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Ile Ser Pro Cys Ser Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr  
 580 585 590  
 Asn Ala Ser Ser Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr  
 595 600 605  
 Asp Val Pro Thr Ala Ile Arg Ala Asp Gln Leu Thr Pro Ala Trp Arg  
 610 615 620  
 Val Tyr Ser Thr Gly Val Asn Val Phe Gln Thr Gln Ala Gly Cys Leu  
 625 630 635 640  
 Ile Gly Ala Glu His Val Asn Ala Ser Tyr Glu Cys Asp Ile Pro Ile  
 645 650 655  
 Gly Ala Gly Ile Cys Ala Ser Tyr His Thr Ala Ser Val Leu Arg Ser  
 660 665 670  
 Thr Gly Gln Lys Ser Ile Val Ala Tyr Thr Met Ser Leu Gly Ala Glu  
 675 680 685  
 Asn Ser Ile Ala Tyr Ala Asn Asn Ser Ile Ala Ile Pro Thr Asn Phe  
 690 695 700  
 Ser Ile Ser Val Thr Thr Glu Val Met Pro Val Ser Met Ala Lys Thr  
 705 710 715 720  
 Ala Val Asp Cys Thr Met Tyr Ile Cys Gly Asp Ser Leu Glu Cys Ser  
 725 730 735  
 Asn Leu Leu Leu Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala  
 740 745 750  
 Leu Thr Gly Ile Ala Ile Glu Gln Asp Lys Asn Thr Gln Glu Val Phe  
 755 760 765  
 Ala Gln Val Lys Gln Met Tyr Lys Thr Pro Ala Ile Lys Asp Phe Gly  
 770 775 780  
 Gly Phe Asn Phe Ser Gln Ile Leu Pro Asp Pro Ser Lys Pro Thr Lys  
 785 790 795 800  
 Arg Ser Phe Ile Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp  
 805 810 815  
 Ala Gly Phe Met Lys Gln Tyr Gly Asp Cys Leu Gly Asp Val Ser Ala  
 820 825 830  
 Arg Asp Leu Ile Cys Ala Gln Lys Phe Asn Gly Leu Thr Val Leu Pro  
 835 840 845  
 Pro Leu Leu Thr Asp Glu Met Val Ala Ala Tyr Thr Ala Ala Leu Val  
 850 855 860  
 Ser Gly Thr Ala Thr Ala Gly Trp Thr Phe Gly Ala Gly Ser Ala Leu  
 865 870 875 880  
 Gln Ile Pro Phe Ala Met Gln Met Ala Tyr Arg Phe Asn Gly Ile Gly  
 885 890 895  
 Val Thr Gln Asn Val Leu Tyr Glu Asn Gln Lys Gln Ile Ala Asn Gln  
 900 905 910  
 Phe Asn Lys Ala Ile Ser Gln Ile Gln Glu Ser Leu Thr Thr Thr Ser  
 915 920 925  
 Thr Ala Leu Gly Lys Leu Gln Asp Val Val Asn Asp Asn Ala Gln Ala  
 930 935 940  
 Leu Asn Thr Leu Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser  
 945 950 955 960  
 Ser Val Leu Asn Asp Ile Leu Ser Arg Leu Asp Lys Val Glu Ala Glu  
 965 970 975  
 Val Gln Ile Asp Arg Leu Ile Thr Gly Arg Leu Gln Ser Leu Gln Thr  
 980 985 990  
 Tyr Val Thr Gln Gln Leu Ile Arg Ala Ala Glu Ile Arg Ala Ser Ala

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995	1000	1005
Asn Leu Ala Ala Thr Lys Met 1010	Ser Glu Cys Val 1015	Leu Gly Gln Ser 1020
Lys Arg Val Asp Phe Cys Gly 1025	Lys Gly Tyr His 1030	Leu Met Ser Phe 1035
Pro Gln Ala Ala Pro His Gly 1040	Val Val Phe Leu 1045	His Val Thr Tyr 1050
Val Pro Ser Gln Glu Arg Asn 1055	Phe Thr Thr Ala 1060	Pro Ala Ile Cys 1065
His Glu Gly Lys Ala Tyr Phe 1070	Pro Arg Glu Gly 1075	Val Phe Val Ser 1080
Asn Gly Thr Ser Trp Phe Ile 1085	Thr Gln Arg Asn 1090	Phe Tyr Ser Pro 1095
Gln Ile Ile Thr Thr Asp Asn 1100	Thr Phe Val Ala 1105	Gly Asn Cys Asp 1110
Val Val Ile Gly Ile Ile Asn 1115	Asn Thr Val Tyr 1120	Asp Pro Leu Gln 1125
Pro Glu Leu Asp Ser Phe Lys 1130	Glu Glu Leu Asp 1135	Lys Tyr Phe Lys 1140
Asn His Thr Ser Pro Asp Val 1145	Asp Leu Gly Asp 1150	Ile Ser Gly Ile 1155
Asn Ala Ser Val Val Asn Ile 1160	Gln Lys Glu Ile 1165	Asp Arg Leu Asn 1170
Glu Val Ala Lys Asn Leu Asn 1175	Glu Ser Leu Ile 1180	Asp Leu Gln Glu 1185
Leu Gly Lys Tyr Glu Gln Tyr 1190	Ile Lys Trp Pro 1195	Trp Tyr Val Trp 1200
Leu Gly Phe Ile Ala Gly Leu 1205	Ile Ala Ile Val 1210	Met Val Thr Ile 1215
Leu Leu Cys Cys Met Thr Ser 1220	Cys Cys Ser Cys 1225	Leu Lys Gly Ala 1230
Cys Ser Cys Gly Ser Cys Cys 1235	Lys Phe Asp Glu 1240	Asp Asp Ser Glu 1245
Pro Val Leu Lys Gly Val Lys 1250	Leu His Tyr Thr 1255	

<210> SEQ ID NO 2  
 <211> LENGTH: 1242  
 <212> TYPE: PRT  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: SARS coronavirus

<400> SEQUENCE: 2

Met Lys Ile Leu Ile Phe Ala Phe Leu Ala Asn Leu Ala Lys Ala Gln 1 5 10 15
Glu Gly Cys Gly Ile Ile Ser Arg Lys Pro Gln Pro Lys Met Ala Gln 20 25 30
Val Ser Ser Ser Arg Arg Gly Val Tyr Tyr Asn Asp Asp Ile Phe Arg 35 40 45
Ser Asp Val Leu His Leu Thr Gln Asp Tyr Phe Leu Pro Phe Asp Ser 50 55 60
Asn Leu Thr Gln Tyr Phe Ser Leu Asn Val Asp Ser Asp Arg Tyr Thr 65 70 75 80
Tyr Phe Asp Asn Pro Ile Leu Asp Phe Gly Asp Gly Val Tyr Phe Ala

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85					90					95					
Ala	Thr	Glu	Lys	Ser	Asn	Val	Ile	Arg	Gly	Trp	Ile	Phe	Gly	Ser	Ser
			100						105					110	
Phe	Asp	Asn	Thr	Thr	Gln	Ser	Ala	Val	Ile	Val	Asn	Asn	Ser	Thr	His
		115						120						125	
Ile	Ile	Ile	Arg	Val	Cys	Asn	Phe	Asn	Leu	Cys	Lys	Glu	Pro	Met	Tyr
		130						135						140	
Thr	Val	Ser	Arg	Gly	Thr	Gln	Gln	Asn	Ala	Trp	Val	Tyr	Gln	Ser	Ala
								150						155	
Phe	Asn	Cys	Thr	Tyr	Asp	Arg	Val	Glu	Lys	Ser	Phe	Gln	Leu	Asp	Thr
				165										170	
Thr	Pro	Lys	Thr	Gly	Asn	Phe	Lys	Asp	Leu	Arg	Glu	Tyr	Val	Phe	Lys
				180					185					190	
Asn	Arg	Asp	Gly	Phe	Leu	Ser	Val	Tyr	Gln	Thr	Tyr	Thr	Ala	Val	Asn
			195						200					205	
Leu	Pro	Arg	Gly	Leu	Pro	Thr	Gly	Phe	Ser	Val	Leu	Lys	Pro	Ile	Leu
			210						215					220	
Lys	Leu	Pro	Phe	Gly	Ile	Asn	Ile	Thr	Ser	Tyr	Arg	Val	Val	Met	Ala
									230					235	
Met	Phe	Ser	Gln	Thr	Thr	Ser	Asn	Phe	Leu	Pro	Glu	Ser	Ala	Ala	Tyr
				245										250	
Tyr	Val	Gly	Asn	Leu	Lys	Tyr	Ser	Thr	Phe	Met	Leu	Arg	Phe	Asn	Glu
				260					265					270	
Asn	Gly	Thr	Ile	Thr	Asp	Ala	Val	Asp	Cys	Ser	Gln	Asn	Pro	Leu	Ala
				275					280					285	
Glu	Leu	Lys	Cys	Thr	Ile	Lys	Asn	Phe	Asn	Val	Asp	Lys	Gly	Ile	Tyr
				290					295					300	
Gln	Thr	Ser	Asn	Phe	Arg	Val	Ser	Pro	Thr	Gln	Glu	Val	Ile	Arg	Phe
									310					315	
Pro	Asn	Ile	Thr	Asn	Arg	Cys	Pro	Phe	Asp	Lys	Val	Phe	Asn	Ala	Thr
				325										330	
Arg	Phe	Pro	Asn	Val	Tyr	Ala	Trp	Glu	Arg	Thr	Lys	Ile	Ser	Asp	Cys
				340					345					350	
Val	Ala	Asp	Tyr	Thr	Val	Leu	Tyr	Asn	Ser	Thr	Ser	Phe	Ser	Thr	Phe
				355					360					365	
Lys	Cys	Tyr	Gly	Val	Ser	Pro	Ser	Lys	Leu	Ile	Asp	Leu	Cys	Phe	Thr
				370					375					380	
Ser	Val	Tyr	Ala	Asp	Thr	Phe	Leu	Ile	Arg	Ser	Ser	Glu	Val	Arg	Gln
									390					395	
Val	Ala	Pro	Gly	Glu	Thr	Gly	Val	Ile	Ala	Asp	Tyr	Asn	Tyr	Lys	Leu
				405					410					415	
Pro	Asp	Asp	Phe	Thr	Gly	Cys	Val	Ile	Ala	Trp	Asn	Thr	Ala	Lys	His
				420					425					430	
Asp	Thr	Gly	Asn	Tyr	Tyr	Tyr	Arg	Ser	His	Arg	Lys	Thr	Lys	Leu	Lys
				435					440					445	
Pro	Phe	Glu	Arg	Asp	Leu	Ser	Ser	Asp	Asp	Gly	Asn	Gly	Val	Tyr	Thr
									455					460	
Leu	Ser	Thr	Tyr	Asp	Phe	Asn	Pro	Asn	Val	Pro	Val	Ala	Tyr	Gln	Ala
									470					475	
Thr	Arg	Val	Val	Val	Leu	Ser	Phe	Glu	Leu	Leu	Asn	Ala	Pro	Ala	Thr
									485					490	
Val	Cys	Gly	Pro	Lys	Leu	Ser	Thr	Glu	Leu	Val	Lys	Asn	Gln	Cys	Val
				500					505					510	

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Asn Phe Asn Phe Asn Gly Leu Lys Gly Thr Gly Val Leu Thr Ser Ser  
515 520 525

Ser Lys Arg Phe Gln Ser Phe Gln Gln Phe Gly Arg Asp Thr Ser Asp  
530 535 540

Phe Thr Asp Ser Val Arg Asp Pro Gln Thr Leu Glu Ile Leu Asp Ile  
545 550 555 560

Ser Pro Cys Ser Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr Asn  
565 570 575

Ala Ser Ser Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr Asp  
580 585 590

Val Pro Thr Ala Ile Arg Ala Asp Gln Leu Thr Pro Ala Trp Arg Val  
595 600 605

Tyr Ser Thr Gly Val Asn Val Phe Gln Thr Gln Ala Gly Cys Leu Ile  
610 615 620

Gly Ala Glu His Val Asn Ala Ser Tyr Glu Cys Asp Ile Pro Ile Gly  
625 630 635 640

Ala Gly Ile Cys Ala Ser Tyr His Thr Ala Ser Val Leu Arg Ser Thr  
645 650 655

Gly Gln Lys Ser Ile Val Ala Tyr Thr Met Ser Leu Gly Ala Glu Asn  
660 665 670

Ser Ile Ala Tyr Ala Asn Asn Ser Ile Ala Ile Pro Thr Asn Phe Ser  
675 680 685

Ile Ser Val Thr Thr Glu Val Met Pro Val Ser Met Ala Lys Thr Ala  
690 695 700

Val Asp Cys Thr Met Tyr Ile Cys Gly Asp Ser Leu Glu Cys Ser Asn  
705 710 715 720

Leu Leu Leu Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala Leu  
725 730 735

Thr Gly Ile Ala Ile Glu Gln Asp Lys Asn Thr Gln Glu Val Phe Ala  
740 745 750

Gln Val Lys Gln Met Tyr Lys Thr Pro Ala Ile Lys Asp Phe Gly Gly  
755 760 765

Phe Asn Phe Ser Gln Ile Leu Pro Asp Pro Ser Lys Pro Thr Lys Arg  
770 775 780

Ser Phe Ile Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp Ala  
785 790 795 800

Gly Phe Met Lys Gln Tyr Gly Asp Cys Leu Gly Asp Val Ser Ala Arg  
805 810 815

Asp Leu Ile Cys Ala Gln Lys Phe Asn Gly Leu Thr Val Leu Pro Pro  
820 825 830

Leu Leu Thr Asp Glu Met Val Ala Ala Tyr Thr Ala Ala Leu Val Ser  
835 840 845

Gly Thr Ala Thr Ala Gly Trp Thr Phe Gly Ala Gly Ala Ala Leu Gln  
850 855 860

Ile Pro Phe Ala Met Gln Met Ala Tyr Arg Phe Asn Gly Ile Gly Val  
865 870 875 880

Thr Gln Asn Val Leu Tyr Glu Asn Gln Lys Leu Ile Ala Asn Gln Phe  
885 890 895

Asn Ser Ala Ile Gly Lys Ile Gln Glu Ser Leu Ser Ser Thr Ala Ser  
900 905 910

Ala Leu Gly Lys Leu Gln Asp Val Val Asn Gln Asn Ala Gln Ala Leu  
915 920 925

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Asn Thr Leu Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser Ser  
 930 935 940  
 Val Leu Asn Asp Ile Leu Ser Arg Leu Asp Lys Val Glu Ala Glu Val  
 945 950 955 960  
 Gln Ile Asp Arg Leu Ile Thr Gly Arg Leu Gln Ser Leu Gln Thr Tyr  
 965 970 975  
 Val Thr Gln Gln Leu Ile Arg Ala Ala Glu Ile Arg Ala Ser Ala Asn  
 980 985 990  
 Leu Ala Ala Thr Lys Met Ser Glu Cys Val Leu Gly Gln Ser Lys Arg  
 995 1000 1005  
 Val Asp Phe Cys Gly Lys Gly Tyr His Leu Met Ser Phe Pro Gln  
 1010 1015 1020  
 Ser Ala Pro His Gly Val Val Phe Leu His Val Thr Tyr Val Pro  
 1025 1030 1035  
 Ser Gln Glu Lys Asn Phe Thr Thr Ala Pro Ala Ile Cys His Glu  
 1040 1045 1050  
 Gly Lys Ala Tyr Phe Pro Arg Glu Gly Val Phe Val Ser Asn Gly  
 1055 1060 1065  
 Thr Ser Trp Phe Ile Thr Gln Arg Asn Phe Tyr Ser Pro Gln Leu  
 1070 1075 1080  
 Ile Thr Thr Asp Asn Thr Phe Val Ser Gly Asn Cys Asp Val Val  
 1085 1090 1095  
 Ile Gly Ile Ile Asn Asn Thr Val Tyr Asp Pro Leu Gln Pro Glu  
 1100 1105 1110  
 Leu Asp Ser Phe Lys Glu Glu Leu Asp Lys Tyr Phe Lys Asn His  
 1115 1120 1125  
 Thr Ser Pro Asp Val Asp Leu Gly Asp Ile Ser Gly Ile Asn Ala  
 1130 1135 1140  
 Ser Val Val Asn Ile Gln Lys Glu Ile Asp Arg Leu Asn Glu Val  
 1145 1150 1155  
 Ala Lys Asn Leu Asn Glu Ser Leu Ile Asp Leu Gln Glu Leu Gly  
 1160 1165 1170  
 Lys Tyr Glu Gln Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu Gly  
 1175 1180 1185  
 Phe Ile Ala Gly Leu Ile Ala Ile Val Met Val Thr Ile Leu Leu  
 1190 1195 1200  
 Cys Cys Met Thr Ser Cys Cys Ser Cys Leu Lys Gly Ala Cys Ser  
 1205 1210 1215  
 Cys Gly Ser Cys Cys Lys Phe Asp Glu Asp Asp Ser Glu Pro Val  
 1220 1225 1230  
 Leu Lys Gly Val Lys Leu His Tyr Thr  
 1235 1240

<210> SEQ ID NO 3  
 <211> LENGTH: 1255  
 <212> TYPE: PRT  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: SARS coronavirus

<400> SEQUENCE: 3

Met Phe Ile Phe Leu Leu Phe Leu Thr Leu Thr Ser Gly Ser Asp Leu  
 1 5 10 15  
 Asp Arg Cys Thr Thr Phe Asp Asp Val Gln Ala Pro Asn Tyr Thr Gln  
 20 25 30

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His Thr Ser Ser Met Arg Gly Val Tyr Tyr Pro Asp Glu Ile Phe Arg  
 35 40 45  
 Ser Asp Thr Leu Tyr Leu Thr Gln Asp Leu Phe Leu Pro Phe Tyr Ser  
 50 55 60  
 Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe Gly Asn Pro Val  
 65 70 75 80  
 Ile Pro Phe Lys Asp Gly Ile Tyr Phe Ala Ala Thr Glu Lys Ser Asn  
 85 90 95  
 Val Val Arg Gly Trp Val Phe Gly Ser Thr Met Asn Asn Lys Ser Gln  
 100 105 110  
 Ser Val Ile Ile Ile Asn Asn Ser Thr Asn Val Val Ile Arg Ala Cys  
 115 120 125  
 Asn Phe Glu Leu Cys Asp Asn Pro Phe Phe Ala Val Ser Lys Pro Met  
 130 135 140  
 Gly Thr Gln Thr His Thr Met Ile Phe Asp Asn Ala Phe Asn Cys Thr  
 145 150 155 160  
 Phe Glu Tyr Ile Ser Asp Ala Phe Ser Leu Asp Val Ser Glu Lys Ser  
 165 170 175  
 Gly Asn Phe Lys His Leu Arg Glu Phe Val Phe Lys Asn Lys Asp Gly  
 180 185 190  
 Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp Val Val Arg Asp  
 195 200 205  
 Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe Lys Leu Pro Leu  
 210 215 220  
 Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr Ala Phe Ser Pro  
 225 230 235 240  
 Ala Gln Asp Ile Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr  
 245 250 255  
 Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile  
 260 265 270  
 Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys  
 275 280 285  
 Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn  
 290 295 300  
 Phe Arg Val Val Pro Ser Gly Asp Val Val Arg Phe Pro Asn Ile Thr  
 305 310 315 320  
 Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr Lys Phe Pro Ser  
 325 330 335  
 Val Tyr Ala Trp Glu Arg Lys Lys Ile Ser Asn Cys Val Ala Asp Tyr  
 340 345 350  
 Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe Lys Cys Tyr Gly  
 355 360 365  
 Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala  
 370 375 380  
 Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly  
 385 390 395 400  
 Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe  
 405 410 415  
 Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser  
 420 425 430  
 Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu  
 435 440 445  
 Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly



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Ala Met Gln Met Ala Tyr Arg Phe Asn Gly Ile Gly Val Thr Gln Asn  
885 890 895

Val Leu Tyr Glu Asn Gln Lys Gln Ile Ala Asn Gln Phe Asn Lys Ala  
900 905 910

Ile Ser Gln Ile Gln Glu Ser Leu Thr Thr Thr Ser Thr Ala Leu Gly  
915 920 925

Lys Leu Gln Asp Val Val Asn Gln Asn Ala Gln Ala Leu Asn Thr Leu  
930 935 940

Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser Ser Val Leu Asn  
945 950 955 960

Asp Ile Leu Ser Arg Leu Asp Lys Val Glu Ala Glu Val Gln Ile Asp  
965 970 975

Arg Leu Ile Thr Gly Arg Leu Gln Ser Leu Gln Thr Tyr Val Thr Gln  
980 985 990

Gln Leu Ile Arg Ala Ala Glu Ile Arg Ala Ser Ala Asn Leu Ala Ala  
995 1000 1005

Thr Lys Met Ser Glu Cys Val Leu Gly Gln Ser Lys Arg Val Asp  
1010 1015 1020

Phe Cys Gly Lys Gly Tyr His Leu Met Ser Phe Pro Gln Ala Ala  
1025 1030 1035

Pro His Gly Val Val Phe Leu His Val Thr Tyr Val Pro Ser Gln  
1040 1045 1050

Glu Arg Asn Phe Thr Thr Ala Pro Ala Ile Cys His Glu Gly Lys  
1055 1060 1065

Ala Tyr Phe Pro Arg Glu Gly Val Phe Val Phe Asn Gly Thr Ser  
1070 1075 1080

Trp Phe Ile Thr Gln Arg Asn Phe Phe Ser Pro Gln Ile Ile Thr  
1085 1090 1095

Thr Asp Asn Thr Phe Val Ser Gly Asn Cys Asp Val Val Ile Gly  
1100 1105 1110

Ile Ile Asn Asn Thr Val Tyr Asp Pro Leu Gln Pro Glu Leu Asp  
1115 1120 1125

Ser Phe Lys Glu Glu Leu Asp Lys Tyr Phe Lys Asn His Thr Ser  
1130 1135 1140

Pro Asp Val Asp Leu Gly Asp Ile Ser Gly Ile Asn Ala Ser Val  
1145 1150 1155

Val Asn Ile Gln Lys Glu Ile Asp Arg Leu Asn Glu Val Ala Lys  
1160 1165 1170

Asn Leu Asn Glu Ser Leu Ile Asp Leu Gln Glu Leu Gly Lys Tyr  
1175 1180 1185

Glu Gln Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu Gly Phe Ile  
1190 1195 1200

Ala Gly Leu Ile Ala Ile Val Met Val Thr Ile Leu Leu Cys Cys  
1205 1210 1215

Met Thr Ser Cys Cys Ser Cys Leu Lys Gly Ala Cys Ser Cys Gly  
1220 1225 1230

Ser Cys Cys Lys Phe Asp Glu Asp Asp Ser Glu Pro Val Leu Lys  
1235 1240 1245

Gly Val Lys Leu His Tyr Thr  
1250 1255

&lt;210&gt; SEQ ID NO 4

&lt;211&gt; LENGTH: 1241



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<212> TYPE: PRT
<213> ORGANISM: Artificial
<220> FEATURE:
<223> OTHER INFORMATION: SARS coronavirus

<400> SEQUENCE: 4

Met Lys Val Leu Ile Phe Ala Leu Leu Phe Ser Leu Ala Lys Ala Gln
 1           5           10          15
Glu Gly Cys Gly Ile Ile Ser Arg Lys Pro Gln Pro Lys Met Glu Lys
 20          25          30
Val Ser Ser Ser Arg Arg Gly Val Tyr Tyr Asn Asp Asp Ile Phe Arg
 35          40          45
Ser Asp Val Leu His Leu Thr Gln Asp Tyr Phe Leu Pro Phe Asp Ser
 50          55          60
Asn Leu Thr Gln Tyr Phe Ser Leu Asn Ile Asp Ser Asn Lys Tyr Thr
 65          70          75          80
Tyr Phe Asp Asn Pro Ile Leu Asp Phe Gly Asp Gly Val Tyr Phe Ala
 85          90          95
Ala Thr Glu Lys Ser Asn Val Ile Arg Gly Trp Ile Phe Gly Ser Ser
 100         105         110
Phe Asp Asn Thr Thr Gln Ser Ala Ile Ile Val Asn Asn Ser Thr His
 115         120         125
Ile Ile Ile Arg Val Cys Asn Phe Asn Leu Cys Lys Glu Pro Met Tyr
 130         135         140
Thr Val Ser Lys Gly Thr Gln Gln Ser Ser Trp Val Tyr Gln Ser Ala
 145         150         155         160
Phe Asn Cys Thr Tyr Asp Arg Val Glu Lys Ser Phe Gln Leu Asp Thr
 165         170         175
Ala Pro Lys Thr Gly Asn Phe Lys Asp Leu Arg Glu Tyr Val Phe Lys
 180         185         190
Asn Arg Asp Gly Phe Leu Ser Val Tyr Gln Thr Tyr Thr Ala Val Asn
 195         200         205
Leu Pro Arg Gly Phe Pro Ala Gly Phe Ser Val Leu Arg Pro Ile Leu
 210         215         220
Lys Leu Pro Phe Gly Ile Asn Ile Thr Ser Tyr Arg Val Val Met Thr
 225         230         235         240
Met Phe Ser Gln Phe Asn Ser Asn Phe Leu Pro Glu Ser Ala Ala Tyr
 245         250         255
Tyr Val Gly Asn Leu Lys Tyr Thr Thr Phe Met Leu Ser Phe Asn Glu
 260         265         270
Asn Gly Thr Ile Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala
 275         280         285
Glu Leu Lys Cys Thr Ile Lys Asn Phe Asn Val Ser Lys Gly Ile Tyr
 290         295         300
Gln Thr Ser Asn Phe Arg Val Thr Pro Thr Gln Glu Val Val Arg Phe
 305         310         315         320
Pro Asn Ile Thr Asn Arg Cys Pro Phe Asp Lys Val Phe Asn Ala Ser
 325         330         335
Arg Phe Pro Asn Val Tyr Ala Trp Glu Arg Thr Lys Ile Ser Asp Cys
 340         345         350
Val Ala Asp Tyr Thr Val Leu Tyr Asn Ser Thr Ser Phe Ser Thr Phe
 355         360         365
Lys Cys Tyr Gly Val Ser Pro Ser Lys Leu Ile Asp Leu Cys Phe Thr
 370         375         380

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Ser Val Tyr Ala Asp Thr Phe Leu Ile Arg Ser Ser Glu Val Arg Gln  
 385 390 395 400  
 Val Ala Pro Gly Glu Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu  
 405 410 415  
 Pro Asp Asp Phe Thr Gly Cys Val Ile Ala Trp Asn Thr Ala Gln Gln  
 420 425 430  
 Asp Gln Gly Gln Tyr Tyr Tyr Arg Ser Tyr Arg Lys Glu Lys Leu Lys  
 435 440 445  
 Pro Phe Glu Arg Asp Leu Ser Ser Asp Glu Asn Gly Val Tyr Thr Leu  
 450 455 460  
 Ser Thr Tyr Asp Phe Tyr Pro Ser Ile Pro Val Glu Tyr Gln Ala Thr  
 465 470 475 480  
 Arg Val Val Val Leu Ser Phe Glu Leu Leu Asn Ala Pro Ala Thr Val  
 485 490 495  
 Cys Gly Pro Lys Leu Ser Thr Gln Leu Val Lys Asn Gln Cys Val Asn  
 500 505 510  
 Phe Asn Phe Asn Gly Leu Arg Gly Thr Gly Val Leu Thr Thr Ser Ser  
 515 520 525  
 Lys Arg Phe Gln Ser Phe Gln Gln Phe Gly Arg Asp Thr Ser Asp Phe  
 530 535 540  
 Thr Asp Ser Val Arg Asp Pro Gln Thr Leu Glu Ile Leu Asp Ile Ser  
 545 550 555 560  
 Pro Cys Ser Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr Asn Ala  
 565 570 575  
 Ser Ser Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr Asp Val  
 580 585 590  
 Pro Thr Ser Ile His Ala Asp Gln Leu Thr Pro Ala Trp Arg Val Tyr  
 595 600 605  
 Ser Thr Gly Val Asn Val Phe Gln Thr Gln Ala Gly Cys Leu Ile Gly  
 610 615 620  
 Ala Glu His Val Asn Ala Ser Tyr Glu Cys Asp Ile Pro Ile Gly Ala  
 625 630 635 640  
 Gly Ile Cys Ala Ser Tyr His Thr Ala Ser Val Leu Arg Ser Thr Gly  
 645 650 655  
 Gln Lys Ser Ile Val Ala Tyr Thr Met Ser Leu Gly Ala Glu Asn Ser  
 660 665 670  
 Ile Ala Tyr Ala Asn Asn Ser Ile Ala Ile Pro Thr Asn Phe Ser Ile  
 675 680 685  
 Ser Val Thr Thr Glu Val Met Pro Val Ser Ile Ala Lys Thr Ser Val  
 690 695 700  
 Asp Cys Thr Met Tyr Ile Cys Gly Asp Ser Leu Glu Cys Ser Asn Leu  
 705 710 715 720  
 Leu Leu Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala Leu Thr  
 725 730 735  
 Gly Ile Ala Ile Glu Gln Asp Lys Asn Thr Gln Glu Val Phe Ala Gln  
 740 745 750  
 Val Lys Gln Met Tyr Lys Thr Pro Ala Ile Lys Asp Phe Gly Gly Phe  
 755 760 765  
 Asn Phe Ser Gln Ile Leu Pro Asp Pro Ser Lys Pro Thr Lys Arg Ser  
 770 775 780  
 Phe Ile Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp Ala Gly  
 785 790 795 800  
 Phe Met Lys Gln Tyr Gly Glu Cys Leu Gly Asp Ile Ser Ala Arg Asp

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805					810					815					
Leu	Ile	Cys	Ala	Gln	Lys	Phe	Asn	Gly	Leu	Thr	Val	Leu	Pro	Pro	Leu
			820					825					830		
Leu	Thr	Asp	Glu	Met	Ile	Ala	Ala	Tyr	Thr	Ala	Ala	Leu	Val	Ser	Gly
		835					840					845			
Thr	Ala	Thr	Ala	Gly	Trp	Thr	Phe	Gly	Ala	Gly	Ser	Ala	Leu	Gln	Ile
	850					855					860				
Pro	Phe	Ala	Met	Gln	Met	Ala	Tyr	Arg	Phe	Asn	Gly	Ile	Gly	Val	Thr
865				870						875					880
Gln	Asn	Val	Leu	Tyr	Glu	Asn	Gln	Lys	Gln	Ile	Ala	Asn	Gln	Phe	Asn
				885					890						895
Lys	Ala	Ile	Ser	Gln	Ile	Gln	Glu	Ser	Leu	Thr	Thr	Thr	Ser	Thr	Ala
			900						905						910
Leu	Gly	Lys	Leu	Gln	Asp	Val	Val	Asn	Asp	Asn	Ala	Gln	Ala	Leu	Asn
		915						920					925		
Thr	Leu	Val	Lys	Gln	Leu	Ser	Ser	Asn	Phe	Gly	Ala	Ile	Ser	Ser	Val
	930					935						940			
Leu	Asn	Asp	Ile	Leu	Ser	Arg	Leu	Asp	Lys	Val	Glu	Ala	Glu	Val	Gln
945					950					955					960
Ile	Asp	Arg	Leu	Ile	Thr	Gly	Arg	Leu	Gln	Ser	Leu	Gln	Thr	Tyr	Val
			965						970						975
Thr	Gln	Gln	Leu	Ile	Arg	Ala	Ala	Glu	Ile	Arg	Ala	Ser	Ala	Asn	Leu
			980					985							990
Ala	Ala	Thr	Lys	Met	Ser	Glu	Cys	Val	Leu	Gly	Gln	Ser	Lys	Arg	Val
			995					1000						1005	
Asp	Phe	Cys	Gly	Lys	Gly	Tyr	His	Leu	Met	Ser	Phe	Pro	Gln	Ala	
	1010					1015							1020		
Ala	Pro	His	Gly	Val	Val	Phe	Leu	His	Val	Thr	Tyr	Val	Pro	Ser	
	1025					1030							1035		
Gln	Glu	Arg	Asn	Phe	Thr	Thr	Ala	Pro	Ala	Ile	Cys	His	Glu	Gly	
	1040					1045						1050			
Lys	Ala	Tyr	Phe	Pro	Arg	Glu	Gly	Val	Phe	Val	Ser	Asn	Gly	Thr	
	1055					1060							1065		
Ser	Trp	Phe	Ile	Thr	Gln	Arg	Asn	Phe	Tyr	Ser	Pro	Gln	Ile	Ile	
	1070					1075							1080		
Thr	Thr	Asp	Asn	Thr	Phe	Val	Ala	Gly	Asn	Cys	Asp	Val	Val	Ile	
	1085					1090							1095		
Gly	Ile	Ile	Asn	Asn	Thr	Val	Tyr	Asp	Pro	Leu	Gln	Pro	Glu	Leu	
	1100					1105							1110		
Asp	Ser	Phe	Lys	Glu	Glu	Leu	Asp	Lys	Tyr	Phe	Lys	Asn	His	Thr	
	1115					1120							1125		
Ser	Pro	Asp	Val	Asp	Leu	Gly	Asp	Ile	Ser	Gly	Ile	Asn	Ala	Ser	
	1130					1135							1140		
Val	Val	Asn	Ile	Gln	Lys	Glu	Ile	Asp	Arg	Leu	Asn	Glu	Val	Ala	
	1145					1150							1155		
Lys	Asn	Leu	Asn	Glu	Ser	Leu	Ile	Asp	Leu	Gln	Glu	Leu	Gly	Lys	
	1160					1165							1170		
Tyr	Glu	Gln	Tyr	Ile	Lys	Trp	Pro	Trp	Tyr	Val	Trp	Leu	Gly	Phe	
	1175					1180							1185		
Ile	Ala	Gly	Leu	Ile	Ala	Ile	Val	Met	Val	Thr	Ile	Leu	Leu	Cys	
	1190					1195							1200		
Cys	Met	Thr	Ser	Cys	Cys	Ser	Cys	Leu	Lys	Gly	Ala	Cys	Ser	Cys	
	1205					1210							1215		

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Gly Ser Cys Cys Lys Phe Asp Glu Asp Asp Ser Glu Pro Val Leu  
 1220 1225 1230

Lys Gly Val Lys Leu His Tyr Thr  
 1235 1240

<210> SEQ ID NO 5  
 <211> LENGTH: 1355  
 <212> TYPE: PRT  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: chimeric coronavirus spike protein

<400> SEQUENCE: 5

Met Thr Leu Leu Met Cys Leu Leu Met Ser Leu Leu Ile Phe Val Arg  
 1 5 10 15

Gly Cys Asp Ser Gln Phe Val Asp Met Ser Pro Ala Ser Asn Thr Ser  
 20 25 30

Glu Cys Leu Glu Ser Gln Val Asp Ala Ala Ala Phe Ser Lys Leu Met  
 35 40 45

Trp Pro Tyr Pro Ile Asp Pro Ser Lys Val Asp Gly Ile Ile Tyr Pro  
 50 55 60

Leu Gly Arg Thr Tyr Ser Asn Ile Thr Leu Ala Tyr Thr Gly Leu Phe  
 65 70 75 80

Pro Leu Gln Gly Asp Leu Gly Ser Gln Tyr Leu Tyr Ser Val Ser His  
 85 90 95

Ala Val Gly His Asp Gly Asp Pro Thr Lys Ala Tyr Ile Ser Asn Tyr  
 100 105 110

Ser Leu Leu Val Asn Asp Phe Asp Asn Gly Phe Val Val Arg Ile Gly  
 115 120 125

Ala Ala Ala Asn Ser Thr Gly Thr Ile Val Ile Ser Pro Ser Val Asn  
 130 135 140

Thr Lys Ile Lys Lys Ala Tyr Pro Ala Phe Ile Leu Gly Ser Ser Leu  
 145 150 155 160

Thr Asn Thr Ser Ala Gly Gln Pro Leu Tyr Ala Asn Tyr Ser Leu Thr  
 165 170 175

Ile Ile Pro Asp Gly Cys Gly Thr Val Leu His Ala Phe Tyr Cys Ile  
 180 185 190

Leu Lys Pro Arg Thr Val Asn Arg Cys Pro Ser Gly Thr Gly Tyr Val  
 195 200 205

Ser Tyr Phe Ile Tyr Glu Thr Val His Asn Asp Cys Gln Ser Thr Ile  
 210 215 220

Asn Arg Asn Ala Ser Leu Asn Ser Phe Lys Ser Phe Phe Asp Leu Val  
 225 230 235 240

Asn Cys Thr Phe Phe Asn Ser Trp Asp Ile Thr Ala Asp Glu Thr Lys  
 245 250 255

Glu Trp Phe Gly Ile Thr Gln Asp Thr Gln Gly Val His Leu Tyr Ser  
 260 265 270

Ser Arg Lys Gly Asp Leu Tyr Gly Gly Asn Met Phe Arg Phe Ala Thr  
 275 280 285

Leu Pro Val Tyr Glu Gly Ile Lys Tyr Tyr Thr Val Ile Pro Arg Ser  
 290 295 300

Phe Arg Ser Lys Ala Asn Lys Arg Glu Ala Trp Ala Ala Phe Tyr Val  
 305 310 315 320

Tyr Lys Leu His Gln Leu Thr Tyr Leu Leu Asp Phe Ser Val Asp Gly  
 325 330 335

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Tyr Ile Arg Arg Ala Ile Asp Cys Gly His Asp Asp Leu Ser Gln Leu  
 340 345 350  
 His Cys Ser Tyr Thr Ser Phe Glu Val Asp Thr Gly Val Tyr Ser Val  
 355 360 365  
 Ser Ser Tyr Glu Ala Lys Pro Ser Gly Ser Val Val Glu Gln Ala Glu  
 370 375 380  
 Gly Val Glu Cys Asp Phe Ser Pro Leu Leu Ser Gly Thr Pro Pro Gln  
 385 390 395 400  
 Val Tyr Asn Phe Lys Arg Leu Val Phe Thr Asn Cys Asn Tyr Asn Leu  
 405 410 415  
 Thr Lys Leu Leu Ser Leu Phe Ser Val Asn Asp Phe Thr Cys Ser Gln  
 420 425 430  
 Ile Ser Pro Ala Ala Ile Ala Ser Asn Cys Tyr Ser Ser Leu Ile Leu  
 435 440 445  
 Asp Tyr Phe Ser Tyr Pro Leu Ser Met Lys Ser Asp Leu Ser Val Ser  
 450 455 460  
 Ser Ala Gly Pro Ile Ser Gln Phe Asn Tyr Lys Gln Ser Phe Ser Asn  
 465 470 475 480  
 Pro Thr Cys Leu Ile Leu Ala Thr Val Pro His Asn Leu Thr Thr Ile  
 485 490 495  
 Thr Lys Pro Leu Lys Tyr Ser Tyr Ile Asn Lys Cys Ser Arg Leu Leu  
 500 505 510  
 Ser Asp Asp Arg Thr Glu Val Pro Gln Leu Val Asn Ala Asn Gln Tyr  
 515 520 525  
 Ser Pro Cys Val Ser Ile Val Pro Ser Thr Val Trp Glu Asp Gly Asp  
 530 535 540  
 Tyr Tyr Arg Lys Gln Leu Ser Pro Leu Glu Gly Gly Gly Trp Leu Val  
 545 550 555 560  
 Ala Ser Gly Ser Thr Val Ala Met Thr Glu Gln Leu Gln Met Gly Phe  
 565 570 575  
 Gly Ile Thr Val Gln Tyr Gly Thr Asp Thr Asn Ser Val Cys Pro Lys  
 580 585 590  
 Leu Asp Leu Gly Asp Ser Leu Thr Ile Thr Asn Arg Leu Gly Lys Cys  
 595 600 605  
 Val Asp Tyr Ser Leu Tyr Gly Val Thr Gly Arg Gly Val Phe Gln Asn  
 610 615 620  
 Cys Thr Ala Val Gly Val Lys Gln Gln Arg Phe Val Tyr Asp Ser Phe  
 625 630 635 640  
 Asp Asn Leu Val Gly Tyr Tyr Ser Asp Asp Gly Asn Tyr Tyr Cys Val  
 645 650 655  
 Arg Pro Cys Val Ser Val Pro Val Ser Val Ile Tyr Asp Lys Ser Thr  
 660 665 670  
 Asn Leu His Ala Thr Leu Phe Gly Ser Val Ala Cys Glu His Val Thr  
 675 680 685  
 Thr Met Met Ser Gln Phe Ser Arg Leu Thr Gln Ser Asn Leu Arg Arg  
 690 695 700  
 Arg Asp Ser Asn Ile Pro Leu Gln Thr Ala Val Gly Cys Val Ile Gly  
 705 710 715 720  
 Leu Ser Asn Asn Ser Leu Val Val Ser Asp Cys Lys Leu Pro Leu Gly  
 725 730 735  
 Gln Ser Leu Cys Ala Val Pro Pro Val Ser Thr Phe Arg Ser Tyr Ser  
 740 745 750

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Ala	Ser	Gln	Phe	Gln	Leu	Ala	Val	Leu	Asn	Tyr	Thr	Ser	Pro	Ile	Val
		755					760					765			
Val	Thr	Pro	Ile	Asn	Ser	Ser	Gly	Phe	Thr	Ala	Ala	Ile	Pro	Thr	Asn
	770					775					780				
Phe	Ser	Phe	Ser	Val	Thr	Gln	Glu	Tyr	Ile	Glu	Thr	Ser	Ile	Gln	Lys
785				790						795					800
Val	Thr	Val	Asp	Cys	Lys	Gln	Tyr	Val	Cys	Asn	Gly	Phe	Thr	Arg	Cys
				805					810					815	
Glu	Lys	Leu	Leu	Val	Glu	Tyr	Gly	Gln	Phe	Cys	Ser	Lys	Ile	Asn	Gln
			820					825					830		
Ala	Leu	His	Gly	Ala	Asn	Leu	Arg	Gln	Asp	Glu	Ser	Val	Tyr	Ser	Leu
		835					840					845			
Tyr	Ser	Asn	Ile	Lys	Thr	Thr	Ser	Thr	Gln	Thr	Leu	Glu	Tyr	Gly	Leu
	850					855					860				
Asn	Gly	Asp	Phe	Asn	Leu	Thr	Leu	Leu	Gln	Val	Pro	Gln	Ile	Gly	Gly
865					870					875					880
Ser	Ser	Ser	Ser	Tyr	Arg	Ser	Ala	Ile	Glu	Asp	Leu	Leu	Phe	Asp	Lys
				885					890					895	
Val	Thr	Ile	Ala	Asp	Pro	Gly	Tyr	Met	Gln	Gly	Tyr	Asp	Asp	Cys	Met
			900					905					910		
Lys	Gln	Gly	Pro	Gln	Ser	Ala	Arg	Asp	Leu	Ile	Cys	Ala	Gln	Tyr	Val
		915					920					925			
Ser	Gly	Tyr	Lys	Val	Leu	Pro	Pro	Leu	Tyr	Asp	Pro	Asn	Met	Glu	Ala
	930					935					940				
Ala	Tyr	Thr	Ser	Ser	Leu	Leu	Gly	Ser	Ile	Ala	Gly	Ala	Gly	Trp	Thr
945					950					955					960
Ala	Gly	Leu	Ser	Ser	Phe	Ala	Ala	Ile	Pro	Phe	Ala	Gln	Ser	Met	Phe
				965					970					975	
Tyr	Arg	Leu	Asn	Gly	Val	Gly	Ile	Thr	Gln	Gln	Val	Leu	Ser	Glu	Asn
			980					985					990		
Gln	Lys	Ile	Ile	Ala	Asn	Lys	Phe	Asn	Gln	Ala	Leu	Gly	Ala	Met	Gln
		995					1000					1005			
Thr	Gly	Phe	Thr	Thr	Thr	Asn	Leu	Ala	Phe	Asn	Lys	Val	Gln	Asp	
	1010					1015						1020			
Ala	Val	Asn	Ala	Asn	Ala	Met	Ala	Leu	Ser	Lys	Leu	Ala	Ala	Glu	
	1025					1030						1035			
Leu	Ser	Asn	Thr	Phe	Gly	Ala	Ile	Ser	Ser	Ser	Ile	Ser	Asp	Ile	
	1040					1045						1050			
Leu	Ala	Arg	Leu	Asp	Thr	Val	Glu	Gln	Glu	Ala	Gln	Ile	Asp	Arg	
	1055					1060						1065			
Leu	Ile	Asn	Gly	Arg	Leu	Thr	Ser	Leu	Asn	Ala	Phe	Val	Ala	Gln	
	1070					1075						1080			
Gln	Leu	Val	Arg	Thr	Glu	Ala	Ala	Ala	Arg	Ser	Ala	Gln	Leu	Ala	
	1085					1090						1095			
Gln	Asp	Lys	Val	Asn	Glu	Cys	Val	Lys	Ser	Gln	Ser	Lys	Arg	Asn	
	1100					1105						1110			
Gly	Phe	Cys	Gly	Thr	Gly	Thr	His	Ile	Val	Ser	Phe	Ala	Ile	Asn	
	1115					1120						1125			
Ala	Pro	Asn	Gly	Leu	Tyr	Phe	Phe	His	Val	Gly	Tyr	Gln	Pro	Thr	
	1130					1135						1140			
Ser	His	Val	Asn	Ala	Thr	Ala	Ala	Tyr	Gly	Leu	Cys	Asn	Thr	Glu	
	1145					1150						1155			
Asn	Pro	Pro	Lys	Cys	Ile	Ala	Pro	Ile	Asp	Gly	Tyr	Phe	Val	Leu	

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1160	1165	1170
Asn Gln Thr Thr Ser Thr Ala Arg Ser Ser Gly Asp Gln His Trp		
1175	1180	1185
Tyr Tyr Thr Gly Ser Ser Phe Phe His Pro Glu Pro Ile Thr Glu		
1190	1195	1200
Ala Asn Ser Lys Tyr Val Ser Met Asp Val Lys Phe Glu Asn Leu		
1205	1210	1215
Thr Asn Lys Leu Pro Pro Pro Leu Leu Ser Asn Ser Thr Asp Leu		
1220	1225	1230
Asp Phe Lys Asp Glu Leu Glu Glu Phe Phe Lys Asn Val Ser Ser		
1235	1240	1245
Gln Gly Pro Asn Phe Gln Glu Ile Ser Lys Ile Asn Thr Thr Leu		
1250	1255	1260
Leu Asn Leu Asn Thr Glu Leu Met Val Leu Ser Glu Val Val Lys		
1265	1270	1275
Gln Leu Asn Glu Ser Tyr Ile Asp Leu Lys Glu Leu Gly Asn Tyr		
1280	1285	1290
Thr Phe Tyr Gln Lys Trp Pro Trp Tyr Ile Trp Leu Gly Phe Ile		
1295	1300	1305
Ala Gly Leu Val Ala Leu Ala Leu Cys Val Phe Phe Ile Leu Cys		
1310	1315	1320
Cys Thr Gly Cys Gly Thr Ser Cys Leu Gly Lys Leu Lys Cys Asn		
1325	1330	1335
Arg Cys Cys Asp Ser Tyr Asp Glu Tyr Glu Val Glu Lys Ile His		
1340	1345	1350
Val His		
1355		

&lt;210&gt; SEQ ID NO 6

&lt;211&gt; LENGTH: 1352

&lt;212&gt; TYPE: PRT

&lt;213&gt; ORGANISM: Artificial

&lt;220&gt; FEATURE:

&lt;223&gt; OTHER INFORMATION: Bat coronavirus

&lt;400&gt; SEQUENCE: 6

Met Thr Leu Leu Met Cys Leu Leu Met Ser Leu Leu Ile Phe Val Arg		
1	5	10 15
Gly Cys Asp Ser Gln Phe Val Asp Met Ser Pro Ala Ser Asn Thr Ser		
	20	25 30
Glu Cys Leu Glu Ser Gln Val Asp Ala Ala Ala Phe Ser Lys Leu Met		
	35	40 45
Trp Pro Tyr Pro Ile Asp Pro Ser Lys Val Asp Gly Ile Ile Tyr Pro		
	50	55 60
Leu Gly Arg Thr Tyr Ser Asn Ile Thr Leu Ala Tyr Thr Gly Leu Phe		
65	70	75 80
Pro Leu Gln Gly Asp Leu Gly Ser Gln Tyr Leu Tyr Ser Val Ser His		
	85	90 95
Ala Val Gly His Asp Gly Asp Pro Thr Lys Ala Tyr Ile Ser Asn Tyr		
	100	105 110
Ser Leu Leu Val Asn Asp Phe Asp Asn Gly Phe Val Val Arg Ile Gly		
	115	120 125
Ala Ala Ala Asn Ser Thr Gly Thr Ile Val Ile Ser Pro Ser Val Asn		
130	135	140
Thr Lys Ile Lys Lys Ala Tyr Pro Ala Phe Ile Leu Gly Ser Ser Leu		

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145	150	155	160
Thr Asn Thr Ser Ala Gly Gln Pro Leu Tyr Ala Asn Tyr Ser Leu Thr	165	170	175
Ile Ile Pro Asp Gly Cys Gly Thr Val Leu His Ala Phe Tyr Cys Ile	180	185	190
Leu Lys Pro Arg Thr Val Asn Arg Cys Pro Ser Gly Thr Gly Tyr Val	195	200	205
Ser Tyr Phe Ile Tyr Glu Thr Val His Asn Asp Cys Gln Ser Thr Ile	210	215	220
Asn Arg Asn Ala Ser Leu Asn Ser Phe Lys Ser Phe Phe Asp Leu Val	225	230	235
Asn Cys Thr Phe Phe Asn Ser Trp Asp Ile Thr Ala Asp Glu Thr Lys	245	250	255
Glu Trp Phe Gly Ile Thr Gln Asp Thr Gln Gly Val His Leu Tyr Ser	260	265	270
Ser Arg Lys Gly Asp Leu Tyr Gly Gly Asn Met Phe Arg Phe Ala Thr	275	280	285
Leu Pro Val Tyr Glu Gly Ile Lys Tyr Tyr Thr Val Ile Pro Arg Ser	290	295	300
Phe Arg Ser Lys Ala Asn Lys Arg Glu Ala Trp Ala Ala Phe Tyr Val	305	310	315
Tyr Lys Leu His Gln Leu Thr Tyr Leu Leu Asp Phe Ser Val Asp Gly	325	330	335
Tyr Ile Arg Arg Ala Ile Asp Cys Gly His Asp Asp Leu Ser Gln Leu	340	345	350
His Cys Ser Tyr Thr Ser Phe Glu Val Asp Thr Gly Val Tyr Ser Val	355	360	365
Ser Ser Tyr Glu Ala Ser Ala Thr Gly Thr Phe Ile Glu Gln Pro Asn	370	375	380
Ala Thr Glu Cys Asp Phe Ser Pro Met Leu Thr Gly Val Ala Pro Gln	385	390	395
Val Tyr Asn Phe Lys Arg Leu Val Phe Ser Asn Cys Asn Tyr Asn Leu	405	410	415
Thr Lys Leu Leu Ser Leu Phe Ala Val Asp Glu Phe Ser Cys Asn Gly	420	425	430
Ile Ser Pro Asp Ala Ile Ala Arg Gly Cys Tyr Ser Thr Leu Thr Val	435	440	445
Asp Tyr Phe Ala Tyr Pro Leu Ser Met Lys Ser Tyr Ile Arg Pro Gly	450	455	460
Ser Ala Gly Asn Ile Pro Leu Tyr Asn Tyr Lys Gln Ser Phe Ala Asn	465	470	475
Pro Thr Cys Arg Val Met Ala Ser Val Leu Ala Asn Val Thr Ile Thr	485	490	495
Lys Pro His Ala Tyr Gly Tyr Ile Ser Lys Cys Ser Arg Leu Thr Gly	500	505	510
Ala Asn Gln Asp Val Glu Thr Pro Leu Tyr Ile Asn Pro Gly Glu Tyr	515	520	525
Ser Ile Cys Arg Asp Phe Ser Pro Gly Gly Phe Ser Glu Asp Gly Gln	530	535	540
Val Phe Lys Arg Thr Leu Thr Gln Phe Glu Gly Gly Gly Leu Leu Ile	545	550	555
Gly Val Gly Thr Arg Val Pro Met Thr Asp Asn Leu Gln Met Ser Phe	565	570	575



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Ile Ile Ser Val Gln Tyr Gly Thr Gly Thr Asp Ser Val Cys Pro Met  
                   580  585  590

Leu Asp Leu Gly Asp Ser Leu Thr Ile Thr Asn Arg Leu Gly Lys Cys  
                   595  600  605

Val Asp Tyr Ser Leu Tyr Gly Val Thr Gly Arg Gly Val Phe Gln Asn  
                   610  615  620

Cys Thr Ala Val Gly Val Lys Gln Gln Arg Phe Val Tyr Asp Ser Phe  
                   625  630  635  640

Asp Asn Leu Val Gly Tyr Tyr Ser Asp Asp Gly Asn Tyr Tyr Cys Val  
                                   645  650  655

Arg Pro Cys Val Ser Val Pro Val Ser Val Ile Tyr Asp Lys Ser Thr  
                   660  665  670

Asn Leu His Ala Thr Leu Phe Gly Ser Val Ala Cys Glu His Val Thr  
                   675  680  685

Thr Met Met Ser Gln Phe Ser Arg Leu Thr Gln Ser Asn Leu Arg Arg  
                   690  695  700

Arg Asp Ser Asn Ile Pro Leu Gln Thr Ala Val Gly Cys Val Ile Gly  
                   705  710  715  720

Leu Ser Asn Asn Ser Leu Val Val Ser Asp Cys Lys Leu Pro Leu Gly  
                                   725  730  735

Gln Ser Leu Cys Ala Val Pro Pro Val Ser Thr Phe Arg Ser Tyr Ser  
                                   740  745  750

Ala Ser Gln Phe Gln Leu Ala Val Leu Asn Tyr Thr Ser Pro Ile Val  
                   755  760  765

Val Thr Pro Ile Asn Ser Ser Gly Phe Thr Ala Ala Ile Pro Thr Asn  
                   770  775  780

Phe Ser Phe Ser Val Thr Gln Glu Tyr Ile Glu Thr Ser Ile Gln Lys  
                   785  790  795  800

Val Thr Val Asp Cys Lys Gln Tyr Val Cys Asn Gly Phe Thr Arg Cys  
                                   805  810  815

Glu Lys Leu Leu Val Glu Tyr Gly Gln Phe Cys Ser Lys Ile Asn Gln  
                                   820  825  830

Ala Leu His Gly Ala Asn Leu Arg Gln Asp Glu Ser Val Tyr Ser Leu  
                   835  840  845

Tyr Ser Asn Ile Lys Thr Thr Ser Thr Gln Thr Leu Glu Tyr Gly Leu  
                   850  855  860

Asn Gly Asp Phe Asn Leu Thr Leu Leu Gln Val Pro Gln Ile Gly Gly  
                   865  870  875  880

Ser Ser Ser Ser Tyr Arg Ser Ala Ile Glu Asp Leu Leu Phe Asp Lys  
                                   885  890  895

Val Thr Ile Ala Asp Pro Gly Tyr Met Gln Gly Tyr Asp Asp Cys Met  
                                   900  905  910

Lys Gln Gly Pro Gln Ser Ala Arg Asp Leu Ile Cys Ala Gln Tyr Val  
                   915  920  925

Ser Gly Tyr Lys Val Leu Pro Pro Leu Tyr Asp Pro Asn Met Glu Ala  
                   930  935  940

Ala Tyr Thr Ser Ser Leu Leu Gly Ser Ile Ala Gly Ala Gly Trp Thr  
                   945  950  955  960

Ala Gly Leu Ser Ser Phe Ala Ala Ile Pro Phe Ala Gln Ser Met Phe  
                                   965  970  975

Tyr Arg Leu Asn Gly Val Gly Ile Thr Gln Gln Val Leu Ser Glu Asn  
                   980  985  990

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Gln	Lys	Leu	Ile	Ala	Asn	Lys	Phe	Asn	Gln	Ala	Leu	Gly	Ala	Met	Gln
		995					1000					1005			
Thr	Gly	Phe	Thr	Thr	Ser	Asn	Leu	Ala	Phe	Ser	Lys	Val	Gln	Asp	
	1010					1015					1020				
Ala	Val	Asn	Ala	Asn	Ala	Gln	Ala	Leu	Ser	Lys	Leu	Ala	Ser	Glu	
	1025					1030					1035				
Leu	Ser	Asn	Thr	Phe	Gly	Ala	Ile	Ser	Ser	Ser	Ile	Ser	Asp	Ile	
	1040					1045					1050				
Leu	Ala	Arg	Leu	Asp	Thr	Val	Glu	Gln	Asp	Ala	Gln	Ile	Asp	Arg	
	1055					1060					1065				
Leu	Ile	Asn	Gly	Arg	Leu	Thr	Ser	Leu	Asn	Ala	Phe	Val	Ser	Gln	
	1070					1075					1080				
Gln	Leu	Val	Arg	Ser	Glu	Thr	Ala	Ala	Arg	Ser	Ala	Gln	Leu	Ala	
	1085					1090					1095				
Ser	Asp	Lys	Val	Asn	Glu	Cys	Val	Lys	Ser	Gln	Ser	Lys	Arg	Asn	
	1100					1105					1110				
Gly	Phe	Cys	Gly	Ser	Gly	Thr	His	Ile	Val	Ser	Phe	Val	Val	Asn	
	1115					1120					1125				
Ala	Pro	Asn	Gly	Phe	Tyr	Phe	Phe	His	Val	Gly	Tyr	Val	Pro	Thr	
	1130					1135					1140				
Asn	Tyr	Thr	Asn	Val	Thr	Ala	Ala	Tyr	Gly	Leu	Cys	Asn	Asn	Asn	
	1145					1150					1155				
Asn	Pro	Pro	Leu	Cys	Ile	Ala	Pro	Ile	Asp	Gly	Tyr	Phe	Ile	Thr	
	1160					1165					1170				
Asn	Gln	Thr	Thr	Thr	Tyr	Ser	Val	Asp	Thr	Glu	Trp	Tyr	Tyr	Thr	
	1175					1180					1185				
Gly	Ser	Ser	Phe	Tyr	Lys	Pro	Glu	Pro	Ile	Thr	Gln	Ala	Asn	Ser	
	1190					1195					1200				
Arg	Tyr	Val	Ser	Ser	Asp	Val	Lys	Phe	Asp	Lys	Leu	Glu	Asn	Asn	
	1205					1210					1215				
Leu	Pro	Pro	Pro	Leu	Leu	Glu	Asn	Ser	Thr	Asp	Val	Asp	Phe	Lys	
	1220					1225					1230				
Asp	Glu	Leu	Glu	Glu	Phe	Phe	Lys	Asn	Val	Thr	Ser	His	Gly	Pro	
	1235					1240					1245				
Asn	Phe	Ala	Glu	Ile	Ser	Lys	Ile	Asn	Thr	Thr	Leu	Leu	Asp	Leu	
	1250					1255					1260				
Ser	Asp	Glu	Met	Ala	Met	Leu	Gln	Glu	Val	Val	Lys	Gln	Leu	Asn	
	1265					1270					1275				
Asp	Ser	Tyr	Ile	Asp	Leu	Lys	Glu	Leu	Gly	Asn	Tyr	Thr	Tyr	Tyr	
	1280					1285					1290				
Asn	Lys	Trp	Pro	Trp	Tyr	Val	Trp	Leu	Gly	Phe	Ile	Ala	Gly	Leu	
	1295					1300					1305				
Val	Ala	Leu	Leu	Leu	Cys	Val	Phe	Phe	Leu	Leu	Cys	Cys	Thr	Gly	
	1310					1315					1320				
Cys	Gly	Thr	Ser	Cys	Leu	Gly	Lys	Met	Lys	Cys	Lys	Asn	Cys	Cys	
	1325					1330					1335				
Asp	Ser	Tyr	Glu	Glu	Tyr	Asp	Val	Glu	Lys	Ile	His	Val	His		
	1340					1345					1350				

&lt;210&gt; SEQ ID NO 7

&lt;211&gt; LENGTH: 1353

&lt;212&gt; TYPE: PRT

&lt;213&gt; ORGANISM: Artificial

&lt;220&gt; FEATURE:

&lt;223&gt; OTHER INFORMATION: MERS coronavirus

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&lt;400&gt; SEQUENCE: 7

Met Ile His Ser Val Phe Leu Leu Met Phe Leu Leu Thr Pro Thr Glu  
 1 5 10 15  
 Ser Tyr Val Asp Val Gly Pro Asp Ser Val Lys Ser Ala Cys Ile Glu  
 20 25 30  
 Val Asp Ile Gln Gln Thr Phe Phe Asp Lys Thr Trp Pro Arg Pro Ile  
 35 40 45  
 Asp Val Ser Lys Ala Asp Gly Ile Ile Tyr Pro Gln Gly Arg Thr Tyr  
 50 55 60  
 Ser Asn Ile Thr Ile Thr Tyr Gln Gly Leu Phe Pro Tyr Gln Gly Asp  
 65 70 75 80  
 His Gly Asp Met Tyr Val Tyr Ser Ala Gly His Ala Thr Gly Thr Thr  
 85 90 95  
 Pro Gln Lys Leu Phe Val Ala Asn Tyr Ser Gln Asp Val Lys Gln Phe  
 100 105 110  
 Ala Asn Gly Phe Val Val Arg Ile Gly Ala Ala Ala Asn Ser Thr Gly  
 115 120 125  
 Thr Val Ile Ile Ser Pro Ser Thr Ser Ala Thr Ile Arg Lys Ile Tyr  
 130 135 140  
 Pro Ala Phe Met Leu Gly Ser Ser Val Gly Asn Phe Ser Asp Gly Lys  
 145 150 155 160  
 Met Gly Arg Phe Phe Asn His Thr Leu Val Leu Leu Pro Asp Gly Cys  
 165 170 175  
 Gly Thr Leu Leu Arg Ala Phe Tyr Cys Ile Leu Glu Pro Arg Ser Gly  
 180 185 190  
 Asn His Cys Pro Ala Gly Asn Ser Tyr Thr Ser Phe Ala Thr Tyr His  
 195 200 205  
 Thr Pro Ala Thr Asp Cys Ser Asp Gly Asn Tyr Asn Arg Asn Ala Ser  
 210 215 220  
 Leu Asn Ser Phe Lys Glu Tyr Phe Asn Leu Arg Asn Cys Thr Phe Met  
 225 230 235 240  
 Tyr Thr Tyr Asn Ile Thr Glu Asp Glu Ile Leu Glu Trp Phe Gly Ile  
 245 250 255  
 Thr Gln Thr Ala Gln Gly Val His Leu Phe Ser Ser Arg Tyr Val Asp  
 260 265 270  
 Leu Tyr Gly Gly Asn Met Phe Gln Phe Ala Thr Leu Pro Val Tyr Asp  
 275 280 285  
 Thr Ile Lys Tyr Tyr Ser Ile Ile Pro His Ser Ile Arg Ser Ile Gln  
 290 295 300  
 Ser Asp Arg Lys Ala Trp Ala Ala Phe Tyr Val Tyr Lys Leu Gln Pro  
 305 310 315 320  
 Leu Thr Phe Leu Leu Asp Phe Ser Val Asp Gly Tyr Ile Arg Arg Ala  
 325 330 335  
 Ile Asp Cys Gly Phe Asn Asp Leu Ser Gln Leu His Cys Ser Tyr Glu  
 340 345 350  
 Ser Phe Asp Val Glu Ser Gly Val Tyr Ser Val Ser Ser Phe Glu Ala  
 355 360 365  
 Lys Pro Ser Gly Ser Val Val Glu Gln Ala Glu Gly Val Glu Cys Asp  
 370 375 380  
 Phe Ser Pro Leu Leu Ser Gly Thr Pro Pro Gln Val Tyr Asn Phe Lys  
 385 390 395 400  
 Arg Leu Val Phe Thr Asn Cys Asn Tyr Asn Leu Thr Lys Leu Leu Ser

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405				410				415							
Leu	Phe	Ser	Val	Asn	Asp	Phe	Thr	Cys	Ser	Gln	Ile	Ser	Pro	Ala	Ala
			420							425				430	
Ile	Ala	Ser	Asn	Cys	Tyr	Ser	Ser	Leu	Ile	Leu	Asp	Tyr	Phe	Ser	Tyr
			435							440				445	
Pro	Leu	Ser	Met	Lys	Ser	Asp	Leu	Ser	Val	Ser	Ser	Ala	Gly	Pro	Ile
			450											460	
Ser	Gln	Phe	Asn	Tyr	Lys	Gln	Ser	Phe	Ser	Asn	Pro	Thr	Cys	Leu	Ile
			465											480	
Leu	Ala	Thr	Val	Pro	His	Asn	Leu	Thr	Thr	Ile	Thr	Lys	Pro	Leu	Lys
														495	
Tyr	Ser	Tyr	Ile	Asn	Lys	Cys	Ser	Arg	Leu	Leu	Ser	Asp	Asp	Arg	Thr
			500											510	
Glu	Val	Pro	Gln	Leu	Val	Asn	Ala	Asn	Gln	Tyr	Ser	Pro	Cys	Val	Ser
			515											525	
Ile	Val	Pro	Ser	Thr	Val	Trp	Glu	Asp	Gly	Asp	Tyr	Tyr	Arg	Lys	Gln
			530											540	
Leu	Ser	Pro	Leu	Glu	Gly	Gly	Gly	Trp	Leu	Val	Ala	Ser	Gly	Ser	Thr
			545											560	
Val	Ala	Met	Thr	Glu	Gln	Leu	Gln	Met	Gly	Phe	Gly	Ile	Thr	Val	Gln
														575	
Tyr	Gly	Thr	Asp	Thr	Asn	Ser	Val	Cys	Pro	Lys	Leu	Glu	Phe	Ala	Asn
			580											590	
Asp	Thr	Lys	Ile	Ala	Ser	Gln	Leu	Gly	Asn	Cys	Val	Glu	Tyr	Ser	Leu
			595											605	
Tyr	Gly	Val	Ser	Gly	Arg	Gly	Val	Phe	Gln	Asn	Cys	Thr	Ala	Val	Gly
			610											620	
Val	Arg	Gln	Gln	Arg	Phe	Val	Tyr	Asp	Ala	Tyr	Gln	Asn	Leu	Val	Gly
			625											640	
Tyr	Tyr	Ser	Asp	Asp	Gly	Asn	Tyr	Tyr	Cys	Leu	Arg	Ala	Cys	Val	Ser
			645											655	
Val	Pro	Val	Ser	Val	Ile	Tyr	Asp	Lys	Glu	Thr	Lys	Thr	His	Ala	Thr
			660											670	
Leu	Phe	Gly	Ser	Val	Ala	Cys	Glu	His	Ile	Ser	Ser	Thr	Met	Ser	Gln
			675											685	
Tyr	Ser	Arg	Ser	Thr	Arg	Ser	Met	Leu	Lys	Arg	Arg	Asp	Ser	Thr	Tyr
			690											700	
Gly	Pro	Leu	Gln	Thr	Pro	Val	Gly	Cys	Val	Leu	Gly	Leu	Val	Asn	Ser
			705											720	
Ser	Leu	Phe	Val	Glu	Asp	Cys	Lys	Leu	Pro	Leu	Gly	Gln	Ser	Leu	Cys
			725											735	
Ala	Leu	Pro	Asp	Thr	Pro	Ser	Thr	Leu	Thr	Pro	Arg	Ser	Val	Arg	Ser
			740											750	
Val	Pro	Gly	Glu	Met	Arg	Leu	Ala	Ser	Ile	Ala	Phe	Asn	His	Pro	Ile
			755											765	
Gln	Val	Asp	Gln	Leu	Asn	Ser	Ser	Tyr	Phe	Lys	Leu	Ser	Ile	Pro	Thr
			770											780	
Asn	Phe	Ser	Phe	Gly	Val	Thr	Gln	Glu	Tyr	Ile	Gln	Thr	Thr	Ile	Gln
			785											800	
Lys	Val	Thr	Val	Asp	Cys	Lys	Gln	Tyr	Val	Cys	Asn	Gly	Phe	Gln	Lys
			805											815	
Cys	Glu	Gln	Leu	Leu	Arg	Glu	Tyr	Gly	Gln	Phe	Cys	Ser	Lys	Ile	Asn
			820											830	