

LISTADO DE SECUENCIAS

<110> Boehringer Ingelheim Vetmedica GmbH
 <120> SUBUNIDAD S1 MODIFICADA DE LA PROTEÍNA DE ESPÍCULA DE CORONAVIRUS
 <130> 01-3363 PCT y US
 <160> 84
 <170> PatentIn versión 3.5
 <210> 1
 <211> 1162
 <212> PRT
 <213> Virus de bronquitis infecciosa aviar
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Met Leu Val Thr Pro Leu Leu Leu Val Thr Leu Leu Cys Ala Leu Cys
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Ser Ala Ala Leu Tyr Asp Ser Ser Ser Tyr Val Tyr Tyr Tyr Gln Ser
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Ala Phe Arg Pro Pro Asp Gly Trp His Leu His Gly Gly Ala Tyr Ala
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Val Val Asn Ile Ser Ser Glu Ser Asn Asn Ala Gly Ser Ser Ser Gly
 50 55 60

Cys Thr Val Gly Ile Ile His Gly Gly Arg Val Val Asn Ala Ser Ser
 65 70 75 80

Ile Ala Met Thr Ala Pro Ser Ser Gly Met Ala Trp Ser Ser Ser Gln
 85 90 95

Phe Cys Thr Ala Tyr Cys Asn Phe Ser Asp Thr Thr Val Phe Val Thr
 100 105 110

His Cys Tyr Lys His Gly Gly Cys Pro Ile Thr Gly Met Leu Gln Gln
 115 120 125

His Ser Ile Arg Val Ser Ala Met Lys Asn Gly Gln Leu Phe Tyr Asn
 130 135 140

Leu Thr Val Ser Val Ala Lys Tyr Pro Thr Phe Lys Ser Phe Gln Cys
145 150 155 160

Val Asn Asn Leu Thr Ser Val Tyr Leu Asn Gly Asp Leu Val Tyr Thr
165 170 175

Ser Asn Glu Thr Thr Asp Val Thr Ser Ala Gly Val Tyr Phe Lys Ala
180 185 190

Gly Gly Pro Ile Thr Tyr Lys Val Met Arg Glu Val Arg Ala Leu Ala
195 200 205

Tyr Phe Val Asn Gly Thr Ala Gln Asp Val Ile Leu Cys Asp Gly Ser
210 215 220

Pro Arg Gly Leu Leu Ala Cys Gln Tyr Asn Thr Gly Asn Phe Ser Asp
225 230 235 240

Gly Phe Tyr Pro Phe Thr Asn Ser Ser Leu Val Lys Gln Lys Phe Ile
245 250 255

Val Tyr Arg Glu Asn Ser Val Asn Thr Thr Phe Thr Leu His Asn Phe
260 265 270

Thr Phe His Asn Glu Thr Gly Ala Asn Pro Asn Pro Ser Gly Val Gln
275 280 285

Asn Ile Gln Thr Tyr Gln Thr Gln Thr Ala Gln Ser Gly Tyr Tyr Asn
290 295 300

Phe Asn Phe Ser Phe Leu Ser Ser Phe Val Tyr Lys Glu Ser Asn Phe
305 310 315 320

Met Tyr Gly Ser Tyr His Pro Ser Cys Asn Phe Arg Leu Glu Thr Ile
325 330 335

Asn Asn Gly Leu Trp Phe Asn Ser Leu Ser Val Ser Ile Ala Tyr Gly
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Pro Leu Gln Gly Gly Cys Lys Gln Ser Val Phe Ser Gly Arg Ala Thr

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	370					375					380					
Tyr	Ser	Gly	Glu	Leu	Asp	His	Asn	Phe	Glu	Cys	Gly	Leu	Leu	Val	Tyr	
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Val	Thr	Lys	Ser	Gly	Gly	Ser	Arg	Ile	Gln	Thr	Ala	Thr	Glu	Pro	Pro	
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Val	Ile	Thr	Gln	His	Asn	Tyr	Asn	Asn	Ile	Thr	Leu	Asn	Thr	Cys	Val	
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Asp	Tyr	Asn	Ile	Tyr	Gly	Arg	Thr	Gly	Gln	Gly	Phe	Ile	Thr	Asn	Val	
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Thr	Asp	Ser	Ala	Val	Ser	Tyr	Asn	Tyr	Leu	Ala	Asp	Ala	Gly	Leu	Ala	
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Ile	Leu	Asp	Thr	Ser	Gly	Ser	Ile	Asp	Ile	Phe	Val	Val	Gln	Ser	Glu	
465					470					475					480	
Tyr	Gly	Leu	Asn	Tyr	Tyr	Lys	Val	Asn	Pro	Cys	Glu	Asp	Val	Asn	Gln	
				485					490					495		
Gln	Phe	Val	Val	Ser	Gly	Gly	Lys	Leu	Val	Gly	Ile	Leu	Thr	Ser	Arg	
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Asn	Glu	Thr	Gly	Ser	Gln	Leu	Leu	Glu	Asn	Gln	Phe	Tyr	Ile	Lys	Ile	
		515					520					525				
Thr	Asn	Gly	Thr	Arg	Arg	Phe	Arg	Arg	Ser	Ile	Thr	Glu	Ser	Val	Glu	
	530					535					540					
Asn	Cys	Pro	Tyr	Val	Ser	Tyr	Gly	Lys	Phe	Cys	Ile	Lys	Pro	Asp	Gly	
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Ser	Ile	Ala	Thr	Ile	Val	Pro	Lys	Gln	Leu	Glu	Gln	Phe	Val	Ala	Pro	
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Leu Leu Asn Val Thr Glu Asn Val Leu Ile Pro Asn Ser Phe Asn Leu
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Thr Val Thr Asp Glu Tyr Ile Gln Thr Arg Met Asp Lys Val Gln Ile
595 600 605

Asn Cys Leu Gln Tyr Ile Cys Gly Asn Ser Leu Glu Cys Arg Asn Leu
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Phe Gln Gln Tyr Gly Pro Val Cys Asp Asn Ile Leu Ser Val Val Asn
625 630 635 640

Ser Val Gly Gln Lys Glu Asp Met Glu Leu Leu Asn Phe Tyr Ser Ser
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Thr Lys Pro Ala Gly Phe Asn Thr Pro Val Leu Ser Asn Val Ser Thr
660 665 670

Gly Glu Phe Asn Ile Thr Leu Phe Leu Thr Thr Pro Ser Ser Pro Arg
675 680 685

Arg Arg Ser Phe Ile Glu Asp Leu Leu Phe Thr Ser Val Glu Ser Val
690 695 700

Gly Leu Pro Thr Asp Asp Ala Tyr Lys Asn Cys Thr Ala Gly Pro Leu
705 710 715 720

Gly Phe Leu Lys Asp Leu Ala Cys Ala Arg Glu Tyr Asn Gly Leu Leu
725 730 735

Val Leu Pro Pro Ile Ile Thr Ala Glu Met Gln Thr Leu Tyr Thr Ser
740 745 750

Ser Leu Val Ala Ser Met Ala Phe Gly Gly Ile Thr Ala Ala Gly Ala
755 760 765

Ile Pro Phe Ala Thr Gln Leu Gln Ala Arg Ile Asn His Leu Gly Ile
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Thr Gln Ser Leu Leu Leu Lys Asn Gln Glu Lys Ile Ala Ala Ser Phe

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Ala	Leu	Gln	Gln	Ile	Gln	Asp	Val	Val	Asn	Lys	Gln	Ser	Ala	Ile	Leu			
			820					825					830					
Thr	Glu	Thr	Met	Ala	Ser	Leu	Asn	Lys	Asn	Phe	Gly	Ala	Ile	Ser	Ser			
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Val	Ile	Gln	Glu	Ile	Tyr	Gln	Gln	Leu	Asp	Ala	Ile	Gln	Ala	Asn	Ala			
	850					855					860							
Gln	Val	Asp	Arg	Leu	Ile	Thr	Gly	Arg	Leu	Ser	Ser	Leu	Ser	Val	Leu			
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Ala	Ser	Ala	Lys	Gln	Ala	Glu	Tyr	Ile	Arg	Val	Ser	Gln	Gln	Arg	Glu			
				885					890					895				
Leu	Ala	Thr	Gln	Lys	Ile	Asn	Glu	Cys	Val	Lys	Ser	Gln	Ser	Ile	Arg			
			900					905					910					
Tyr	Ser	Phe	Cys	Gly	Asn	Gly	Arg	His	Val	Leu	Thr	Ile	Pro	Gln	Asn			
		915					920					925						
Ala	Pro	Asn	Gly	Ile	Val	Phe	Ile	His	Phe	Ser	Tyr	Thr	Pro	Asp	Ser			
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				965					970					975				
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			980					985					990					
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Asn Tyr Val Ser Val Asn Lys Thr Val Ile Thr Thr Phe Val Asp
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Asn Asp Asp Phe Asp Phe Asn Asp Glu Leu Ser Lys Trp Trp Asn
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Asp Thr Lys His Glu Leu Pro Asp Phe Asp Lys Phe Asn Tyr Thr
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Val Pro Ile Leu Asp Ile Asp Ser Glu Ile Asp Arg Ile Gln Gly
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Val Ile Gln Gly Leu Asn Asp Ser Leu Ile Asp Leu Glu Lys Leu
 1070 1075 1080

Ser Ile Leu Lys Thr Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu
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Ala Ile Ala Phe Ala Thr Ile Ile Phe Ile Leu Ile Leu Gly Trp
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Val Phe Phe Met Thr Gly Cys Cys Gly Cys Cys Cys Gly Cys Phe
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Gly Ile Met Pro Leu Met Ser Lys Cys Gly Lys Lys Ser Ser Tyr
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Lys Lys Ser Val
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 <213> Virus de bronquitis infecciosa aviar

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Met Leu Val Thr Pro Leu Leu Leu Val Thr Leu Leu Cys Ala Leu Cys
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Ser Ala Ala Leu Tyr Asp Ser Ser Ser Tyr Val Tyr Tyr Tyr Gln Ser
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Ala Phe Arg Pro Pro Asp Gly Trp His Leu His Gly Gly Ala Tyr Ala
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Val Val Asn Ile Ser Ser Glu Ser Asn Asn Ala Gly Ser Ser Ser Gly
50 55 60

Cys Thr Val Gly Ile Ile His Gly Gly Arg Val Val Asn Ala Ser Ser
65 70 75 80

Ile Ala Met Thr Ala Pro Ser Ser Gly Met Ala Trp Ser Ser Ser Gln
85 90 95

Phe Cys Thr Ala Tyr Cys Asn Phe Ser Asp Thr Thr Val Phe Val Thr
100 105 110

His Cys Tyr Lys His Gly Gly Cys Pro Ile Thr Gly Met Leu Gln Gln
115 120 125

His Ser Ile Arg Val Ser Ala Met Lys Asn Gly Gln Leu Phe Tyr Asn
130 135 140

Leu Thr Val Ser Val Ala Lys Tyr Pro Thr Phe Lys Ser Phe Gln Cys
145 150 155 160

Val Asn Asn Leu Thr Ser Val Tyr Leu Asn Gly Asp Leu Val Tyr Thr
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Ser Asn Glu Thr Thr Asp Val Thr Ser Ala Gly Val Tyr Phe Lys Ala
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Gly Gly Pro Ile Thr Tyr Lys Val Met Arg Glu Val Arg Ala Leu Ala
195 200 205

Tyr Phe Val Asn Gly Thr Ala Gln Asp Val Ile Leu Cys Asp Gly Ser
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Pro Arg Gly Leu Leu Ala Cys Gln Tyr Asn Thr Gly Asn Phe Ser Asp
225 230 235 240

Gly Phe Tyr Pro Phe Thr Asn Ser Ser Leu Val Lys Gln Lys Phe Ile
245 250 255

Val Tyr Arg Glu Asn Ser Val Asn Thr Thr Cys Thr Leu His Asn Phe
260 265 270

Thr Phe His Asn Glu Thr Gly Ala Asn Pro Asn Pro Ser Gly Val Gln
275 280 285

Asn Ile Gln Thr Tyr Gln Thr Gln Thr Ala Gln Ser Gly Tyr Tyr Asn
290 295 300

Phe Asn Phe Ser Phe Leu Ser Ser Phe Val Tyr Lys Glu Ser Asn Phe
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Met Tyr Gly Ser Tyr His Pro Ser Cys Asn Phe Arg Leu Glu Thr Ile
325 330 335

Asn Asn Gly Leu Trp Phe Asn Ser Leu Ser Val Ser Ile Ala Tyr Gly
340 345 350

Pro Leu Gln Gly Gly Cys Lys Gln Ser Val Phe Ser Gly Arg Ala Thr
355 360 365

Cys Cys Tyr Ala Tyr Ser Tyr Gly Gly Pro Leu Leu Cys Lys Gly Val
370 375 380

Tyr Ser Gly Glu Leu Asp His Asn Phe Glu Cys Gly Leu Leu Val Tyr
385 390 395 400

Val Thr Lys Ser Gly Gly Ser Arg Ile Gln Thr Ala Thr Glu Pro Pro
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Val Ile Thr Gln His Asn Tyr Asn Asn Ile Thr Leu Asn Thr Cys Val
420 425 430

Asp Tyr Asn Ile Tyr Gly Arg Thr Gly Gln Gly Phe Ile Thr Asn Val
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Thr Asp Ser Ala Val Ser Tyr Asn Tyr Leu Ala Asp Ala Gly Leu Ala
450 455 460

Ile Leu Asp Thr Ser Gly Ser Ile Asp Ile Phe Val Val Gln Ser Glu
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Tyr Gly Leu Asn Tyr Tyr Lys Val Asn Pro Cys Glu Asp Val Asn Gln
485 490 495

Gln Phe Val Val Ser Gly Gly Lys Leu Val Gly Ile Leu Thr Ser Arg
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Asn Glu Thr Gly Ser Gln Leu Leu Glu Asn Gln Phe Tyr Ile Lys Ile
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Thr Asn Gly Thr Arg Arg Phe Arg Arg Ser Ile Thr Glu Ser Val Glu
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Asn Cys Pro Tyr Val Ser Tyr Gly Lys Phe Cys Ile Lys Pro Asp Gly
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Ser Ile Ala Thr Ile Val Pro Lys Gln Leu Glu Gln Phe Val Ala Pro
565 570 575

Leu Leu Asn Val Thr Glu Asn Val Leu Ile Pro Asn Ser Phe Asn Leu
580 585 590

Thr Val Thr Asp Glu Tyr Ile Gln Thr Arg Met Asp Lys Val Gln Ile
595 600 605

Asn Cys Leu Gln Tyr Ile Cys Gly Asn Ser Leu Glu Cys Arg Asn Leu
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Phe Gln Gln Tyr Gly Pro Val Cys Asp Asn Ile Leu Ser Val Val Asn
625 630 635 640

Ser Val Gly Gln Lys Glu Asp Met Glu Leu Leu Asn Phe Tyr Ser Ser
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Thr Lys Pro Ala Gly Phe Asn Thr Pro Val Leu Ser Asn Val Ser Thr
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Gly Glu Phe Asn Ile Thr Leu Phe Leu Thr Thr Pro Ser Ser Pro Arg
675 680 685

Arg Arg Ser Phe Ile Glu Asp Leu Leu Phe Thr Ser Val Glu Ser Val
690 695 700

Gly Leu Pro Thr Asp Asp Ala Tyr Lys Asn Cys Thr Ala Gly Pro Leu
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Gly Phe Leu Lys Asp Leu Ala Cys Ala Arg Glu Tyr Asn Gly Leu Leu
725 730 735

Val Leu Pro Pro Ile Ile Thr Ala Glu Met Gln Thr Leu Tyr Thr Ser
740 745 750

Ser Leu Val Ala Ser Met Ala Phe Gly Gly Ile Thr Ala Ala Gly Ala
755 760 765

Ile Pro Phe Ala Thr Gln Leu Gln Ala Arg Ile Asn His Leu Gly Ile
770 775 780

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

Asn Lys Ala Ile Gly His Met Gln Glu Gly Phe Arg Ser Thr Ser Leu
805 810 815

Ala Leu Gln Gln Ile Gln Asp Val Val Asn Lys Gln Ser Ala Ile Leu
820 825 830

Thr Glu Thr Met Ala Ser Leu Asn Lys Asn Phe Gly Ala Ile Ser Ser
835 840 845

Val Ile Gln Glu Ile Tyr Gln Gln Leu Asp Ala Ile Gln Ala Asn Ala
850 855 860

Gln Val Asp Arg Leu Ile Thr Gly Arg Leu Ser Ser Leu Ser Val Leu
865 870 875 880

Ala Ser Ala Lys Gln Ala Glu Tyr Ile Arg Val Ser Gln Gln Arg Glu
885 890 895

Leu Ala Thr Gln Lys Ile Asn Glu Cys Val Lys Ser Gln Ser Ile Arg
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Tyr Ser Phe Cys Gly Asn Gly Arg His Val Leu Thr Ile Pro Gln Asn
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Ala Pro Asn Gly Ile Val Phe Ile His Phe Ser Tyr Thr Pro Asp Ser
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Phe Val Asn Val Thr Ala Ile Val Gly Phe Cys Val Lys Pro Ala Asn
945 950 955 960

Ala Ser Gln Tyr Ala Ile Val Pro Ala Asn Gly Arg Gly Ile Phe Ile
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Gln Val Asn Gly Ser Tyr Tyr Ile Thr Ala Arg Asp Met Tyr Met Pro
980 985 990

Arg Ala Ile Thr Ala Gly Asp Ile Val Thr Leu Thr Ser Cys Gln Ala
995 1000 1005

Asn Tyr Val Ser Val Asn Lys Thr Val Ile Thr Thr Phe Val Asp
1010 1015 1020

Asn Asp Asp Phe Asp Phe Asn Asp Glu Leu Ser Lys Trp Trp Asn
1025 1030 1035

Asp Thr Lys His Glu Leu Pro Asp Phe Asp Lys Phe Asn Tyr Thr
1040 1045 1050

Val Pro Ile Leu Asp Ile Asp Ser Glu Ile Asp Arg Ile Gln Gly
1055 1060 1065

Val Ile Gln Gly Leu Asn Asp Ser Leu Ile Asp Leu Glu Lys Leu
1070 1075 1080

Ser Ile Leu Lys Thr Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu
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Ala Ile Ala Phe Ala Thr Ile Ile Phe Ile Leu Ile Leu Gly Trp
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Val Phe Phe Met Thr Gly Cys Cys Gly Cys Cys Cys Gly Cys Phe
1115 1120 1125

Gly Ile Met Pro Leu Met Ser Lys Cys Gly Lys Lys Ser Ser Tyr
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Tyr Thr Thr Phe Asp Asn Asp Val Val Thr Glu Gln Tyr Arg Pro
1145 1150 1155

Lys Lys Ser Val
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<212> PRT
<213> Virus de bronquitis infecciosa aviar

<400> 3

Met Leu Asp Lys Pro Leu Leu Leu Val Thr Leu Trp Tyr Ala Leu Cys
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Ser Ala Leu Leu Tyr Asp Asn Asn Thr Tyr Val Tyr Tyr Tyr Gln Ser
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Ala Phe Arg Pro Gly Pro Gly Trp His Leu Tyr Gly Gly Ala Tyr Ala
35 40 45

Val Asp Arg Val Phe Asn Glu Thr Asn Asn Ala Gly Ser Ala Ser Asp
50 55 60

Cys Thr Ala Gly Thr Phe Tyr Glu Ser His Asn Ile Ser Ala Ser Ser
65 70 75 80

Val Ala Met Thr Val Pro His Asn Gly Met Ser Trp Ser Ala Ser Gln
85 90 95

Phe Cys Thr Ala His Cys Asn Phe Ser Asp Phe Thr Val Phe Val Thr
100 105 110

His Cys Phe Lys Asn Gln Leu Gly Ser Cys Pro Leu Thr Gly Met Ile
115 120 125

Pro Gln Asn His Ile Arg Ile Ser Ala Met Arg Asp Gly Val Leu Phe
130 135 140

Tyr Asn Leu Thr Val Ser Val Ser Lys Tyr Pro Arg Phe Lys Ser Leu
145 150 155 160

Gln Cys Val Ser Asn Ser Thr Ser Val Tyr Val Asn Gly Asp Leu Val
165 170 175

Phe Thr Ser Asn Glu Thr Ser Tyr Val Thr Gly Ala Gly Val Tyr Phe
180 185 190

Lys Ser Gly Gly Pro Val Thr Tyr Lys Val Met Lys Glu Val Lys Ala
195 200 205

Leu Ala Tyr Phe Ile Asn Gly Thr Ala Gln Glu Val Ile Leu Cys Asp
210 215 220

Asn Ser Pro Arg Gly Leu Leu Ala Cys Gln Tyr Asn Thr Gly Asn Phe
225 230 235 240

Ser Asp Gly Phe Tyr Pro Phe Thr Asn His Ser Leu Val Lys Asp Arg
245 250 255

Phe Ile Val Tyr Arg Glu Ser Ser Thr Asn Thr Thr Cys Lys Leu Thr
260 265 270

Asn Phe Ser Phe Thr Asn Val Ser Asn Ala Ser Pro Asn Ser Gly Gly
275 280 285

Val Asp Thr Phe Gln Leu Tyr Gln Thr Ser Thr Ala Gln Asp Gly Tyr
290 295 300

Tyr Asn Phe Asn Leu Ser Phe Leu Ser Ser Phe Val Tyr Lys Pro Ser

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Asp	Phe	Met	Tyr	Gly	Ser	Tyr	His	Pro	His	Cys	Lys	Phe	Arg	Pro	Glu
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Asn	Ile	Asn	Asn	Gly	Leu	Trp	Phe	Asn	Ser	Leu	Ser	Val	Ser	Leu	Thr
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Tyr	Gly	Pro	Ile	Gln	Gly	Gly	Cys	Lys	Gln	Ser	Val	Phe	Ser	Asn	Arg
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Ala	Thr	Cys	Cys	Tyr	Ala	Tyr	Ser	Tyr	Gln	Gly	Pro	Ser	Arg	Cys	Lys
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Gly	Val	Tyr	Arg	Gly	Glu	Leu	Thr	Gln	Tyr	Phe	Glu	Cys	Gly	Leu	Leu
385					390					395					400
Val	Tyr	Val	Thr	Lys	Ser	Asp	Gly	Ser	Arg	Ile	Gln	Thr	Arg	Ser	Glu
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Pro	Leu	Val	Leu	Thr	Gln	Tyr	Asn	Tyr	Asn	Asn	Ile	Thr	Leu	Asn	Lys
			420					425					430		
Cys	Val	Glu	Tyr	Asn	Ile	Tyr	Gly	Arg	Val	Gly	Gln	Gly	Phe	Ile	Thr
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Asn	Val	Thr	Glu	Ala	Thr	Ala	Asn	Tyr	Ser	Tyr	Leu	Ala	Asp	Gly	Gly
	450					455					460				
Leu	Ala	Ile	Leu	Asp	Thr	Ser	Gly	Ala	Ile	Asp	Ile	Phe	Val	Val	Gln
465					470					475					480
Gly	Ala	Tyr	Gly	Leu	Asn	Tyr	Tyr	Lys	Val	Asn	Pro	Cys	Glu	Asp	Val
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Asn	Gln	Gln	Phe	Val	Val	Ser	Gly	Gly	Asn	Leu	Val	Gly	Ile	Leu	Thr
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Ser	His	Asn	Glu	Thr	Gly	Ser	Glu	Ser	Ile	Glu	Asn	Gln	Phe	Tyr	Ile
		515					520					525			

Lys Leu Thr Asn Gly Thr Arg Arg Ser Arg Arg Ser Val Thr Gly Asn
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Val Thr Asn Cys Pro Tyr Val Ser Tyr Gly Lys Phe Cys Ile Lys Pro
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Asp Gly Ser Leu Ser Ile Ile Val Pro Gln Glu Leu Glu Gln Phe Val
565 570 575

Ala Pro Leu Phe Asn Val Thr Glu His Val Leu Ile Pro Asp Ser Phe
580 585 590

Asn Leu Thr Val Thr Asp Glu Tyr Ile Gln Thr Arg Met Asp Lys Val
595 600 605

Gln Ile Ile Cys Leu Gln Tyr Val Cys Gly Asn Ser Ile Glu Cys Arg
610 615 620

Lys Leu Phe Gln Gln Tyr Gly Pro Val Cys Asp Asn Ile Leu Ser Val
625 630 635 640

Val Asn Gly Val Gly Gln Arg Glu Asp Met Glu Leu Leu Ser Phe Tyr
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Ser Ser Thr Lys Pro Ser Gly Tyr Asn Thr Pro Ile Phe Asn Asn Val
660 665 670

Ser Thr Gly Asp Phe Asn Ile Ser Leu Leu Leu Thr Pro Pro Asn Ser
675 680 685

Pro Thr Gly Arg Ser Phe Ile Glu Asp Leu Leu Phe Thr Ser Val Glu
690 695 700

Ser Val Gly Leu Pro Thr Asp Glu Glu Tyr Lys Lys Cys Thr Ala Gly
705 710 715 720

Pro Leu Gly Phe Val Lys Asp Leu Val Cys Ala Arg Glu Tyr Asn Gly
725 730 735

Leu Leu Val Leu Pro Pro Ile Ile Thr Ala Glu Met Gln Thr Met Tyr

740	745	750
Thr Ser Ser Leu Val Ala Ser Met Ala Leu Gly Gly Ile Thr Ala Ala		
755	760	765
Gly Ala Ile Pro Phe Ala Thr Gln Leu Gln Ala Arg Ile Asn His Leu		
770	775	780
Gly Ile Thr Asn Ser Leu Leu Leu Lys Asn Gln Glu Lys Ile Ala Ala		
785	790	800
Ser Phe Asn Lys Ala Ile Gly His Met Gln Glu Gly Phe Lys Ser Thr		
805	810	815
Ser Leu Ala Leu Gln Gln Ile Gln Asp Val Val Asn Lys Gln Ser Ser		
820	825	830
Ile Leu Thr Glu Thr Met Gln Ser Leu Asn Lys Asn Phe Gly Ala Ile		
835	840	845
Ser Ser Val Ile Gln Asp Ile Tyr Gln Gln Leu Asp Ala Ile Gln Ala		
850	855	860
Asp Ala Gln Val Asp Arg Leu Ile Thr Gly Arg Leu Ser Ser Leu Ser		
865	870	875
Val Leu Ala Ser Ala Lys Gln Ala Glu Tyr His Arg Val Ser Gln Gln		
885	890	895
Arg Glu Leu Ala Thr Gln Lys Ile Asn Glu Cys Val Lys Ser Gln Ser		
900	905	910
Asn Arg Tyr Ser Phe Cys Gly Asn Gly Arg His Val Leu Thr Ile Pro		
915	920	925
Gln Asn Ala Pro Asn Gly Ile Val Phe Ile His Phe Thr Tyr Thr Pro		
930	935	940
Glu Ser Phe Val Asn Val Thr Ala Ile Val Gly Phe Cys Val Asn Pro		
945	950	955
		960

Ala Asn Ala Ser His Tyr Ala Ile Val Pro Val Asn Gly Arg Gly Val
965 970 975

Phe Ile Glu Val Asn Gly Ser Tyr Tyr Ile Thr Ala Arg Asp Met Tyr
980 985 990

Met Pro Arg Asp Ile Thr Ala Gly Asp Ile Val Thr Leu Thr Ser Cys
995 1000 1005

Gln Ala Asn Tyr Val Asn Val Asn Lys Thr Val Ile Asn Thr Phe
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Val Glu Asp Asp Asp Phe Asp Phe Tyr Asp Glu Leu Ser Lys Trp
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Trp Asn Asp Thr Lys His Glu Leu Pro Asp Phe Asp Glu Phe Asn
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Tyr Thr Val Pro Val Leu Asn Ile Ser Asn Glu Ile Asp Arg Ile
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Gln Gln Val Ile Gln Gly Leu Asn Asp Ser Leu Ile Asp Leu Glu
1070 1075 1080

Thr Leu Ser Ile Leu Lys Thr Tyr Ile Lys Trp Pro Trp Tyr Val
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Trp Leu Ala Ile Ala Phe Leu Thr Ile Ile Phe Ile Leu Val Leu
1100 1105 1110

Cys Trp Ile Phe Phe Met Thr Gly Cys Cys Gly Cys Cys Cys Gly
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Cys Phe Gly Ile Ile Pro Leu Met Ser Lys Cys Gly Lys Lys Ser
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Ser Tyr Tyr Thr Thr Phe Asp Asn Asp Val Val Thr
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<213> Virus de bronquitis infecciosa aviar

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Met Leu Val Lys Ser Leu Phe Leu Val Thr Ile Leu Cys Ala Leu Cys
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Ser Ala Asn Leu Phe Asp Ser Asp Asn Asn Tyr Val Tyr Tyr Tyr Gln
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Ser Ala Phe Arg Pro Pro Asn Gly Trp His Leu Gln Gly Gly Ala Tyr
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Ala Val Val Ser Ser Thr Asn Tyr Thr Asn Asn Ala Gly Ser Ala His
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Gly Cys Thr Val Gly Val Ile Lys Asp Val Tyr Asn Gln Ser Val Ala
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Ser Ile Ala Met Thr Ala Pro Leu Gln Gly Met Ala Trp Ser Lys Ser
85 90 95

Gln Phe Cys Ser Ala His Cys Asn Phe Ser Glu Ile Thr Val Phe Val
100 105 110

Thr His Cys Tyr Ser Ser Gly Ser Gly Ser Cys Pro Ile Thr Gly Met
115 120 125

Ile Pro Arg Asp His Ile Arg Ile Ser Ala Met Lys Asn Gly Ser Leu
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Phe Tyr Asn Leu Thr Val Ser Val Ser Lys Tyr Pro Asn Phe Lys Ser
145 150 155 160

Phe Gln Cys Val Asn Asn Phe Thr Ser Val Tyr Leu Asn Gly Asp Leu
165 170 175

Val Phe Thr Ser Asn Lys Thr Thr Asp Val Thr Ser Ala Gly Val Tyr
180 185 190

Phe Lys Ala Gly Gly Pro Val Asn Tyr Ser Ile Met Lys Glu Phe Lys
195 200 205

Val Leu Ala Tyr Phe Val Asn Gly Thr Ala Gln Asp Val Val Leu Cys
210 215 220

Asp Asn Ser Pro Lys Gly Leu Leu Ala Cys Gln Tyr Asn Thr Gly Asn
225 230 235 240

Phe Ser Asp Gly Phe Tyr Pro Phe Thr Asn Ser Thr Leu Val Arg Glu
245 250 255

Lys Phe Ile Val Tyr Arg Glu Ser Ser Val Asn Thr Thr Cys Ala Leu
260 265 270

Thr Asn Phe Thr Phe Ser Asn Val Ser Asn Ala Gln Pro Asn Ser Gly
275 280 285

Gly Val Asn Thr Phe His Leu Tyr Gln Thr Gln Thr Ala Gln Ser Gly
290 295 300

Tyr Tyr Asn Phe Asn Leu Ser Phe Leu Ser Gln Phe Val Tyr Lys Ala
305 310 315 320

Ser Asp Phe Met Tyr Gly Ser Tyr His Pro Ser Cys Ser Phe Arg Pro
325 330 335

Glu Thr Ile Asn Ser Gly Leu Trp Phe Asn Ser Leu Ser Val Ser Leu
340 345 350

Thr Tyr Gly Pro Leu Gln Gly Gly Cys Lys Gln Ser Val Phe Ser Gly
355 360 365

Lys Ala Thr Cys Cys Tyr Ala Tyr Ser Tyr Arg Gly Pro Met Ala Cys
370 375 380

Lys Gly Val Tyr Ser Gly Glu Leu Ser Thr Asn Phe Glu Cys Gly Leu
385 390 395 400

Leu Val Tyr Val Thr Lys Ser Asp Gly Ser Arg Ile Gln Thr Arg Thr
405 410 415

Glu Pro Leu Val Leu Thr Gln Tyr Asn Tyr Asn Asn Ile Thr Leu Asp
420 425 430

Lys Cys Val Ala Tyr Asn Ile Tyr Gly Arg Val Gly Gln Gly Phe Ile
435 440 445

Thr Asn Val Thr Asp Ser Ala Ala Asn Phe Ser Tyr Leu Ala Asp Gly
450 455 460

Gly Leu Ala Ile Leu Asp Thr Ser Gly Ala Ile Asp Val Phe Val Val
465 470 475 480

Gln Gly Ile Tyr Gly Leu Asn Tyr Tyr Lys Val Asn Pro Cys Glu Asp
485 490 495

Val Asn Gln Gln Phe Val Val Ser Gly Gly Asn Ile Val Gly Ile Leu
500 505 510

Thr Ser Arg Asn Glu Thr Gly Ser Glu Gln Val Glu Asn Gln Phe Tyr
515 520 525

Val Lys Leu Thr Asn Ser Ser His Arg Arg Lys Arg Ser Ile Gly Gln
530 535 540

Asn Val Thr Ser Cys Pro Tyr Val Ser Tyr Gly Arg Phe Cys Ile Glu
545 550 555 560

Pro Asp Gly Ser Leu Lys Met Ile Val Pro Glu Glu Leu Lys Gln Phe
565 570 575

Val Ala Pro Leu Leu Asn Ile Thr Glu Ser Val Leu Ile Pro Asn Ser
580 585 590

Phe Asn Leu Thr Val Thr Asp Glu Tyr Ile Gln Thr Arg Met Asp Lys
595 600 605

Val Gln Ile Asn Cys Leu Gln Tyr Val Cys Gly Asn Ser Leu Glu Cys
610 615 620

Arg Lys Leu Phe Gln Gln Tyr Gly Pro Val Cys Asp Asn Ile Leu Ser
625 630 635 640

Val Val Asn Ser Val Ser Gln Lys Glu Asp Met Glu Leu Leu Ser Phe
645 650 655

Tyr Ser Ser Thr Lys Pro Lys Gly Tyr Asp Thr Pro Val Leu Ser Asn
660 665 670

Val Ser Thr Gly Glu Phe Asn Ile Ser Leu Leu Leu Lys Pro Pro Ser
675 680 685

Ser Pro Ser Gly Arg Ser Phe Ile Glu Glu Leu Leu Phe Thr Ser Val
690 695 700

Glu Thr Val Gly Leu Pro Thr Asp Ala Glu Tyr Lys Lys Cys Thr Ala
705 710 715 720

Gly Pro Leu Gly Thr Leu Lys Asp Leu Ile Cys Ala Arg Glu Tyr Asn
725 730 735

Gly Leu Leu Val Leu Pro Pro Ile Ile Thr Ala Asp Met Gln Thr Met
740 745 750

Tyr Thr Ala Ser Leu Val Gly Ala Met Ala Phe Gly Gly Ile Thr Ser
755 760 765

Ala Ala Ala Ile Pro Phe Ala Thr Gln Ile Gln Ala Arg Ile Asn His
770 775 780

Leu Gly Ile Thr Gln Ser Leu Leu Met Lys Asn Gln Glu Lys Ile Ala
785 790 795 800

Ala Ser Phe Asn Lys Ala Ile Gly His Met Gln Glu Gly Phe Arg Ser
805 810 815

Thr Ser Leu Ala Leu Gln Gln Ile Gln Asp Val Val Asn Lys Gln Ser
820 825 830

Ala Ile Leu Thr Glu Thr Met Asn Ser Leu Asn Lys Asn Phe Gly Ala
835 840 845

Ile Thr Ser Val Ile Gln Asp Ile Tyr Ala Gln Leu Asp Ala Ile Gln
850 855 860

Ala Asp Ala Gln Val Asp Arg Leu Ile Thr Gly Arg Leu Ser Ser Leu
865 870 875 880

Ser Val Leu Ala Ser Ala Lys Gln Ser Glu Tyr Ile Arg Val Ser Gln
885 890 895

Gln Arg Glu Leu Ala Thr Gln Lys Ile Asn Glu Cys Val Lys Ser Gln
900 905 910

Ser Asn Arg Tyr Gly Phe Cys Gly Ser Gly Arg His Val Leu Ser Ile
915 920 925

Pro Gln Asn Ala Pro Asn Gly Ile Val Phe Ile His Phe Thr Tyr Thr
930 935 940

Pro Glu Ser Phe Val Asn Val Thr Ala Ile Val Gly Phe Cys Val Asn
945 950 955 960

Pro Ala Asn Ala Ser Gln Tyr Ala Ile Val Pro Ala Asn Gly Arg Gly
965 970 975

Ile Phe Ile Gln Val Asn Gly Thr Tyr Tyr Ile Thr Ala Arg Asp Met
980 985 990

Tyr Met Pro Arg Asp Ile Thr Ala Gly Asp Ile Val Thr Leu Thr Ser
995 1000 1005

Cys Gln Ala Asn Tyr Val Asn Val Asn Lys Thr Val Ile Thr Thr
1010 1015 1020

Phe Val Glu Asp Asp Asp Phe Asp Phe Asp Asp Glu Leu Ser Lys
1025 1030 1035

Trp Trp Asn Asp Thr Lys His Gln Leu Pro Asp Phe Asp Asp Phe
1040 1045 1050

Asn Tyr Thr Val Pro Ile Leu Asn Ile Ser Gly Glu Ile Asp Tyr
1055 1060 1065

Ile Gln Gly Val Ile Gln Gly Leu Asn Asp Ser Leu Ile Asp Leu
1070 1075 1080

Glu Glu Leu Ser Ile Ile Lys Thr Tyr Ile Lys Trp Pro Trp Tyr
1085 1090 1095

Val Trp Leu Ala Ile Phe Phe Ala Ile Ile Ile Phe Ile Leu Ile
1100 1105 1110

Leu Gly Trp Val Phe Phe Met Thr Gly Cys Cys Gly Cys Cys Cys
1115 1120 1125

Gly Cys Phe Gly Ile Ile Pro Leu Met Ser Lys Cys Gly Lys Lys
1130 1135 1140

Ser Ser Tyr Tyr Thr Thr Phe Asp Asn Asp Val Val Thr
1145 1150 1155

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<213> Virus de bronquitis infecciosa aviar

<400> 5

Met Leu Gly Lys Ser Leu Phe Val Val Thr Leu Leu Phe Ala Leu Cys
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Ser Ala Ala Leu Phe Asp Asn Asn Glu Thr Val Tyr Tyr Tyr Gln Ser
20 25 30

Ala Phe Arg Pro Ala Asp Gly Trp His Leu His Gly Gly Ala Tyr Ala
35 40 45

Val Val Asn Val Ser Leu Gln Thr Ser Asn Ala Gly Thr Val Ser Glu
50 55 60

Cys Ile Ala Gly Ala Ile Ser Trp Ser Lys Glu Phe Ser Ala Ser Ala
65 70 75 80

Val Ala Met Thr Ala Pro Gln Leu Gly Met Thr Trp Ser Thr Arg Gln
85 90 95

Phe Cys Thr Ala His Cys Asn Phe Ser Asp Phe Thr Val Phe Val Thr
100 105 110

His Cys Phe Lys His Gly Thr Gly Leu Cys Pro Leu Thr Gly Phe Ile
115 120 125

Pro Ser Gly Phe Ile Arg Val Ser Ala Met Arg Lys Gly Ser Asn Ser
130 135 140

Leu Phe Tyr Asn Leu Thr Val Ser Val Thr Lys Tyr Pro Arg Phe Lys
145 150 155 160

Ser Leu Gln Cys Val Asn Asn Tyr Thr Ser Val Tyr Leu Asn Gly Asp
165 170 175

Leu Val Phe Thr Ser Asn Glu Thr Lys Pro Val Ser Ala Ala Gly Val
180 185 190

Ser Phe Lys Ala Gly Gly Pro Ile Thr Tyr Lys Ile Met Asn Glu Val
195 200 205

Lys Val Leu Ala Tyr Phe Val Asn Gly Thr Ala Gln Thr Val Ile Pro
210 215 220

Cys Asp Gly Ser Pro Arg Gly Leu Leu Ala Cys Gln Tyr Asn Thr Gly
225 230 235 240

Asn Phe Ser Asp Gly Phe Tyr Pro Tyr Thr Asn Ser Ser Leu Val Lys
245 250 255

Glu Arg Phe Ile Val Tyr Arg Glu Ser Ser Val Asn Thr Ile Cys Val
260 265 270

Leu Thr Asn Phe Thr Phe Ser Asn Val Ser Asn Ala Leu Pro Asn Thr
275 280 285

Gly Asn Val His Ser Ile Val Leu His Gln Thr Gln Thr Ala Gln Ser

290					295					300						
Gly	Tyr	Tyr	Asn	Leu	Asn	Phe	Ser	Phe	Leu	Ser	Gly	Phe	Arg	Tyr	Val	
305					310					315					320	
Glu	Ser	Asp	Phe	Met	Tyr	Gly	Ser	Tyr	His	Pro	Lys	Cys	Ser	Phe	Arg	
				325					330					335		
Pro	Glu	Thr	Ile	Asn	Asn	Gly	Leu	Trp	Phe	Asn	Ser	Leu	Ser	Val	Ser	
			340					345					350			
Leu	Gly	Tyr	Gly	Pro	Leu	Gln	Gly	Gly	Cys	Lys	Gln	Ser	Val	Phe	Asn	
		355					360					365				
Asn	Lys	Ala	Thr	Cys	Cys	Tyr	Ala	Tyr	Ser	Tyr	Asn	Gly	Pro	Thr	Leu	
	370					375					380					
Cys	Lys	Gly	Val	Tyr	Ser	Gly	Glu	Leu	Gln	Lys	Thr	Phe	Glu	Cys	Gly	
385						390					395				400	
Leu	Leu	Val	Phe	Val	Thr	Lys	Ser	Asp	Gly	Ser	Arg	Ile	Gln	Thr	Arg	
				405					410					415		
Asn	Glu	Pro	Leu	Val	Leu	Thr	Gln	His	Asn	Tyr	Asn	Asn	Ile	Thr	Leu	
			420					425					430			
Asn	Lys	Cys	Val	Glu	Tyr	Asn	Ile	Tyr	Gly	Arg	Val	Gly	Gln	Gly	Leu	
		435					440					445				
Ile	Thr	Asn	Ile	Thr	Asp	Ser	Ala	Ala	Asn	His	Gly	Tyr	Leu	Ala	Asp	
	450					455					460					
Gly	Gly	Leu	Ala	Val	Leu	Asp	Thr	Ser	Gly	Ala	Ile	Asp	Val	Phe	Val	
465						470					475				480	
Val	Gln	Gly	Val	Tyr	Gly	Leu	Asn	Tyr	Tyr	Lys	Val	Asn	Pro	Cys	Glu	
				485				490						495		
Asp	Val	Asn	Gln	Gln	Phe	Val	Val	Ser	Gly	Gly	Gln	Leu	Val	Gly	Ile	
			500					505					510			

Leu Thr Ser Arg Asn Glu Thr Gly Ser Gln Pro Ile Glu Asn Arg Phe
515 520 525

Tyr Val Lys Phe Ser Asn Ser Arg Arg Arg Thr Gly Arg Ser Thr Ile
530 535 540

Ala Asn Val Thr Asn Cys Pro Tyr Val Ser Tyr Gly Lys Phe Cys Ile
545 550 555 560

Lys Pro Asp Gly Ser Val Leu Glu Ile Val Pro Gln Glu Ile Glu His
565 570 575

Phe Val Ala Pro Leu Leu Asn Val Thr Glu His Val Leu Ile Pro Asn
580 585 590

Ser Phe Asn Leu Thr Val Thr Asp Glu Tyr Ile Gln Thr Arg Met Asp
595 600 605

Lys Ile Gln Ile Asn Cys Leu Gln Tyr Val Cys Gly Asn Ser Ile Glu
610 615 620

Cys Arg Lys Leu Phe Gln Gln Tyr Gly Pro Val Cys Asp Asn Ile Leu
625 630 635 640

Ser Val Val Asn Thr Val Gly Gln Arg Glu Asp Met Glu Leu Leu Ser
645 650 655

Phe Tyr Ser Ser Thr Lys Pro Lys Asp Tyr Asn Val Pro Ile Phe Ser
660 665 670

Asn Val Ser Thr Gly Asp Phe Asn Ile Ser Leu Leu Leu Thr Pro Pro
675 680 685

Asn Ser Pro Thr Gly Arg Ser Phe Ile Glu Asp Ile Leu Phe Thr Ser
690 695 700

Val Glu Ser Val Gly Leu Pro Thr Asp Glu Glu Tyr Lys Lys Cys Thr
705 710 715 720

Ala Gly Pro Leu Gly Phe Val Lys Asp Leu Val Cys Ala Arg Glu Tyr

725					730					735						
Asn	Gly	Leu	Leu	Val	Leu	Pro	Pro	Ile	Ile	Thr	Ala	Asp	Met	Gln	Thr	
740					745					750						
Met	Tyr	Thr	Ser	Thr	Leu	Val	Ala	Ser	Met	Ala	Leu	Gly	Gly	Ile	Thr	
755					760					765						
Ala	Ala	Gly	Ala	Ile	Pro	Phe	Ala	Thr	Gln	Leu	Gln	Ala	Arg	Ile	Asn	
770					775					780						
His	Leu	Gly	Ile	Thr	Gln	Ser	Leu	Leu	Leu	Lys	Asn	Gln	Glu	Lys	Ile	
785					790					795					800	
Ala	Ala	Ser	Phe	Asn	Lys	Ala	Ile	Gly	His	Met	Gln	Glu	Gly	Phe	Arg	
805					810					815						
Ser	Thr	Ser	Leu	Ala	Leu	Gln	Gln	Ile	Gln	Asp	Val	Val	Asn	Lys	Gln	
820					825					830						
Ser	Ser	Ile	Leu	Thr	Glu	Thr	Met	Ala	Ser	Leu	Asn	Lys	Asn	Phe	Gly	
835					840					845						
Ala	Ile	Ser	Ser	Val	Leu	Gln	Asp	Ile	Tyr	Gln	Gln	Leu	Asp	Ala	Ile	
850					855					860						
Gln	Ala	Asp	Ala	Gln	Val	Asp	Arg	Ile	Ile	Thr	Gly	Arg	Leu	Ser	Ser	
865					870					875					880	
Leu	Ser	Val	Leu	Ala	Ser	Ala	Lys	Gln	Ser	Glu	Tyr	Tyr	Arg	Val	Ser	
885					890					895						
Gln	Gln	Arg	Glu	Leu	Ala	Thr	Gln	Lys	Ile	Asn	Glu	Cys	Val	Lys	Ser	
900					905					910						
Gln	Ser	Thr	Arg	Tyr	Ser	Phe	Cys	Gly	Asn	Gly	Arg	His	Val	Leu	Thr	
915					920					925						
Ile	Pro	Gln	Asn	Ala	Pro	Asn	Gly	Ile	Val	Phe	Ile	His	Phe	Thr	Tyr	
930					935					940						

Thr Pro Glu Ser Phe Val Asn Val Thr Ala Ile Val Gly Phe Cys Val
945 950 955 960

Asn Pro Pro Asn Ala Ser Gln Tyr Ala Leu Val Pro Ala Asn Gly Arg
965 970 975

Gly Ile Phe Ile Gln Val Asn Gly Ser Tyr Tyr Ile Thr Ala Arg Asp
980 985 990

Met Tyr Met Pro Arg Asp Ile Thr Ala Gly Asp Ile Val Thr Leu Thr
995 1000 1005

Ser Cys Gln Ala Asn Tyr Val Ser Val Asn Arg Thr Val Ile Thr
1010 1015 1020

Thr Phe Val Asp Asn Asp Asp Phe Asp Phe Asp Asp Glu Leu Ser
1025 1030 1035

Lys Trp Trp Asn Asp Thr Lys His Glu Leu Pro Asp Phe Asp Glu
1040 1045 1050

Phe Asn Tyr Thr Ile Pro Val Leu Asn Ile Ser Asn Glu Ile Asp
1055 1060 1065

Ile Ile Gln Glu Val Ile Arg Gly Leu Asn Asp Ser Leu Ile Asp
1070 1075 1080

Leu Glu Ala Leu Ser Ile Leu Lys Thr Tyr Ile Lys Trp Pro Trp
1085 1090 1095

Tyr Val Trp Leu Ala Ile Ala Phe Leu Thr Ile Ile Phe Ile Leu
1100 1105 1110

Val Leu Cys Trp Ile Phe Phe Met Thr Gly Cys Cys Gly Cys Cys
1115 1120 1125

Cys Gly Cys Phe Gly Ile Met Pro Leu Met Ser Lys Cys Gly Lys
1130 1135 1140

Lys Ser Ser Tyr Tyr Thr Thr Phe Asp Asn Asp Val Val

1145

1150

1155

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<211> 1156

<212> PRT

<213> Virus de bronquitis infecciosa aviar

<400> 6

Met Leu Val Lys Ser Leu Phe Ile Val Thr Leu Leu Phe Ala Leu Cys
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Ser Ala Ala Leu Phe Asp Asn Asn Gln Ala Val Tyr Tyr Tyr Gln Ser
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Ala Phe Arg Pro Ser Ser Gly Trp His Lys His Gly Gly Ala Tyr Ala
 35 40 45

Val Ala Asn Val Ser Leu Glu Tyr Ala Asn Ala Gly Ser Ser Thr His
 50 55 60

Cys Thr Ala Gly Ala Ile Tyr Trp Ser Lys Asn Phe Thr Ala Ser Ser
 65 70 75 80

Val Ala Met Thr Ala Pro Gly Thr Gly Met Ser Trp Ser Thr Ala Gln
 85 90 95

Phe Cys Thr Ala His Cys Asn Phe Ser Asp Phe Thr Val Phe Val Thr
 100 105 110

His Cys Tyr Lys Ser Gly Asp Val Cys Pro Leu Thr Gly Leu Ile Pro
 115 120 125

Ser Gly Tyr Ile Arg Ile Ser Ala Met Thr Lys Gly Thr Thr Ser Leu
 130 135 140

Phe Tyr Asn Leu Thr Val Pro Val Thr Lys Tyr Pro Lys Phe Lys Ser
 145 150 155 160

Leu Gln Cys Val Asp Asn Phe Thr Ser Val Tyr Leu Asn Gly Asp Leu
 165 170 175

Val Phe Thr Ser Asn Glu Thr Lys Asp Val Ser Ala Ala Gly Val His
180 185 190

Phe Lys Ala Gly Gly Pro Ile Thr Tyr Lys Val Met Glu Lys Val Asp
195 200 205

Val Leu Ala Tyr Phe Val Asn Gly Thr Ala Gln Asp Val Ile Leu Cys
210 215 220

Asp Asn Ser Pro Arg Gly Leu Leu Ala Cys Gln Tyr Asn Thr Gly Asn
225 230 235 240

Phe Ser Asp Gly Phe Tyr Pro Phe Thr Asn Ile Ser Leu Val Lys Glu
245 250 255

Lys Phe Ile Val Tyr Arg Glu Thr Ser Val Asn Thr Thr Cys Val Leu
260 265 270

Thr Asn Phe Thr Phe Thr Asn Val Ser Asn Ala Leu Pro Asn Thr Gly
275 280 285

Gly Val Asn Thr Ile Asn Ile Tyr Gln Thr Gln Thr Ala Gln Ser Gly
290 295 300

Cys Tyr Asn Phe Asn Phe Ser Phe Leu Ser Ser Phe Val Tyr Lys Gln
305 310 315 320

Ser Asp Phe Met Tyr Gly Ser Tyr His Pro Lys Cys Asp Phe Arg Pro
325 330 335

Glu Thr Ile Asn Asn Gly Leu Trp Phe Asn Ser Leu Ser Val Ser Leu
340 345 350

Ala Tyr Gly Pro Leu Gln Gly Gly Cys Lys Gln Ser Val Phe Ser Asn
355 360 365

Arg Ala Thr Cys Cys Tyr Ala Tyr Ser Tyr Asn Gly Pro Arg Leu Cys
370 375 380

Lys Gly Val Tyr Ile Gly Glu Leu Gln Gln Tyr Phe Glu Cys Gly Leu
385 390 395 400

Leu Val Tyr Val Thr Lys Ser Asp Gly Ser Arg Ile Gln Thr Arg Asn
405 410 415

Glu Pro Leu Val Leu Thr His His Asn Tyr Asn Asn Ile Thr Leu Asp
420 425 430

Arg Cys Val Glu Tyr Asn Ile Tyr Gly Arg Ser Gly Gln Gly Phe Ile
435 440 445

Thr Asn Val Thr Ala Ala Ala Ala Asn Tyr Asn Tyr Leu Ala Asp Gly
450 455 460

Gly Leu Ala Ile Leu Asp Thr Ser Gly Ala Ile Asp Ile Phe Val Val
465 470 475 480

Gln Gly Glu Tyr Gly Pro Asn Tyr Tyr Lys Val Asn Pro Cys Glu Asp
485 490 495

Val Asn Gln Gln Phe Val Val Ser Gly Gly Gly Ile Val Gly Val Leu
500 505 510

Thr Ser His Asn Glu Thr Gly Ser Gln Gln Leu Glu Asn Leu Phe Tyr
515 520 525

Val Lys Leu Thr Asn Ser Thr Arg Arg Thr Arg Arg Ser Thr Ile Ala
530 535 540

Asn Val Thr Thr Cys Pro Tyr Val Ser Tyr Gly Arg Phe Cys Ile Lys
545 550 555 560

Pro Asp Gly Leu Val Ser Glu Ile Val Pro Gln Glu Leu Asp Tyr Phe
565 570 575

Val Ala Pro Leu Leu Asn Val Thr Glu His Val Leu Ile Pro Asn Ser
580 585 590

Phe Asn Leu Thr Val Thr Asp Glu Tyr Ile Gln Thr Arg Met Glu Lys
595 600 605

Val Gln Ile Asn Cys Leu Gln Tyr Val Cys Gly Asn Ser Ile Glu Cys
610 615 620

Arg Asn Leu Phe Gln Gln Tyr Gly Pro Val Cys Asp Asn Ile Leu Ser
625 630 635 640

Ile Val Asn Ser Val Gly Gln Arg Glu Asp Met Glu Ser Leu Thr Phe
645 650 655

Tyr Ser Ser Thr Lys Pro Lys Gly Tyr Asn Thr Pro Ile Phe Ser Asn
660 665 670

Ile Ser Thr Gly Asp Phe Asn Ile Ser Leu Met Leu Thr Pro Pro Ser
675 680 685

Ser Pro Ser Gly Arg Ser Phe Ile Glu Asp Leu Leu Phe Thr Ser Val
690 695 700

Glu Thr Val Gly Leu Pro Thr Asp Ala Glu Tyr Lys Lys Cys Thr Ala
705 710 715 720

Gly Pro Leu Gly Thr Leu Lys Asp Leu Ile Cys Ala Arg Glu Tyr Asn
725 730 735

Gly Leu Leu Val Leu Pro Pro Ile Ile Thr Ala Asp Met Gln Thr Met
740 745 750

Tyr Thr Ala Ser Leu Val Gly Ala Met Ala Phe Gly Gly Ile Thr Ser
755 760 765

Ala Ala Ala Ile Pro Phe Ala Thr Gln Ile Gln Ala Arg Ile Asn His
770 775 780

Leu Gly Ile Thr Gln Ser Leu Leu Met Lys Asn Gln Glu Lys Ile Ala
785 790 795 800

Ala Ser Phe Asn Lys Ala Ile Gly His Met Gln Glu Gly Phe Arg Ser
805 810 815

Thr Ser Leu Ala Leu Gln Gln Ile Gln Asp Val Val Asn Lys Gln Ser
820 825 830

Ala Ile Leu Thr Glu Thr Met Asn Ser Leu Asn Lys Asn Phe Gly Ala
835 840 845

Ile Thr Ser Val Ile Gln Asp Ile Tyr Ala Gln Leu Asp Ala Ile Gln
850 855 860

Ala Asp Ala Gln Val Asp Arg Leu Ile Thr Gly Arg Leu Ser Ser Leu
865 870 875 880

Ser Val Leu Ala Ser Ala Lys Gln Ser Glu Tyr Ile Arg Val Ser Gln
885 890 895

Gln Arg Glu Leu Ala Thr Gln Lys Ile Asn Glu Cys Val Lys Ser Gln
900 905 910

Ser Asn Arg Tyr Gly Phe Cys Gly Ser Gly Arg His Val Leu Ser Ile
915 920 925

Pro Gln Asn Ala Pro Asn Gly Ile Val Phe Ile His Phe Thr Tyr Thr
930 935 940

Pro Glu Ser Phe Val Asn Val Thr Ala Ile Val Gly Phe Cys Val Ser
945 950 955 960

Pro Ala Asn Ala Ser Gln Tyr Ala Ile Val Pro Ala Asn Gly Arg Gly
965 970 975

Ile Phe Ile Gln Val Asn Gly Thr Tyr Tyr Ile Thr Ala Arg Asp Met
980 985 990

Tyr Met Pro Arg Asp Ile Thr Ala Gly Asp Ile Val Thr Leu Thr Ser
995 1000 1005

Cys Gln Ala Asn Tyr Val Asn Val Asn Lys Thr Val Ile Thr Thr
1010 1015 1020

Phe Val Glu Asp Asp Asp Phe Asp Phe Asp Asp Glu Leu Ser Lys
1025 1030 1035

Trp Trp Asn Glu Thr Lys His Glu Ile Pro Asp Phe Asp Glu Phe
1040 1045 1050

Asn Tyr Thr Val Pro Ile Leu Asn Ile Ser Ser Glu Ile Asp Arg
1055 1060 1065

Ile Gln Gly Val Ile Gln Gly Leu Asn Asp Ser Leu Ile Asn Leu
1070 1075 1080

Glu Glu Leu Ser Ile Ile Lys Thr Tyr Ile Lys Trp Pro Trp Tyr
1085 1090 1095

Val Trp Leu Ala Ile Gly Phe Ala Ile Ile Ile Phe Ile Leu Ile
1100 1105 1110

Leu Gly Trp Val Phe Phe Met Thr Gly Cys Cys Gly Cys Cys Cys
1115 1120 1125

Gly Cys Phe Gly Ile Ile Pro Leu Met Ser Lys Cys Gly Lys Lys
1130 1135 1140

Ser Ser Tyr Tyr Thr Thr Phe Asp Asn Asp Val Val Thr
1145 1150 1155

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<400> 7

Met Leu Val Gln Pro Leu Leu Leu Val Thr Leu Leu Cys Ala Leu Cys
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Ser Ala Ser Leu Tyr Asn Asn Asp Ser Tyr Val Tyr Tyr Tyr Gln Ser
20 25 30

Ala Phe Arg Pro Phe Asn Gly Trp His Leu His Gly Gly Ala Tyr Ala
35 40 45

Val Val Asn Val Ser Gln Glu Thr Ala Asn Ala Gly Ser Ser Pro Ser
50 55 60

Cys Thr Ala Gly Ala Ile Tyr Trp Ser Lys Asn Phe Thr Ala Ser Ser
65 70 75 80

Val Ala Met Thr Ala Pro Leu Gln Gly Met Gln Trp Ser Thr Ile Gln
85 90 95

Phe Cys Thr Ala His Cys Asn Phe Thr Asn Ile Val Val Phe Val Thr
100 105 110

His Cys Tyr Lys Ser Gly Ser Thr Val Cys Pro Leu Thr Gly Leu Ile
115 120 125

Pro Gln Asn His Ile Arg Ile Ser Ala Met Lys Gln Gly Asn Asn Gly
130 135 140

Pro Ser Gly Leu Phe Tyr Asn Leu Thr Val Pro Val Thr Lys Tyr Ser
145 150 155 160

Lys Phe Lys Ser Leu Gln Cys Val Asn Asn Gln Thr Ser Val Tyr Leu
165 170 175

Asn Gly Asp Leu Val Phe Thr Ser Asn Glu Thr Lys Asp Val Ser Gly
180 185 190

Ala Gly Val Tyr Phe Lys Ala Gly Gly Pro Ile Thr Tyr Lys Val Met
195 200 205

Arg Glu Val Lys Ala Leu Ala Tyr Phe Val Asn Gly Thr Ala His Asp
210 215 220

Val Ile Leu Cys Asp Gly Ser Pro Arg Gly Leu Leu Ala Cys Gln Tyr
225 230 235 240

Asn Thr Gly Lys Phe Ser Asp Gly Phe Tyr Pro Phe Thr Asn Asp Thr
245 250 255

Leu Val Lys Glu Lys Phe Ile Val Tyr Arg Glu Asn Ser Val Asn Thr
260 265 270

Thr Cys Thr Leu Thr Asn Phe Thr Phe Tyr Asn Glu Ser Asn Ala Leu

	275					280					285				
Pro	Asn	Asn	Gly	Gly	Val	Asp	Thr	Ile	Gln	Leu	Tyr	Gln	Thr	His	Thr
	290					295					300				
Ala	Gln	Ser	Gly	Tyr	Tyr	Asn	Phe	Asn	Phe	Ser	Phe	Leu	Ser	Ser	Phe
305					310					315					320
Gln	Tyr	Val	Glu	Ser	Asn	Phe	Met	Tyr	Gly	Ser	Tyr	His	Pro	Lys	Cys
				325					330					335	
Gly	Phe	Arg	Pro	Glu	Ser	Ile	Asn	Asn	Gly	Leu	Trp	Phe	Asn	Ser	Leu
			340					345					350		
Ser	Val	Ser	Leu	Ala	Tyr	Gly	Pro	Leu	Gln	Gly	Gly	Cys	Lys	Gln	Ser
		355					360					365			
Val	Phe	His	Gly	Arg	Ala	Thr	Cys	Cys	Tyr	Ala	Tyr	Ser	Tyr	Asn	Gly
	370					375					380				
Pro	Thr	Leu	Cys	Lys	Gly	Val	Tyr	Ser	Gly	Glu	Leu	Thr	Arg	Ser	Tyr
385					390					395					400
Gln	Cys	Gly	Leu	Leu	Val	Phe	Val	Thr	Lys	Ser	Asp	Gly	Ser	Arg	Ile
				405					410					415	
Gln	Thr	Ser	Thr	Lys	Pro	Ile	Val	Leu	Thr	Gln	His	Asn	Tyr	Asn	Asn
			420					425					430		
Ile	Thr	Leu	Asp	Arg	Cys	Val	Glu	Tyr	Asn	Ile	Tyr	Gly	Arg	Val	Gly
		435					440					445			
Gln	Gly	Phe	Ile	Thr	Asn	Val	Thr	Glu	Ser	Ala	Ala	Ala	Phe	Asn	Tyr
	450					455					460				
Leu	Glu	Asp	Gly	Gly	Leu	Ala	Ile	Leu	Asp	Thr	Ser	Gly	Ala	Ile	Asp
465					470					475					480
Ile	Phe	Val	Val	Gln	Gly	Glu	Tyr	Gly	Phe	Asn	Tyr	Tyr	Lys	Val	Asn
				485					490					495	

Pro Cys Glu Asp Val Asn Gln Gln Phe Val Val Ser Gly Gly Asn Leu
500 505 510

Val Gly Ile Leu Thr Ser Ile Asn Gln Thr Gly Ser Gln Ser Ile Glu
515 520 525

Asn Gln Phe Tyr Val Lys Leu Thr Asn Gly Ser Arg Arg Ser Arg Arg
530 535 540

Ser Val Ser Glu Asn Val Thr Ser Cys Pro Tyr Val Ser Tyr Gly Lys
545 550 555 560

Phe Cys Ile Lys Pro Asp Gly Ser Leu Ser Thr Ile Val Pro Lys Glu
565 570 575

Leu Glu Gln Phe Val Ala Pro Leu Leu Asn Val Thr Glu His Val Leu
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Ile Pro Asp Ser Phe Asn Leu Thr Val Thr Asp Glu Tyr Ile Gln Thr
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Cys Val Lys Pro Ala Asn Ala Ser Gln Tyr Ala Ile Val Pro Ala Asn
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Pro Gly His Leu Phe Tyr Asn Leu Thr Val Ser Val Thr Lys Tyr Pro
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Lys Phe Arg Ser Leu Gln Cys Val Asn Asn Tyr Thr Ser Val Tyr Leu
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Asn Gly Asp Leu Val Phe Thr Ser Asn Tyr Thr Glu Asp Val Val Ala
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Ala Gly Val His Phe Lys Ser Gly Gly Pro Ile Thr Tyr Lys Val Met

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