R9QTAO R9QTAO_CVHSA	SVYAWERK	KISNCVADYSVLYNS	TFSTFKCYGVSP	ATKLN	DLCFSNVYADSFVVK	GD DVR
tr A0A0K1Z074 A0A0K1Z074_CVHSA	SVYAWERK	KISNCVADYSVLYNS	TFSTFKCYGVSP	ATKLN	DLCFSNVYADSFVVK	GD DVR
sp Q3LZX1 SPIKE_BCHK3	SVYAWERK	KISNCVADYSVLYNS	TFSTFKCYGVSP	ATKLN	DLCFSNVYADSFVVK	GD DVR
sp Q3I5J5 SPIKE_BCRP3	SVYAWERK	KISNCVADYSVLYNS	TFSTFKCYGVSP	ATKLN	DLCFSNVYADSFVVK	GD DVR
sp Q0Q475 SPIKE_BC279	SVYAWERK	KISNCVADYSVLYNS	TFSTFKCYGVSP	ATKLN	DLCFSNVYADSFVVK	GD DVR
tr Q0QDX9 Q0QDX9_CVHSA	SVYAWERK	KISNCVADYSVLYNS	TFSTFKCYGVSP	ATKLN	DLCFSNVYADSFVVK	GD DVR
tr A0A2I4AL96 A0A2I4AL96_9TELE	.	.	.	.	.	.
tr A0A1U7RHG6 A0A1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr A0A2K5QWK6 A0A2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	410	420	430	440	450	460
sp P0DT2 SPIKE_SARS2_Spike_g1	QIAPGQTGK	IADYNKLPDDFT	GCVIAWSNNL	D SKVGGNYNYLYR	LFRKSNLKPFERDI	
sp P59594 SPIKE_CVHSA	QIAPGQTGV	IADYNKLPDDFT	GCVLAWNTR	RNIDATSTGNYNYK	YRYLHRHGKLRPFERDI	
tr D2E1E7 D2E1E7_CVHSA	QIAPGQTGV	IADYNKLPDDFT	GCVLAWNTR	RNIDATSTGNYNYK	YRYLHRHGKLRPFERDI	
tr D2E1D2 D2E1D2_CVHSA	QIAPGQTGV	IADYNKLPDDFT	GCVLAWNTR	RNIDATSTGNYNYK	YRYLHRHGKLRPFERDI	
tr A0A166ZL64 A0A166ZL64_9NIDO	QVAPGQTGV	IADYNKLPDDFT	GCVIAWN	AKQDQVG	SYFYRSHRSSKLKPFERDL	
tr A0A0U1UYX4 A0A0U1UYX4_CVHSA	QVAPGQTGV	IADYNKLPDDFT	GCVIAWN	AKQDQVG	SYFYRSHRSSKLKPFERDL	
tr R9QTAO R9QTAO_CVHSA	QVAPGQTGV	IADYNKLPDDFT	GCVIAWN	AKQDQVG	SYFYRSHRSSKLKPFERDL	
tr A0A0K1Z074 A0A0K1Z074_CVHSA	QVAPGQTGV	IADYNKLPDDFT	GCVIAWN	AKQDQVG	SYFYRSHRSSKLKPFERDL	
sp Q3LZX1 SPIKE_BCHK3	QVAPGQTGV	IADYNKLPDDFT	GCVIAWN	AKHDTG	NYYYRSHRKTKLKPFERDL	
sp Q3I5J5 SPIKE_BCRP3	QVAPGQTGV	IADYNKLPDDFT	GCVIAWN	AKQDQVG	SYYYRSHRKTKLKPFERDL	
sp Q0Q475 SPIKE_BC279	QVAPGQTGV	IADYNKLPDDFT	GCVIAWN	AKQDQVG	SYYYRSHRKTKLKPFERDL	
tr Q0QDX9 Q0QDX9_CVHSA	QVAPGQTGV	IADYNKLPDDFT	GCVIAWN	AKQDQVG	SYYYRSHRKTKLKPFERDL	
tr A0A2I4AL96 A0A2I4AL96_9TELE	.	.	.	.	.	.
tr A0A1U7RHG6 A0A1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr A0A2K5QWK6 A0A2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	470	480	490	500	510	520
sp P0DT2 SPIKE_SARS2_Spike_g1	STIEIYQAGSTPCNGVEGF	NCYFP <span style="color:red">LQS</span> YGFQPTN <span style="color:red">G</span> VGYQPYRVVVL <span style="color:red">S</span> FELI	HAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
sp P59594 SPIKE_CVHSA	SNVPFSPDGKPC <span style="color:red">T</span> PP	.ALNCYWP <span style="color:red">LNDY</span> G <span style="color:red">F</span> YTTTG <span style="color:red">G</span> I <span style="color:red">G</span> YQPYRVVVL <span style="color:red">S</span> FELI	NAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
tr D2E1E7 D2E1E7_CVHSA	SNVPFSPDGKPC <span style="color:red">T</span> PP	.ALNCYWP <span style="color:red">LNDY</span> G <span style="color:red">F</span> YTTTG <span style="color:red">G</span> I <span style="color:red">G</span> YQPYRVVVL <span style="color:red">S</span> FELI	NAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
tr D2E1D2 D2E1D2_CVHSA	SNVPFSPDGKPC <span style="color:red">T</span> PP	.ALNCYWP <span style="color:red">LNDY</span> G <span style="color:red">F</span> YTTTG <span style="color:red">G</span> I <span style="color:red">G</span> YQPYRVVVL <span style="color:red">S</span> FELI	NAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
tr AOA166ZL64 AOA166ZL64_9NIDO	SSE.....	.ENGVLT <span style="color:red">L</span> STYDF <span style="color:red">F</span> NQN <span style="color:red">V</span> P <span style="color:red">L</span> EYQATRVVVL <span style="color:red">S</span> FELI	NAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
tr AOA0U1UYX4 AOA0U1UYX4_CVHSA	SSE.....	.ENGVLT <span style="color:red">L</span> STYDF <span style="color:red">F</span> NQN <span style="color:red">V</span> P <span style="color:red">L</span> EYQATRVVVL <span style="color:red">S</span> FELI	NAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
tr R9QTAO R9QTAO_CVHSA	SSD.....	.ENGVLT <span style="color:red">L</span> STYDF <span style="color:red">F</span> YPSV <span style="color:red">P</span> 1D <span style="color:red">Y</span> QATRVVVL <span style="color:red">S</span> FELI	NAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
tr AOA0K1Z074 AOA0K1Z074_CVHSA	SSE.....	.ENGVLT <span style="color:red">L</span> STYDF <span style="color:red">F</span> NQN <span style="color:red">V</span> P <span style="color:red">L</span> EYQATRVVVL <span style="color:red">S</span> FELI	NAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
sp Q3LZX1 SPIKE_BCHK3	SSD.....	.GNGVYT <span style="color:red">L</span> STYDF <span style="color:red">F</span> NP <span style="color:red">N</span> P <span style="color:red">V</span> A <span style="color:red">Y</span> QATRVVVL <span style="color:red">S</span> FELI	NAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
sp Q3I5J5 SPIKE_BCRP3	SSD.....	.ENGVRT <span style="color:red">L</span> STYDF <span style="color:red">F</span> YP <span style="color:red">S</span> IP <span style="color:red">V</span> PA <span style="color:red">Y</span> QATRVVVL <span style="color:red">S</span> FELI	NAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
sp Q0Q475 SPIKE_BC279	SSD.....	.ENGVYT <span style="color:red">L</span> STYDF <span style="color:red">F</span> YPSIP <span style="color:red">V</span> EYQATRVVVL <span style="color:red">S</span> FELI	NAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
tr Q0QDX9 Q0QDX9_CVHSA	SSD.....	.ENGVYT <span style="color:red">L</span> STYDF <span style="color:red">F</span> YPSIP <span style="color:red">V</span> EYQATRVVVL <span style="color:red">S</span> FELI	NAPATVC <span style="color:red">G</span> P <span style="color:red">K</span>			
tr AOA2I4AL96 AOA2I4AL96_9TELE	.	.	.	.	.	.
tr AOA1U7RHG6 AOA1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr AOA2K5QWK6 AOA2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	530	540	550	560	570	580
sp P0DT2 SPIKE_SARS2_Spike_g1	KSTN <span style="color:red">LVKN</span> K <span style="color:red">CVNFNFNG</span> L <span style="color:red">GTGVLT</span> T <span style="color:red">E</span> SNKK <span style="color:red">F</span> LP <span style="color:red">FQOFGRD</span> I <span style="color:red">A</span> D <span style="color:red">T</span> TDA <span style="color:red">VRDP</span> QT <span style="color:red">LE</span> I <span style="color:red">LDIT</span>					
sp P59594 SPIKE_CVHSA	L <span style="color:red">STD</span> L <span style="color:red">IKNO</span> C <span style="color:red">VN</span> F <span style="color:red">NFNG</span> L <span style="color:red">GTGVLT</span> T <span style="color:red">P</span> SSK <span style="color:red">RF</span> QPF <span style="color:red">QQFGRD</span> V <span style="color:red">S</span> D <span style="color:red">FT</span> TDS <span style="color:red">VRDP</span> K <span style="color:red">T</span> SE <span style="color:red">ILDIS</span>					
tr D2E1E7 D2E1E7_CVHSA	L <span style="color:red">STD</span> L <span style="color:red">IKNO</span> C <span style="color:red">VN</span> F <span style="color:red">NFNG</span> L <span style="color:red">GTGVLT</span> T <span style="color:red">P</span> SSK <span style="color:red">RF</span> QPF <span style="color:red">QQFGRD</span> V <span style="color:red">S</span> D <span style="color:red">FT</span> TDS <span style="color:red">VRDP</span> K <span style="color:red">T</span> SE <span style="color:red">ILDIS</span>					
tr D2E1D2 D2E1D2_CVHSA	L <span style="color:red">STD</span> L <span style="color:red">IKNO</span> C <span style="color:red">VN</span> F <span style="color:red">NFNG</span> L <span style="color:red">GTGVLT</span> T <span style="color:red">P</span> SSK <span style="color:red">RF</span> QPF <span style="color:red">QQFGRD</span> V <span style="color:red">S</span> D <span style="color:red">FT</span> TDS <span style="color:red">VRDP</span> K <span style="color:red">T</span> SE <span style="color:red">ILDIS</span>					
tr AOA166ZL64 AOA166ZL64_9NIDO	L <span style="color:red">STP</span> L <span style="color:red">LVKN</span> Q <span style="color:red">CVNFNFNG</span> L <span style="color:red">K</span> GTGVLT <span style="color:red">D</span> SSK <span style="color:red">TF</span> QSF <span style="color:red">QQFGRD</span> A <span style="color:red">S</span> D <span style="color:red">FT</span> TDS <span style="color:red">VRDP</span> QTL <span style="color:red">Q</span> ILDIS					
tr AOA0U1UYX4 AOA0U1UYX4_CVHSA	L <span style="color:red">STP</span> L <span style="color:red">LVKN</span> Q <span style="color:red">CVNFNFNG</span> L <span style="color:red">K</span> GTGVLT <span style="color:red">D</span> SSK <span style="color:red">TF</span> QSF <span style="color:red">QQFGRD</span> A <span style="color:red">S</span> D <span style="color:red">FT</span> TDS <span style="color:red">VRDP</span> QTL <span style="color:red">Q</span> ILDIS					
tr R9QTAO R9QTAO_CVHSA	L <span style="color:red">STT</span> L <span style="color:red">LVKN</span> O <span style="color:red">CVNFNFNG</span> L <span style="color:red">K</span> GTGVLT <span style="color:red">T</span> ASSK <span style="color:red">KF</span> QSF <span style="color:red">QQFGRD</span> A <span style="color:red">S</span> D <span style="color:red">FT</span> TDS <span style="color:red">VRDP</span> QTL <span style="color:red">Q</span> ILDIS					
tr AOA0K1Z074 AOA0K1Z074_CVHSA	L <span style="color:red">STS</span> L <span style="color:red">LVKN</span> O <span style="color:red">CVNFNFNG</span> F <span style="color:red">K</span> GTGVLT <span style="color:red">D</span> SSK <span style="color:red">TF</span> QSF <span style="color:red">QQFGRD</span> A <span style="color:red">S</span> D <span style="color:red">FT</span> TDS <span style="color:red">VRDP</span> KT <span style="color:red">LQ</span> ILDIS					
sp Q3LZX1 SPIKE_BCHK3	L <span style="color:red">STE</span> L <span style="color:red">LVKN</span> O <span style="color:red">CVNFNFNG</span> L <span style="color:red">K</span> GTGVLT <span style="color:red">T</span> SSK <span style="color:red">RF</span> QSF <span style="color:red">QQFGRD</span> T <span style="color:red">S</span> D <span style="color:red">FT</span> TDS <span style="color:red">VRDP</span> KT <span style="color:red">LQ</span> ILDIS					
sp Q3I5J5 SPIKE_BCRP3	L <span style="color:red">STQ</span> L <span style="color:red">LVKN</span> Q <span style="color:red">CVNFNFNG</span> L <span style="color:red">K</span> GTGVLT <span style="color:red">T</span> ESSK <span style="color:red">RF</span> QSF <span style="color:red">QQFGRD</span> T <span style="color:red">S</span> D <span style="color:red">FT</span> TDS <span style="color:red">VRDP</span> KT <span style="color:red">LQ</span> ILDIS					
sp Q0Q475 SPIKE_BC279	L <span style="color:red">STQ</span> L <span style="color:red">LVKN</span> Q <span style="color:red">CVNFNFNG</span> L <span style="color:red">R</span> GTGVLT <span style="color:red">T</span> SSK <span style="color:red">RF</span> QSF <span style="color:red">QQFGRD</span> T <span style="color:red">S</span> D <span style="color:red">FT</span> TDS <span style="color:red">VRDP</span> KT <span style="color:red">LQ</span> ILDIS					
tr Q0QDX9 Q0QDX9_CVHSA	L <span style="color:red">STQ</span> L <span style="color:red">LVKN</span> Q <span style="color:red">CVNFNFNG</span> L <span style="color:red">R</span> GTGVLT <span style="color:red">T</span> SSK <span style="color:red">RF</span> QSF <span style="color:red">QQFGRD</span> T <span style="color:red">S</span> D <span style="color:red">FT</span> TDS <span style="color:red">VRDP</span> KT <span style="color:red">LQ</span> ILDIS					
tr AOA2I4AL96 AOA2I4AL96_9TELE	.	.	.	.	.	.
tr AOA1U7RHG6 AOA1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr AOA2K5QWK6 AOA2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	590	600	610	620	630	640
sp P0DT2 SPIKE_SARS2_Spike_g1	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> T <span style="color:red">S</span> N <span style="color:red">Q</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTEV</span> P <span style="color:red">V</span> A <span style="color:red">T</span> H <span style="color:red">AD</span> Q <span style="color:red">T</span> PT <span style="color:red">W</span> R <span style="color:red">VY</span> ST <span style="color:red">G</span> S <span style="color:red">N</span> V <span style="color:red">FQ</span> T <span style="color:red">R</span> AG					
sp P59594 SPIKE_CVHSA	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> A <span style="color:red">S</span> E <span style="color:red">E</span> VA <span style="color:red">V</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTDV</span> S <span style="color:red">T</span> A <span style="color:red">I</span> H <span style="color:red">AD</span> Q <span style="color:red">T</span> PT <span style="color:red">W</span> R <span style="color:red">IY</span> ST <span style="color:red">G</span> NNV <span style="color:red">FQ</span> T <span style="color:red">Q</span> AG					
tr D2E1E7 D2E1E7_CVHSA	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> A <span style="color:red">S</span> E <span style="color:red">E</span> VA <span style="color:red">V</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTDV</span> S <span style="color:red">T</span> A <span style="color:red">I</span> H <span style="color:red">AD</span> Q <span style="color:red">T</span> PT <span style="color:red">W</span> R <span style="color:red">IY</span> ST <span style="color:red">G</span> NNV <span style="color:red">FQ</span> T <span style="color:red">Q</span> AG					
tr D2E1D2 D2E1D2_CVHSA	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> A <span style="color:red">S</span> E <span style="color:red">E</span> VA <span style="color:red">V</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTDV</span> S <span style="color:red">T</span> A <span style="color:red">I</span> H <span style="color:red">AD</span> Q <span style="color:red">T</span> PT <span style="color:red">W</span> R <span style="color:red">IY</span> ST <span style="color:red">G</span> NNV <span style="color:red">FQ</span> T <span style="color:red">Q</span> AG					
tr AOA166ZL64 AOA166ZL64_9NIDO	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> T <span style="color:red">S</span> S <span style="color:red">A</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTDV</span> P <span style="color:red">T</span> T <span style="color:red">I</span> H <span style="color:red">AD</span> H <span style="color:red">L</span> TH <span style="color:red">S</span> WR <span style="color:red">VY</span> TT <span style="color:red">GP</span> YV <span style="color:red">FQ</span> T <span style="color:red">Q</span> AG					
tr AOA0U1UYX4 AOA0U1UYX4_CVHSA	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> T <span style="color:red">S</span> S <span style="color:red">A</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTDV</span> P <span style="color:red">T</span> T <span style="color:red">I</span> H <span style="color:red">AD</span> H <span style="color:red">L</span> TH <span style="color:red">S</span> WR <span style="color:red">VY</span> TT <span style="color:red">GP</span> YV <span style="color:red">FQ</span> T <span style="color:red">Q</span> AG					
tr R9QTAO R9QTAO_CVHSA	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> A <span style="color:red">S</span> E <span style="color:red">E</span> VA <span style="color:red">V</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTDV</span> P <span style="color:red">T</span> A <span style="color:red">I</span> H <span style="color:red">AD</span> Q <span style="color:red">T</span> PT <span style="color:red">W</span> R <span style="color:red">VY</span> ST <span style="color:red">G</span> INV <span style="color:red">FQ</span> T <span style="color:red">Q</span> AG					
tr AOA0K1Z074 AOA0K1Z074_CVHSA	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> T <span style="color:red">T</span> SS <span style="color:red">A</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTDV</span> P <span style="color:red">K</span> T <span style="color:red">I</span> H <span style="color:red">AD</span> Q <span style="color:red">L</span> AP <span style="color:red">S</span> WR <span style="color:red">VY</span> ST <span style="color:red">G</span> P <span style="color:red">F</span> V <span style="color:red">FQ</span> T <span style="color:red">Q</span> AG					
sp Q3LZX1 SPIKE_BCHK3	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> A <span style="color:red">S</span> E <span style="color:red">E</span> VA <span style="color:red">V</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTDV</span> P <span style="color:red">T</span> A <span style="color:red">I</span> R <span style="color:red">AD</span> Q <span style="color:red">L</span> TP <span style="color:red">A</span> WR <span style="color:red">VY</span> ST <span style="color:red">G</span> VNV <span style="color:red">FQ</span> T <span style="color:red">Q</span> AG					
sp Q3I5J5 SPIKE_BCRP3	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> A <span style="color:red">S</span> E <span style="color:red">E</span> VA <span style="color:red">V</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTDV</span> P <span style="color:red">A</span> A <span style="color:red">I</span> H <span style="color:red">AD</span> Q <span style="color:red">L</span> TP <span style="color:red">A</span> WR <span style="color:red">VY</span> ST <span style="color:red">G</span> TNNV <span style="color:red">FQ</span> T <span style="color:red">Q</span> AG					
sp Q0Q475 SPIKE_BC279	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> A <span style="color:red">S</span> E <span style="color:red">E</span> VA <span style="color:red">V</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTDV</span> P <span style="color:red">T</span> S <span style="color:red">I</span> H <span style="color:red">AD</span> Q <span style="color:red">L</span> TP <span style="color:red">A</span> WR <span style="color:red">VY</span> ST <span style="color:red">G</span> VNV <span style="color:red">FQ</span> T <span style="color:red">Q</span> AG					
tr Q0QDX9 Q0QDX9_CVHSA	PCSF <span style="color:red">GGGS</span> V <span style="color:red">S</span> IT <span style="color:red">PGTN</span> A <span style="color:red">S</span> E <span style="color:red">E</span> VA <span style="color:red">V</span> AV <span style="color:red">LY</span> QDV <span style="color:red">VNCTDV</span> P <span style="color:red">T</span> S <span style="color:red">I</span> H <span style="color:red">AD</span> Q <span style="color:red">L</span> TP <span style="color:red">A</span> WR <span style="color:red">VY</span> ST <span style="color:red">G</span> VNV <span style="color:red">FQ</span> T <span style="color:red">Q</span> AG					
tr AOA2I4AL96 AOA2I4AL96_9TELE	.	.	.	.	.	.
tr AOA1U7RHG6 AOA1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr AOA2K5QWK6 AOA2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	650	660	670	680	690	700
sp P0DT2 SPIKE_SARS2_Spike_g1	CLIGAEHVNN <span style="color:red">SY</span> E <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">Q</span> T <span style="color:red">Q</span> NSPR <span style="color:red">A</span> RS <span style="color:red">V</span> A <span style="color:red">S</span> O <span style="color:red">S</span> I <span style="color:red">I</span> AY <span style="color:red">TMSLGA</span> EN <span style="color:red">SV</span> A <span style="color:red">Y</span> S					
sp P59594 SPIKE_CVHSA	CLIGAEHVDT <span style="color:red">SY</span> E <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">HT</span> V <span style="color:red">S</span> ...LLR <span style="color:red">S</span> T <span style="color:red">Q</span> K <span style="color:red">S</span> I <span style="color:red">V</span> AY <span style="color:red">TMSLGA</span> D <span style="color:red">SSIA</span> Y <span style="color:red">S</span>					
tr D2E1E7 D2E1E7_CVHSA	CLIGAEHVDT <span style="color:red">SY</span> E <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">HT</span> V <span style="color:red">S</span> ...LLR <span style="color:red">S</span> T <span style="color:red">Q</span> K <span style="color:red">S</span> I <span style="color:red">V</span> AY <span style="color:red">TMSLGA</span> D <span style="color:red">SSIA</span> Y <span style="color:red">S</span>					
tr D2E1D2 D2E1D2_CVHSA	CLIGAEHVNA <span style="color:red">SY</span> Q <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">HT</span> A <span style="color:red">S</span> ...LLR <span style="color:red">S</span> T <span style="color:red">Q</span> K <span style="color:red">S</span> I <span style="color:red">V</span> AY <span style="color:red">TMSLGA</span> EN <span style="color:red">SV</span> A <span style="color:red">Y</span> A					
tr AOA166ZL64 AOA166ZL64_9NIDO	CLIGAEHVNA <span style="color:red">SY</span> Q <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">HT</span> A <span style="color:red">S</span> ...LLR <span style="color:red">S</span> T <span style="color:red">Q</span> K <span style="color:red">S</span> I <span style="color:red">V</span> AY <span style="color:red">TMSLGA</span> EN <span style="color:red">SV</span> A <span style="color:red">Y</span> A					
tr AOA0U1UYX4 AOA0U1UYX4_CVHSA	CLIGAEHVNA <span style="color:red">SY</span> Q <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">HT</span> A <span style="color:red">S</span> ...VLR <span style="color:red">S</span> T <span style="color:red">Q</span> K <span style="color:red">S</span> I <span style="color:red">V</span> AY <span style="color:red">TMSLGA</span> EN <span style="color:red">SV</span> A <span style="color:red">Y</span> A					
tr R9QTAO R9QTAO_CVHSA	CLIGAEHVNA <span style="color:red">SY</span> Q <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">HT</span> A <span style="color:red">S</span> ...VLR <span style="color:red">S</span> T <span style="color:red">Q</span> K <span style="color:red">S</span> I <span style="color:red">V</span> AY <span style="color:red">TMSLGA</span> EN <span style="color:red">SV</span> A <span style="color:red">Y</span> A					
tr AOA0K1Z074 AOA0K1Z074_CVHSA	CLIGAEHVNA <span style="color:red">SY</span> Q <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">HT</span> A <span style="color:red">S</span> ...VLR <span style="color:red">S</span> T <span style="color:red">Q</span> K <span style="color:red">S</span> I <span style="color:red">V</span> AY <span style="color:red">TMSLGA</span> EN <span style="color:red">SV</span> A <span style="color:red">Y</span> A					
sp Q3LZX1 SPIKE_BCHK3	CLIGAEHVNA <span style="color:red">SY</span> Q <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">HT</span> A <span style="color:red">S</span> ...VLR <span style="color:red">S</span> T <span style="color:red">Q</span> K <span style="color:red">S</span> I <span style="color:red">V</span> AY <span style="color:red">TMSLGA</span> EN <span style="color:red">SV</span> A <span style="color:red">Y</span> A					
sp Q3I5J5 SPIKE_BCRP3	CLIGAEHVNA <span style="color:red">SY</span> Q <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">HT</span> A <span style="color:red">S</span> ...VLR <span style="color:red">S</span> T <span style="color:red">Q</span> K <span style="color:red">S</span> I <span style="color:red">V</span> AY <span style="color:red">TMSLGA</span> EN <span style="color:red">SV</span> A <span style="color:red">Y</span> A					
sp Q0Q475 SPIKE_BC279	CLIGAEHVNA <span style="color:red">SY</span> Q <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">HT</span> A <span style="color:red">S</span> ...VLR <span style="color:red">S</span> T <span style="color:red">Q</span> K <span style="color:red">S</span> I <span style="color:red">V</span> AY <span style="color:red">TMSLGA</span> EN <span style="color:red">SV</span> A <span style="color:red">Y</span> A					
tr Q0QDX9 Q0QDX9_CVHSA	CLIGAEHVNA <span style="color:red">SY</span> Q <span style="color:red">CD</span> IPI <span style="color:red">GAGICAS</span> Y <span style="color:red">HT</span> A <span style="color:red">S</span> ...VLR <span style="color:red">S</span> T <span style="color:red">Q</span> K <span style="color:red">S</span> I <span style="color:red">V</span> AY <span style="color:red">TMSLGA</span> EN <span style="color:red">SV</span> A <span style="color:red">Y</span> A					
tr AOA2I4AL96 AOA2I4AL96_9TELE	.	.	.	.	.	.
tr AOA1U7RHG6 AOA1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr AOA2K5QWK6 AOA2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	710	720	730	740	750	760
sp P0DT2 SPIKE_SARS2_Spike_g1	NNSIAIPTNFTISVTTEILPVSM	TKT	SVDCTMYICGDST	EC	S	NLLQYGSFCTQLNRALT
sp P59594 SPIKE_CVHSA	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr D2E1E7 D2E1E7_CVHSA	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr D2E1D2 D2E1D2_CVHSA	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr A0A166ZL64 A0A166ZL64_9NIDO	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr A0A0U1UYX4 A0A0U1UYX4_CVHSA	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr R9QTAO R9QTAO_CVHSA	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr A0A0K1Z074 A0A0K1Z074_CVHSA	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
sp Q3LZX1 SPIKE_BCHK3	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
sp Q3I5J5 SPIKE_BCRP3	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
sp Q0Q475 SPIKE_BC279	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr Q0QDX9 Q0QDX9_CVHSA	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr A0A2I4AL96 A0A2I4AL96_9TELE	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr A0A1U7RHG6 A0A1U7RHG6_MESAU	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr HOUY28 HOUY28_CAVPO	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr A0A2K5QWK6 A0A2K5QWK6_CEBCA	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	
tr F6UG70 F6UG70_CALJA	NNNTIAIPTNFSISITTEVMPVSM	AKT	SVDCNMYICGDSTECA	N	LLQYGSFCTQLNRALS	

	770	780	790	800	810	820
sp P0DT2 SPIKE_SARS2_Spike_g1	GIAVEQDKNT	QEVFAAQVKQIYKTP	P	IKD	FGGFNFSQILPDP	KPSKRSFIEDLLFNKVTL
sp P59594 SPIKE_CVHSA	GIAAEQDRNT	REVFAAQVKQMYKTP	T	LKY	FGGFNFSQLPDP	KPTKRSFIEDLLFNKVTL
tr D2E1E7 D2E1E7_CVHSA	GIAAEQDRNT	REVFAAQVKQMYKTP	T	LKY	FGGFNFSQLPDP	KPTKRSFIEDLLFNKVTL
tr D2E1D2 D2E1D2_CVHSA	GIAAEQDRNT	REVFAAQVKQMYKTP	T	LKY	FGGFNFSQLPDP	KPTKRSFIEDLLFNKVTL
tr A0A166ZL64 A0A166ZL64_9NIDO	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
tr A0A0U1UYX4 A0A0U1UYX4_CVHSA	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
tr R9QTAO R9QTAO_CVHSA	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
tr A0A0K1Z074 A0A0K1Z074_CVHSA	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
sp Q3LZX1 SPIKE_BCHK3	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
sp Q3I5J5 SPIKE_BCRP3	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
sp Q0Q475 SPIKE_BC279	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
tr Q0QDX9 Q0QDX9_CVHSA	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
tr A0A2I4AL96 A0A2I4AL96_9TELE	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
tr A0A1U7RHG6 A0A1U7RHG6_MESAU	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
tr HOUY28 HOUY28_CAVPO	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
tr A0A2K5QWK6 A0A2K5QWK6_CEBCA	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL
tr F6UG70 F6UG70_CALJA	GIAAEQDRNT	REVFAAQVKQMYKTP	T	TIRD	FGGFNFSQLPDP	KPTKRSFIEDLLYNKVTL

	830	840	850	860	870	880	
sp P0DT2 SPIKE_SARS2_Spike_g1	ADAGFIKQYGDCLGDT	A	ARDLICAQKFNGLTVPLPLTDEMIA	QYTSA	LLA	GTITS	GWTF
sp P59594 SPIKE_CVHSA	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr D2E1E7 D2E1E7_CVHSA	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr D2E1D2 D2E1D2_CVHSA	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr A0A166ZL64 A0A166ZL64_9NIDO	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr A0A0U1UYX4 A0A0U1UYX4_CVHSA	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr R9QTAO R9QTAO_CVHSA	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr A0A0K1Z074 A0A0K1Z074_CVHSA	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
sp Q3LZX1 SPIKE_BCHK3	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
sp Q3I5J5 SPIKE_BCRP3	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
sp Q0Q475 SPIKE_BC279	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr Q0QDX9 Q0QDX9_CVHSA	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr A0A2I4AL96 A0A2I4AL96_9TELE	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr A0A1U7RHG6 A0A1U7RHG6_MESAU	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr HOUY28 HOUY28_CAVPO	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr A0A2K5QWK6 A0A2K5QWK6_CEBCA	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF
tr F6UG70 F6UG70_CALJA	ADAGFMKQYGECLGDI	A	ARDLICAQKFNGLTVPLPLTDEMIA	YTA	ALV	SGTAT	AGWTF

	890	900	910	920	930	940		
sp P0DT2 SPIKE_SARS2_Spike_g1	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	L	IANQFN	SAT	GK	TQDSLSSSTA	SAIGKL
sp P59594 SPIKE_CVHSA	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	SQ	IQESLTTS	TALGKL
tr D2E1E7 D2E1E7_CVHSA	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	SQ	IQESLTTS	TALGKL
tr D2E1D2 D2E1D2_CVHSA	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	SQ	IQESLTTS	TALGKL
tr A0A166ZL64 A0A166ZL64_9NIDO	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	TQ	IQESLTTS	TALGKL
tr A0A0U1UYX4 A0A0U1UYX4_CVHSA	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	TQ	IQESLTTS	TALGKL
tr R9QTAO R9QTAO_CVHSA	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	SQ	IQESLTTS	TALGKL
tr A0A0K1Z074 A0A0K1Z074_CVHSA	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	SQ	IQESLTTS	TALGKL
sp Q3LZX1 SPIKE_BCHK3	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	SQ	IQESLTTS	TALGKL
sp Q3I5J5 SPIKE_BCRP3	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	SQ	IQESLTTS	TALGKL
sp Q0Q475 SPIKE_BC279	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	SQ	IQESLTTS	TALGKL
tr Q0QDX9 Q0QDX9_CVHSA	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	TQ	IQESLTTS	TALGKL
tr A0A2I4AL96 A0A2I4AL96_9TELE	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	TQ	IQESLTTS	TALGKL
tr A0A1U7RHG6 A0A1U7RHG6_MESAU	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	SAT	GK	IQESLTTS	SAIGKL
tr HOUY28 HOUY28_CAVPO	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	SQ	IQESLTTS	TALGKL
tr A0A2K5QWK6 A0A2K5QWK6_CEBCA	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	SQ	IQESLTTS	TALGKL
tr F6UG70 F6UG70_CALJA	GAGAA	ALQIPFAMQMAYRFNGIGVTQNVLYENQK	O	IANQFN	KAI	SQ	IQESLTTS	TALGKL

	950	960	970	980	990	1000
sp P0DT2 SPIKE_SARS2_Spike_g1	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
sp P59594 SPIKE_CVHSA	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
tr D2E1E7 D2E1E7_CVHSA	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
tr D2E1D2 D2E1D2_CVHSA	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
tr AOA166ZL64 AOA166ZL64_9NIDO	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
tr AOA0U1UYX4 AOA0U1UYX4_CVHSA	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
tr R9QTA0 R9QTA0_CVHSA	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
tr AOA0K1Z074 AOA0K1Z074_CVHSA	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
sp Q3LZX1 SPIKE_BCHK3	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
sp Q3I5J5 SPIKE_BCRP3	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
sp Q0Q475 SPIKE_BC279	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
tr Q0QDX9 Q0QDX9_CVHSA	QDVVN	NAQALNTLVQLSSNFGAISVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYV				
tr AOA2I4AL96 AOA2I4AL96_9TELE	.	.	.	.	.	.
tr AOA1U7RHG6 AOA1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr AOA2K5QWK6 AOA2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	1010	1020	1030	1040	1050	1060
sp P0DT2 SPIKE_SARS2_Spike_g1	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	SAPHGVVFHLHTYV				
sp P59594 SPIKE_CVHSA	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	AAPHGVVFHLHTYV				
tr D2E1E7 D2E1E7_CVHSA	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	AAPHGVVFHLHTYV				
tr D2E1D2 D2E1D2_CVHSA	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	AAPHGVVFHLHTYV				
tr AOA166ZL64 AOA166ZL64_9NIDO	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	SAPHGVVFHLHTYV				
tr AOA0U1UYX4 AOA0U1UYX4_CVHSA	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	SAPHGVVFHLHTYV				
tr R9QTA0 R9QTA0_CVHSA	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	SAPHGVVFHLHTYV				
tr AOA0K1Z074 AOA0K1Z074_CVHSA	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	SAPHGVVFHLHTYV				
sp Q3LZX1 SPIKE_BCHK3	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	SAPHGVVFHLHTYV				
sp Q3I5J5 SPIKE_BCRP3	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	SAPHGVVFHLHTYV				
sp Q0Q475 SPIKE_BC279	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	SAPHGVVFHLHTYV				
tr Q0QDX9 Q0QDX9_CVHSA	TQQLIRAAEIRASANLAATKMSCEVLGQSKRVDFCGKGYHLMSPQ	SAPHGVVFHLHTYV				
tr AOA2I4AL96 AOA2I4AL96_9TELE	.	.	.	.	.	.
tr AOA1U7RHG6 AOA1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr AOA2K5QWK6 AOA2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	1070	1080	1090	1100	1110	1120
sp P0DT2 SPIKE_SARS2_Spike_g1	PAQEKNFTTAPAPAICHGKA	HFPREGGVFSNGTH	WFVTQRNFYEPQI	ITTDNTFVSGNC	DV	
sp P59594 SPIKE_CVHSA	PSQERNFTTAPAPAICHGKA	YFPREGGVVFNGTS	WFITQRNFSPQI	ITTDNTFVSGNC	DV	
tr D2E1E7 D2E1E7_CVHSA	PSQERNFTTAPAPAICHGKA	YFPREGGVVFNGTS	WFITQRNFSPQI	ITTDNTFVSGNC	DV	
tr D2E1D2 D2E1D2_CVHSA	PSQERNFTTAPAPAICHGKA	YFPREGGVVFNGTS	WFITQRNFSPQI	ITTDNTFVSGNC	DV	
tr AOA166ZL64 AOA166ZL64_9NIDO	PAQEKNFTTAPAPAICHGKA	YFPREGGVVFNGTS	WFITQRNFSPQI	ITTDNTFVAGSC	DV	
tr AOA0U1UYX4 AOA0U1UYX4_CVHSA	PAQEKNFTTAPAPAICHGKA	YFPREGGVVFNGTS	WFITQRNFSPQI	ITTDNTFVAGSC	DV	
tr R9QTA0 R9QTA0_CVHSA	PSQERNFTTAPAPAICHGKA	YFPREGGVVFNGTS	WFITQRNFSPQI	ITTDNTFVAGSC	DV	
tr AOA0K1Z074 AOA0K1Z074_CVHSA	PSQERNFTTAPAPAICHGKA	YFPREGGVVFNGTS	WFITQRNFSPQI	ITTDNTFVAGSC	DV	
sp Q3LZX1 SPIKE_BCHK3	PSQERNFTTAPAPAICHGKA	YFPREGGVVFNGTS	WFITQRNFSPQI	ITTDNTFVAGSC	DV	
sp Q3I5J5 SPIKE_BCRP3	PSQERNFTTAPAPAICHGKA	YFPREGGVVFNGTS	WFITQRNFSPQI	ITTDNTFVAGSC	DV	
sp Q0Q475 SPIKE_BC279	PSQERNFTTAPAPAICHGKA	YFPREGGVVFNGTS	WFITQRNFSPQI	ITTDNTFVAGNC	DV	
tr Q0QDX9 Q0QDX9_CVHSA	PSQERNFTTAPAPAICHGKA	YFPREGGVVFNGTS	WFITQRNFSPQI	ITTDNTFVAGNC	DV	
tr AOA2I4AL96 AOA2I4AL96_9TELE	.	.	.	.	.	.
tr AOA1U7RHG6 AOA1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr AOA2K5QWK6 AOA2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	1130	1140	1150	1160	1170	1180
sp P0DT2 SPIKE_SARS2_Spike_g1	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	NIQKEIDRLNE			
sp P59594 SPIKE_CVHSA	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	NIQKEIDRLNE			
tr D2E1E7 D2E1E7_CVHSA	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	NIQKEIDRLNE			
tr D2E1D2 D2E1D2_CVHSA	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	NIQKEIDRLNE			
tr AOA166ZL64 AOA166ZL64_9NIDO	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	DIQKEIDRLNE			
tr AOA0U1UYX4 AOA0U1UYX4_CVHSA	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	DIQKEIDRLNE			
tr R9QTA0 R9QTA0_CVHSA	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	DIQKEIDRLNE			
tr AOA0K1Z074 AOA0K1Z074_CVHSA	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	DIQKEIDRLNE			
sp Q3LZX1 SPIKE_BCHK3	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	DIQKEIDRLNE			
sp Q3I5J5 SPIKE_BCRP3	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	DIQKEIDRLNE			
sp Q0Q475 SPIKE_BC279	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	DIQKEIDRLNE			
tr Q0QDX9 Q0QDX9_CVHSA	VIGIINNTVYDPLQPELDSFK	EELDKYFKNHTSPDVDLGDISGINASVV	DIQKEIDRLNE			
tr AOA2I4AL96 AOA2I4AL96_9TELE	.	.	.	.	.	.
tr AOA1U7RHG6 AOA1U7RHG6_MESAU	.	.	.	.	.	.
tr HOUY28 HOUY28_CAVPO	.	.	.	.	.	.
tr AOA2K5QWK6 AOA2K5QWK6_CEBCA	.	.	.	.	.	.
tr F6UG70 F6UG70_CALJA	.	.	.	.	.	.

	1190	1200	1210	1220	1230
sp P0DTC2 SPIKE_SARS2_Spike_g1	VAKNLNESLIDLQELGKYEQYIK			WPWYIWVLGFIAGLIAIVMV	TIML
sp P59594 SPIKE_CVHSA	VAKNLNESLIDLQELGKYEQYIK			WPWYIWVLGFIAGLIAIVMV	TILL
tr D2E1E7 D2E1E7_CVHSA	VAKNLNESLIDLQELGKYEQYIK			WPWYVWLGFIAGLIAIVMV	TILL
tr D2E1D2 D2E1D2_CVHSA	VAKNLNESLIDLQELGKYEQYIK			WPWYVWLGFIAGLIAIVMV	TILL
tr AOA166ZL64 AOA166ZL64_9NIDO	VAKNLNESLIDLQELGKYEQYIK			WPWYVWLGFIAGLVGLFM	MAI TILL
tr AOA0U1UX4 AOA0U1UX4_CVHSA	VAKNLNESLIDLQELGKYEQYIK			WPWYVWLGFIAGLVGLFM	MAI TILL
tr R9QTA0 R9QTA0_CVHSA	VAKNLNESLIDLQELGKYEQYIK			WPWYVWLGFIAGLIAIVMV	TILL
tr AOA1D1Z074 AOA1D1Z074_CVHSA	VAKNLNDLSIDLQELGKYEQYIK			WPWYVWLGFIAGLVGLFM	MAI TILL
sp Q3LZX1 SPIKE_BCHK3	VAKNLNESLIDLQELGKYEQYIK			WPWYVWLGFIAGLVGLFM	MAI TILL
sp Q315J5 SPIKE_BCRP3	VAKNLNESLIDLQELGKYEQYIK			WPWYVWLGFIAGLIAIVMV	TILL
sp Q0Q475 SPIKE_BC279	VAKNLNESLIDLQELGKYEQYIK			WPWYVWLGFIAGLIAIVMV	TILL
tr Q0QDX9 Q0QDX9_CVHSA	VAKNLNESLIDLQELGKYEQYIK			WPWYVWLGFIAGLIAIVMV	TILL
tr AOA2I4AL96 AOA2I4AL96_9TELE	.....			.....	
tr AOA1U7RHG6 AOA1U7RHG6_MESAU	.....			.....	
tr HOUY28 HOUY28_CAVPO	..... M TCCGCSSGGCGSSCG			..... MGCPGDCL .....	CC VPV
tr AOA2K5QWK6 AOA2K5QWK6_CEBCA	VA .. APEAVAXCGSCGGCGS ..			..... GCGSS .....	
tr F6UG70 F6UG70_CALJA	..... MGCCGCSSGGCGSSCG			..... GCGGC . SCGGCGSSCGCGSCGCGC GYVPMCCC KPV	

		1240	1250	1260	1270
sp P0DTIC2 SPIKE_SARS2_Spike_g1	C	CMT	SCCSC	LKGCC	
sp P59594 SPIKE_CVHSA	C	CMT	SCCSC	LKGAC	
tr D2E1E7 D2E1E7_CVHSA	C	CMT	SCCSC	LKGAC	
tr D2E1D2 D2E1D2_CVHSA	C	CMT	SCCSC	LKGAC	
tr AOA166ZL64 AOA166ZL64_9NIDO	C	YFT	SCCSC	KGGM	
tr AOA0U1UYX4 AOA0U1UYX4_CVHSA	C	YFT	SCCSC	KGGM	
tr R9QTA0 R9QTA0_CVHSA	C	CMT	SCCSC	LKGAC	
tr AOAK01Z074 AOAK01Z074_CVHSA	C	YFT	SCCSC	KGGM	
sp Q3LZX1 SPIKE_BCHK3	C	CMT	SCCSC	LKGAC	
sp Q3I5J5 SPIKE_BCRP3	C	CMT	SCCSC	LKGAC	
sp Q0Q475 SPIKE_BC279	C	CMT	SCCSC	LKGAC	
tr Q0QDX9 Q0QDX9_CVHSA	C	CMT	SCCSC	LKGAC	
tr AOA214AL96 AOA214AL96_9TELE	.	.	.	.	
tr AOA1U7RHG6 AOA1U7RHG6_MESAU	.	NCCSQE	QDCCE	EEEECCQQGCCSCCGSCCG	CGS
tr HOUY28 HOUY28_CAVPO	C	CCVPAC	SCS	GKG	CGS
tr AOA2K5QWK6 AOA2K5QWK6_CEBCA	C	CCVPAC	SCSTS	CG	GGYKGCGCG
tr F6UG70 F6UG70_CALJA	C	CCVPAC	SCSSCG	.	KGG
				SC	GGSKGGCGSCG
				SC	GGSGKGCGSCGC
					QOSS

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sp|P0DTC2|SPIKE_SARS2_Spike_g1 . . . .
sp|P59594|SPIKE_CVHSA . . . .
tr|D2E1E7|D2E1E7_CVHSA . . . .
tr|D2E1D2|D2E1D2_CVHSA . . . .
tr|AOA166ZL64|AOA166ZL64_9NIDO . . . .
tr|AOA0U1UYX4|AOA0U1UYX4_CVHSA . . . .
tr|R9QTA0|R9QTA0_CVHSA . . . .
tr|AOAOK1Z074|AOAOK1Z074_CVHSA . . . .
sp|Q3LZX1|SPIKE_BCHK3 . . . .
sp|Q3I5J5|SPIKE_BCRP3 . . . .
sp|Q0Q475|SPIKE_BC279 . . . .
tr|Q0QDX9|Q0QDX9_CVHSA . . . .
tr|AOA2I4AL96|AOA2I4AL96_9TELE LQSCCLQSCLKSCCLTCVLESCLQSCCLKSCCLQSCCLQSCCLQSCCLKSCLKS
tr|AOA1U7RHG6|AOA1U7RHG6_MESAU CKPCCCCQSSCCCNCC . . . .
tr|HOUY28|HOUY28_CAVP . . . .
tr|AOA2K5QWK6|AOA2K5QWK6_CEBCA C . . . .
tr|F6UG70|F6UG70_CALJA CKPCCCSQSS...CC . . . .

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sp|P0DT2|SPIKE\_SARS2\_Spike\_g1 .  
sp|P59594|SPIKE\_CVHSA .  
tr|D2E1E7|D2E1E7\_CVHSA .  
tr|D2E1D2|D2E1D2\_CVHSA .  
tr|A0A166ZL64|A0A166ZL64\_9NIDO .  
tr|A0A0U1UYX4|A0A0U1UYX4\_CVHSA .  
tr|R9QTA0|R9QTA0\_CVHSA .  
tr|A0A0K1Z074|A0A0K1Z074\_CVHSA .  
sp|Q3LZX1|SPIKE\_BCHK3 .  
sp|Q3I5J5|SPIKE\_BCRP3 .  
sp|Q0Q475|SPIKE\_BC279 .  
tr|Q0QDX9|Q0QDX9\_CVHSA .  
tr|A0A2I4AL96|A0A2I4AL96\_9TELE CCSCCLQSCCLQSCCLQS .  
tr|A0A1URHG6|A0A1URHG6\_MESAU .  
tr|HOUY28|HOUY28\_CAVPO .  
tr|A0A2K5QWK6|A0A2K5QWK6\_CEBCA CCQCKI .  
tr|F6UG70|F6UG70\_CALJA CCQCKI .