

SEQUENCE LISTING

<110> Boehringer Ingelheim International GmbH
ViraTherapeutics GmbH

<120> Recombinant rhabdovirus encoding for CCL21

<130> 01-3349-W0

<150> EP19153668.9

<151> 2019-01-25

<160> 24

<170> BiSSAP 1.3.6

<210> 1

<211> 134

<212> PRT

<213> Homo sapiens

<400> 1

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

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<210> 2

<211> 111

<212> PRT

<213> Homo sapiens

<400> 2

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

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<400> 5

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

<210> 6

<211> 19

<212> PRT

<213> Mus musculus

<400> 6

Met	Gly	Trp	Ser	Cys	Ile	Ile	Leu	Phe	Leu	Val	Ala	Thr	Ala	Thr	Gly
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Val	His	Ser													

<210> 7

<211> 422

<212> PRT

<213> Vesicular stomatitis virus

<400> 7

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

145					150					155				160
Thr	Asn	Gln	Cys	Lys	Met	Ile	Asn	Glu	Gln	Phe	Glu	Pro	Leu	Val
				165					170					175
Glu	Gly	Arg	Asp	Ile	Phe	Asp	Val	Trp	Gly	Asn	Asp	Ser	Asn	Tyr
			180					185					190	
Lys	Ile	Val	Ala	Ala	Val	Asp	Met	Phe	Phe	His	Met	Phe	Lys	Lys
		195					200					205		
Glu	Cys	Ala	Ser	Phe	Arg	Tyr	Gly	Thr	Ile	Val	Ser	Arg	Phe	Lys
	210					215					220			
Cys	Ala	Ala	Leu	Ala	Thr	Phe	Gly	His	Leu	Cys	Lys	Ile	Thr	Gly
225					230					235				240
Ser	Thr	Glu	Asp	Val	Thr	Thr	Trp	Ile	Leu	Asn	Arg	Glu	Val	Ala
			245						250					255
Glu	Met	Val	Gln	Met	Met	Leu	Pro	Gly	Gln	Glu	Ile	Asp	Lys	Ala
			260					265					270	
Ser	Tyr	Met	Pro	Tyr	Leu	Ile	Asp	Phe	Gly	Leu	Ser	Ser	Lys	Ser
	275						280					285		
Tyr	Ser	Ser	Val	Lys	Asn	Pro	Ala	Phe	His	Phe	Trp	Gly	Gln	Leu
	290				295						300			
Ala	Leu	Leu	Leu	Arg	Ser	Thr	Arg	Ala	Arg	Asn	Ala	Arg	Gln	Pro
305				310						315				320
Asp	Ile	Glu	Tyr	Thr	Ser	Leu	Thr	Thr	Ala	Gly	Leu	Leu	Tyr	Ala
				325					330					335
Ala	Val	Gly	Ser	Ser	Ala	Asp	Leu	Ala	Gln	Gln	Phe	Cys	Val	Gly
			340				345					350		
Asn	Lys	Tyr	Thr	Pro	Asp	Asp	Ser	Thr	Gly	Gly	Leu	Thr	Thr	Asn
	355					360						365		
Pro	Pro	Gln	Gly	Arg	Asp	Val	Val	Glu	Trp	Leu	Gly	Trp	Phe	Glu
	370				375						380			
Gln	Asn	Arg	Lys	Pro	Thr	Pro	Asp	Met	Met	Gln	Tyr	Ala	Lys	Arg
385				390						395				400
Val	Met	Ser	Leu	Gln	Gly	Leu	Arg	Glu	Lys	Thr	Ile	Gly	Lys	Tyr
			405					410						415
Lys	Ser	Glu	Phe	Asp	Lys									
			420											

<210> 8

<211> 265

<212> PRT

<213> Vesicular stomatitis virus

<400> 8

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

			180				185				190				
Ser	Ser	His	Gly	Thr	Asn	Ile	Cys	Arg	Ile	Arg	Val	Pro	Ser	Leu	Gly
		195					200				205				
Pro	Thr	Phe	Ile	Ser	Glu	Gly	Trp	Ala	Tyr	Phe	Lys	Lys	Leu	Asp	Ile
	210					215					220				
Leu	Met	Asp	Arg	Asn	Phe	Leu	Leu	Met	Val	Lys	Asp	Val	Ile	Ile	Gly
225					230					235					240
Arg	Met	Gln	Thr	Val	Leu	Ser	Met	Val	Cys	Arg	Ile	Asp	Asn	Leu	Phe
				245					250					255	
Ser	Glu	Gln	Asp	Ile	Phe	Ser	Leu	Leu	Asn	Ile	Tyr	Arg	Ile	Gly	Asp
			260					265					270		
Lys	Ile	Val	Glu	Arg	Gln	Gly	Asn	Phe	Ser	Tyr	Asp	Leu	Ile	Lys	Met
		275					280					285			
Val	Glu	Pro	Ile	Cys	Asn	Leu	Lys	Leu	Met	Lys	Leu	Ala	Arg	Glu	Ser
	290					295					300				
Arg	Pro	Leu	Val	Pro	Gln	Phe	Pro	His	Phe	Glu	Asn	His	Ile	Lys	Thr
305					310					315					320
Ser	Val	Asp	Glu	Gly	Ala	Lys	Ile	Asp	Arg	Gly	Ile	Arg	Phe	Leu	His
				325					330					335	
Asp	Gln	Ile	Met	Ser	Val	Lys	Thr	Val	Asp	Leu	Thr	Leu	Val	Ile	Tyr
			340					345					350		
Gly	Ser	Phe	Arg	His	Trp	Gly	His	Pro	Phe	Ile	Asp	Tyr	Tyr	Thr	Gly
		355					360					365			
Leu	Glu	Lys	Leu	His	Ser	Gln	Val	Thr	Met	Lys	Lys	Asp	Ile	Asp	Val
	370					375					380				
Ser	Tyr	Ala	Lys	Ala	Leu	Ala	Ser	Asp	Leu	Ala	Arg	Ile	Val	Leu	Phe
385					390					395					400
Gln	Gln	Phe	Asn	Asp	His	Lys	Lys	Trp	Phe	Val	Asn	Gly	Asp	Leu	Leu
			405						410					415	
Pro	His	Asp	His	Pro	Phe	Lys	Ser	His	Val	Lys	Glu	Asn	Thr	Trp	Pro
			420					425					430		
Thr	Ala	Ala	Gln	Val	Gln	Asp	Phe	Gly	Asp	Lys	Trp	His	Glu	Leu	Pro
		435					440					445			
Leu	Ile	Lys	Cys	Phe	Glu	Ile	Pro	Asp	Leu	Leu	Asp	Pro	Ser	Ile	Ile
	450					455					460				
Tyr	Ser	Asp	Lys	Ser	His	Ser	Met	Asn	Arg	Ser	Glu	Val	Leu	Lys	His
465					470					475					480
Val	Arg	Met	Asn	Pro	Asn	Thr	Pro	Ile	Pro	Ser	Lys	Lys	Val	Leu	Gln
			485						490					495	
Thr	Met	Leu	Asp	Thr	Lys	Ala	Thr	Asn	Trp	Lys	Glu	Phe	Leu	Lys	Glu
			500					505					510		
Ile	Asp	Glu	Lys	Gly	Leu	Asp	Asp	Asp	Asp	Leu	Ile	Ile	Gly	Leu	Lys
		515					520					525			
Gly	Lys	Glu	Arg	Glu	Leu	Lys	Leu	Ala	Gly	Arg	Phe	Phe	Ser	Leu	Met
	530		</												

610		615		620
Met Gly Gln Phe Leu	Gly Tyr Pro Ser Leu	Ile Glu Arg Thr His Glu		
625	630	635		640
Phe Phe Glu Lys Ser	Leu Ile Tyr Tyr Asn	Gly Arg Pro Asp Leu Met		
	645	650		655
Arg Val His Asn Asn	Thr Leu Ile Asn Ser	Thr Ser Gln Arg Val Cys		
	660	665		670
Trp Gln Gly Gln Glu	Gly Gly Leu Glu Gly	Leu Arg Gln Lys Gly Trp		
	675	680		685
Ser Ile Leu Asn Leu	Leu Val Ile Gln Arg	Glu Ala Lys Ile Arg Asn		
	690	695		700
Thr Ala Val Lys Val	Leu Ala Gln Gly Asp	Asn Gln Val Ile Cys Thr		
705	710	715		720
Gln Tyr Lys Thr Lys	Lys Ser Arg Asn Val	Val Glu Leu Gln Gly Ala		
	725	730		735
Leu Asn Gln Met Val	Ser Asn Asn Glu Lys	Ile Met Thr Ala Ile Lys		
	740	745		750
Ile Gly Thr Gly Lys	Leu Gly Leu Leu Ile	Asn Asp Asp Glu Thr Met		
	755	760		765
Gln Ser Ala Asp Tyr	Leu Asn Tyr Gly Lys	Ile Pro Ile Phe Arg Gly		
	770	775		780
Val Ile Arg Gly Leu	Glu Thr Lys Arg Trp	Ser Arg Val Thr Cys Val		
785	790	795		800
Thr Asn Asp Gln Ile	Pro Thr Cys Ala Asn	Ile Met Ser Ser Val Ser		
	805	810		815
Thr Asn Ala Leu Thr	Val Ala His Phe Ala	Glu Asn Pro Ile Asn Ala		
	820	825		830
Met Ile Gln Tyr Asn	Tyr Phe Gly Thr Phe	Ala Arg Leu Leu Leu Met		
	835	840		845
Met His Asp Pro Ala	Leu Arg Gln Ser Leu	Tyr Glu Val Gln Asp Lys		
	850	855		860
Ile Pro Gly Leu His	Ser Ser Thr Phe Lys	Tyr Ala Met Leu Tyr Leu		
865	870	875		880
Asp Pro Ser Ile Gly	Gly Val Ser Gly Met	Ser Leu Ser Arg Phe Leu		
	885	890		895
Ile Arg Ala Phe Pro	Asp Pro Val Thr Glu	Ser Leu Ser Phe Trp Arg		
	900	905		910
Phe Ile His Val His	Ala Arg Ser Glu His	Leu Lys Glu Met Ser Ala		
	915	920		925
Val Phe Gly Asn Pro	Glu Ile Ala Lys Phe	Arg Ile Thr His Ile Asp		
	930	935		940
Lys Leu Val Glu Asp	Pro Thr Ser Leu Asn	Ile Ala Met Gly Met Ser		
945	950	955		960
Pro Ala Asn Leu Leu	Lys Thr Glu Val Lys	Lys Cys Leu Ile Glu Ser		
	965	970		975
Arg Gln Thr Ile Arg	Asn Gln Val Ile Lys	Asp Ala Thr Ile Tyr Leu		
	980	985		990
Tyr His Glu Glu Asp	Arg Leu Arg Ser Phe	Leu Trp Ser Ile Asn Pro		
	995	1000		1005
Leu Phe Pro Arg Phe	Leu Ser Glu Phe Lys	Ser Gly Thr Phe Leu Gly		
	1010	1015		1020
Val Ala Asp Gly Leu	Ile Ser Leu Phe Gln	Asn Ser Arg Thr Ile Arg		
1025	1030	1035		1040
Asn Ser Phe Lys Lys	Lys Tyr His Arg Glu	Leu Asp Asp Leu Ile Val		

1045										1050					1055				
Arg	Ser	Glu	Val	Ser	Ser	Leu	Thr	His	Leu	Gly	Lys	Leu	His	Leu	Arg				
1060										1065					1070				
Arg	Gly	Ser	Cys	Lys	Met	Trp	Thr	Cys	Ser	Ala	Thr	His	Ala	Asp	Thr				
1075										1080					1085				
Leu	Arg	Tyr	Lys	Ser	Trp	Gly	Arg	Thr	Val	Ile	Gly	Thr	Thr	Val	Pro				
1090										1095					1100				
His	Pro	Leu	Glu	Met	Leu	Gly	Pro	Gln	His	Arg	Lys	Glu	Thr	Pro	Cys				
1105										1110					1115				
Ala	Pro	Cys	Asn	Thr	Ser	Gly	Phe	Asn	Tyr	Val	Ser	Val	His	Cys	Pro				
1125										1130					1135				
Asp	Gly	Ile	His	Asp	Val	Phe	Ser	Ser	Arg	Gly	Pro	Leu	Pro	Ala	Tyr				
1140										1145					1150				
Leu	Gly	Ser	Lys	Thr	Ser	Glu	Ser	Thr	Ser	Ile	Leu	Gln	Pro	Trp	Glu				
1155										1160					1165				
Arg	Glu	Ser	Lys	Val	Pro	Leu	Ile	Lys	Arg	Ala	Thr	Arg	Leu	Arg	Asp				
1170										1175					1180				
Ala	Ile	Ser	Trp	Phe	Val	Glu	Pro	Asp	Ser	Lys	Leu	Ala	Met	Thr	Ile				
1185										1190					1195				
Leu	Ser	Asn	Ile	His	Ser	Leu	Thr	Gly	Glu	Glu	Trp	Thr	Lys	Arg	Gln				
1205										1210					1215				
His	Gly	Phe	Lys	Arg	Thr	Gly	Ser	Ala	Leu	His	Arg	Phe	Ser	Thr	Ser				
1220										1225					1230				
Arg	Met	Ser	His	Gly	Gly	Phe	Ala	Ser	Gln	Ser	Thr	Ala	Ala	Leu	Thr				
1235										1240					1245				
Arg	Leu	Met	Ala	Thr	Thr	Asp	Thr	Met	Arg	Asp	Leu	Gly	Asp	Gln	Asn				
1250										1255					1260				
Phe	Asp	Phe	Leu	Phe	Gln	Ala	Thr	Leu	Leu	Tyr	Ala	Gln	Ile	Thr	Thr				
1265										1270					1275				
Thr	Val	Ala	Arg	Asp	Gly	Trp	Ile	Thr	Ser	Cys	Thr	Asp	His	Tyr	His				
1285										1290					1295				
Ile	Ala	Cys	Lys	Ser	Cys	Leu	Arg	Pro	Ile	Glu	Glu	Ile	Thr	Leu	Asp				
1300										1305					1310				
Ser	Ser	Met	Asp	Tyr	Thr	Pro	Pro	Asp	Val	Ser	His	Val	Leu	Lys	Thr				
1315										1320					1325				
Trp	Arg	Asn	Gly	Glu	Gly	Ser	Trp	Gly	Gln	Glu	Ile	Lys	Gln	Ile	Tyr				
1330										1335					1340				
Pro	Leu	Glu	Gly	Asn	Trp	Lys	Asn	Leu	Ala	Pro	Ala	Glu	Gln	Ser	Tyr				
1345										1350					1355				
Gln	Val	Gly	Arg	Cys	Ile	Gly	Phe	Leu	Tyr	Gly	Asp	Leu	Ala	Tyr	Arg				
1365										1370					1375				
Lys	Ser	Thr	His	Ala	Glu	Asp	Ser	Ser	Leu	Phe	Pro	Leu	Ser	Ile	Gln				
1380										1385					1390				
Gly	Arg	Ile	Arg	Gly	Arg	Gly	Phe	Leu	Lys	Gly	Leu	Leu	Asp	Gly	Leu				
1395										1400					1405				
Met	Arg	Ala	Ser	Cys	Cys	Gln	Val	Ile	His	Arg	Arg	Ser	Leu	Ala	His				
1410										1415					1420				
Leu	Lys	Arg	Pro	Ala	Asn	Ala	Val	Tyr	Gly	Gly	Leu	Ile	Tyr	Leu	Ile				
1425										1430					1435				
Asp	Lys	Leu	Ser	Val	Ser	Pro	Pro	Phe	Leu	Ser	Leu	Thr	Arg	Ser	Gly				
1445										1450					1455				
Pro	Ile	Arg	Asp	Glu	Leu	Glu	Thr	Ile	Pro	His	Lys	Ile	Pro	Thr	Ser				
1460										1465					1470				
Tyr	Pro	Thr	Ser	Asn	Arg	Asp	Met	Gly	Val	Ile	Val	Arg	Asn	Tyr	Phe				

1475					1480					1485					
Lys	Tyr	Gln	Cys	Arg	Leu	Ile	Glu	Lys	Gly	Lys	Tyr	Arg	Ser	His	Tyr
1490					1495					1500					
Ser	Gln	Leu	Trp	Leu	Phe	Ser	Asp	Val	Leu	Ser	Ile	Asp	Phe	Ile	Gly
1505					1510					1515					
Pro	Phe	Ser	Ile	Ser	Thr	Thr	Leu	Leu	Gln	Ile	Leu	Tyr	Lys	Pro	Phe
1525					1530					1535					
Leu	Ser	Gly	Lys	Asp	Lys	Asn	Glu	Leu	Arg	Glu	Leu	Ala	Asn	Leu	Ser
1540					1545					1550					
Ser	Leu	Leu	Arg	Ser	Gly	Glu	Gly	Trp	Glu	Asp	Ile	His	Val	Lys	Phe
1555					1560					1565					
Phe	Thr	Lys	Asp	Ile	Leu	Leu	Cys	Pro	Glu	Glu	Ile	Arg	His	Ala	Cys
1570					1575					1580					
Lys	Phe	Gly	Ile	Ala	Lys	Asp	Asn	Asn	Lys	Asp	Met	Ser	Tyr	Pro	Pro
1585					1590					1595					
Trp	Gly	Arg	Glu	Ser	Arg	Gly	Thr	Ile	Thr	Thr	Ile	Pro	Val	Tyr	Tyr
1605					1610					1615					
Thr	Thr	Thr	Pro	Tyr	Pro	Lys	Met	Leu	Glu	Met	Pro	Pro	Arg	Ile	Gln
1620					1625					1630					
Asn	Pro	Leu	Leu	Ser	Gly	Ile	Arg	Leu	Gly	Gln	Leu	Pro	Thr	Gly	Ala
1635					1640					1645					
His	Tyr	Lys	Ile	Arg	Ser	Ile	Leu	His	Gly	Met	Gly	Ile	His	Tyr	Arg
1650					1655					1660					
Asp	Phe	Leu	Ser	Cys	Gly	Asp	Gly	Ser	Gly	Gly	Met	Thr	Ala	Ala	Leu
1665					1670					1675					
Leu	Arg	Glu	Asn	Val	His	Ser	Arg	Gly	Ile	Phe	Asn	Ser	Leu	Leu	Glu
1685					1690					1695					
Leu	Ser	Gly	Ser	Val	Met	Arg	Gly	Ala	Ser	Pro	Glu	Pro	Pro	Ser	Ala
1700					1705					1710					
Leu	Glu	Thr	Leu	Gly	Gly	Asp	Lys	Ser	Arg	Cys	Val	Asn	Gly	Glu	Thr
1715					1720					1725					
Cys	Trp	Glu	Tyr	Pro	Ser	Asp	Leu	Cys	Asp	Pro	Arg	Thr	Trp	Asp	Tyr
1730					1735					1740					
Phe	Leu	Arg	Leu	Lys	Ala	Gly	Leu	Gly	Leu	Gln	Ile	Asp	Leu	Ile	Val
1745					1750					1755					
Met	Asp	Met	Glu	Val	Arg	Asp	Ser	Ser	Thr	Ser	Leu	Lys	Ile	Glu	Thr
1765					1770					1775					
Asn	Val	Arg	Asn	Tyr	Val	His	Arg	Ile	Leu	Asp	Glu	Gln	Gly	Val	Leu
1780					1785					1790					
Ile	Tyr	Lys	Thr	Tyr	Gly	Thr	Tyr	Ile	Cys	Glu	Ser	Glu	Lys	Asn	Ala
1795					1800					1805					
Val	Thr	Ile	Leu	Gly	Pro	Met	Phe	Lys	Thr	Val	Asp	Leu	Val	Gln	Thr
1810					1815					1820					
Glu	Phe	Ser	Ser	Ser	Gln	Thr	Ser	Glu	Val	Tyr	Met	Val	Cys	Lys	Gly
1825					1830					1835					
Leu	Lys	Lys	Leu	Ile	Asp	Glu	Pro	Asn	Pro	Asp	Trp	Ser	Ser	Ile	Asn
1845					1850					1855					
Glu	Ser	Trp	Lys	Asn	Leu	Tyr	Ala	Phe	Gln	Ser	Ser	Glu	Gln	Glu	Phe
1860					1865					1870					
Ala	Arg	Ala	Lys	Lys	Val	Ser	Thr	Tyr	Phe	Thr	Leu	Thr	Gly	Ile	Pro
1875					1880					1885					
Ser	Gln	Phe	Ile	Pro	Asp	Pro	Phe	Val	Asn	Ile	Glu	Thr	Met	Leu	Gln
1890					1895					1900					
Ile	Phe	Gly	Val	Pro	Thr	Gly	Val	Ser	His	Ala	Ala	Ala	Leu	Lys	Ser

				165				170				175			
Ile	Tyr	Asp	Asp	Glu	Ser	Leu	Glu	Ala	Ala	Pro	Met	Ile	Trp	Asp	His
			180					185					190		
Phe	Asn	Ser	Ser	Lys	Phe	Ser	Asp	Phe	Arg	Glu	Lys	Ala	Leu	Met	Phe
		195					200					205			
Gly	Leu	Ile	Val	Glu	Lys	Lys	Ala	Ser	Gly	Ala	Trp	Val	Leu	Asp	Ser
	210					215					220				
Ile	Gly	His	Phe	Lys											
225															

<210> 11

<211> 498

<212> PRT

<213> Lymphocytic choriomeningitis mammarenavirus

<400> 11

Met	Gly	Gln	Ile	Val	Thr	Met	Phe	Glu	Ala	Leu	Pro	His	Ile	Ile	Asp
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Glu	Val	Ile	Asn	Ile	Val	Ile	Ile	Val	Leu	Ile	Ile	Ile	Thr	Ser	Ile
			20					25					30		
Lys	Ala	Val	Tyr	Asn	Phe	Ala	Thr	Cys	Gly	Ile	Leu	Ala	Leu	Val	Ser
		35				40						45			
Phe	Leu	Phe	Leu	Ala	Gly	Arg	Ser	Cys	Gly	Met	Tyr	Gly	Leu	Asn	Gly
	50					55					60				
Pro	Asp	Ile	Tyr	Lys	Gly	Val	Tyr	Gln	Phe	Lys	Ser	Val	Glu	Phe	Asp
65					70					75					80
Met	Ser	His	Leu	Asn	Leu	Thr	Met	Pro	Asn	Ala	Cys	Ser	Ala	Asn	Asn
				85					90					95	
Ser	His	His	Tyr	Ile	Ser	Met	Gly	Ser	Ser	Gly	Leu	Glu	Leu	Thr	Phe
			100					105					110		
Thr	Asn	Asp	Ser	Ile	Leu	Asn	His	Asn	Phe	Cys	Asn	Leu	Thr	Ser	Ala
		115					120					125			
Phe	Asn	Lys	Lys	Thr	Phe	Asp	His	Thr	Leu	Met	Ser	Ile	Val	Ser	Ser
		130				135					140				
Leu	His	Leu	Ser	Ile	Arg	Gly	Asn	Ser	Asn	His	Lys	Ala	Val	Ser	Cys
145					150					155					160
Asp	Phe	Asn	Asn	Gly	Ile	Thr	Ile	Gln	Tyr	Asn	Leu	Ser	Phe	Ser	Asp
				165					170					175	
Pro	Gln	Ser	Ala	Ile	Ser	Gln	Cys	Arg	Thr	Phe	Arg	Gly	Arg	Val	Leu
			180					185					190		
Asp	Met	Phe	Arg	Thr	Ala	Phe	Gly	Gly	Lys	Tyr	Met	Arg	Ser	Gly	Trp
		195					200					205			
Gly	Trp	Ala	Gly	Ser	Asp	Gly	Lys	Thr	Thr	Trp	Cys	Ser	Gln	Thr	Ser
	210					215					220				
Tyr	Gln	Tyr	Leu	Ile	Ile	Gln	Asn	Arg	Thr	Trp	Glu	Asn	His	Cys	Arg
225					230						235				240
Tyr	Ala	Gly	Pro	Phe	Gly	Met	Ser	Arg	Ile	Leu	Phe	Ala	Gln	Glu	Lys
				245					250					255	
Thr	Lys	Phe	Leu	Thr	Arg	Arg	Leu	Ala	Gly	Thr	Phe	Thr	Trp	Thr	Leu
			260					265					270		
Ser	Asp	Ser	Ser	Gly	Val	Glu	Asn	Pro	Gly	Gly	Tyr	Cys	Leu	Thr	Lys
		275					280					285			
Trp	Met	Ile	Leu	Ala	Ala	Glu	Leu	Lys	Cys	Phe	Gly	Asn	Thr	Ala	Val

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

<210> 12

<211> 498

<212> PRT

<213> Dandenong virus

<400> 12

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

145					150					155				160
Asp	Phe	Asn	Asn	Gly	Ile	Thr	Ile	Gln	Tyr	Asn	Leu	Ser	Phe	Ser
				165					170					175
Ala	Gln	Ser	Ala	Ile	Asn	Gln	Cys	Arg	Thr	Phe	Arg	Gly	Arg	Val
			180					185					190	
Asp	Met	Phe	Arg	Thr	Ala	Phe	Gly	Gly	Lys	Tyr	Met	Arg	Ser	Gly
		195					200					205		
Gly	Trp	Lys	Gly	Ser	Asp	Gly	Lys	Thr	Thr	Trp	Cys	Ser	Gln	Thr
	210					215					220			
Tyr	Gln	Tyr	Leu	Ile	Ile	Gln	Asn	Arg	Thr	Trp	Glu	Asn	His	Cys
225				230						235				240
Tyr	Ala	Gly	Pro	Phe	Gly	Leu	Ser	Arg	Val	Leu	Phe	Ala	Gln	Glu
			245						250					255
Thr	Lys	Phe	Leu	Thr	Arg	Arg	Leu	Ala	Gly	Thr	Phe	Thr	Trp	Thr
			260					265					270	
Ser	Asp	Ser	Ser	Gly	Thr	Glu	Asn	Pro	Gly	Gly	Tyr	Cys	Leu	Thr
	275						280					285		
Trp	Met	Leu	Ile	Ala	Ala	Glu	Leu	Lys	Cys	Phe	Gly	Asn	Thr	Ala
	290					295					300			
Ala	Lys	Cys	Asn	Ile	Asn	His	Asp	Glu	Glu	Phe	Cys	Asp	Met	Leu
305				310						315				320
Leu	Ile	Asp	Tyr	Asn	Lys	Ala	Ala	Leu	Lys	Lys	Phe	Lys	Glu	Asp
			325						330					335
Glu	Ser	Ala	Leu	His	Leu	Phe	Lys	Thr	Thr	Val	Asn	Ser	Leu	Ile
			340					345					350	
Asp	Gln	Leu	Leu	Met	Arg	Asn	His	Leu	Arg	Asp	Leu	Met	Gly	Val
	355						360					365		
Tyr	Cys	Asn	Tyr	Ser	Lys	Phe	Trp	Tyr	Leu	Glu	His	Val	Lys	Thr
	370					375					380			
Asp	Thr	Ser	Val	Pro	Lys	Cys	Trp	Leu	Val	Ser	Asn	Gly	Ser	Tyr
385				390						395				400
Asn	Glu	Thr	His	Phe	Ser	Asp	Gln	Ile	Glu	Gln	Glu	Ala	Asp	Asn
			405						410					415
Ile	Thr	Glu	Met	Leu	Arg	Lys	Asp	Tyr	Ile	Lys	Arg	Gln	Gly	Ser
		420						425					430	
Pro	Leu	Ala	Leu	Met	Asp	Leu	Leu	Met	Phe	Ser	Thr	Ser	Ala	Tyr
	435					440						445		
Ile	Ser	Val	Phe	Leu	His	Leu	Met	Lys	Ile	Pro	Thr	His	Arg	His
	450					455					460			
Lys	Gly	Gly	Thr	Cys	Pro	Lys	Pro	His	Arg	Leu	Thr	Ser	Lys	Gly
465				470					475					480
Cys	Ser	Cys	Gly	Ala	Phe	Lys	Val	Pro	Gly	Val	Lys	Thr	Val	Trp
			485						490					495

Arg Arg

<210> 13

<211> 489

<212> PRT

<213> Mopeia mammarenavirus

<400> 13

Met Gly Gln Ile Val Thr Phe Phe Gln Glu Val Pro His Ile Leu Glu

1				5				10				15			
Glu	Val	Met	Asn	Ile	Val	Leu	Met	Thr	Leu	Ser	Ile	Leu	Ala	Ile	Leu
			20					25					30		
Lys	Gly	Ile	Tyr	Asn	Val	Met	Thr	Cys	Gly	Ile	Ile	Gly	Leu	Ile	Thr
		35					40					45			
Phe	Leu	Phe	Leu	Cys	Gly	Arg	Ser	Cys	Ser	Ser	Ile	Tyr	Lys	Asp	Asn
	50					55					60				
Tyr	Glu	Phe	Phe	Ser	Leu	Asp	Leu	Asp	Met	Ser	Ser	Leu	Asn	Ala	Thr
65					70					75					80
Met	Pro	Leu	Ser	Cys	Ser	Lys	Asn	Asn	Ser	His	His	Tyr	Ile	Gln	Val
				85					90					95	
Gly	Asn	Glu	Thr	Gly	Leu	Glu	Leu	Thr	Leu	Thr	Asn	Thr	Ser	Ile	Ile
			100					105					110		
Asp	His	Lys	Phe	Cys	Asn	Leu	Ser	Asp	Ala	His	Arg	Arg	Asn	Leu	Tyr
		115					120					125			
Asp	Lys	Ala	Leu	Met	Ser	Ile	Leu	Thr	Thr	Phe	His	Leu	Ser	Ile	Pro
	130					135					140				
Asp	Phe	Asn	Gln	Tyr	Glu	Ala	Met	Ser	Cys	Asp	Phe	Asn	Gly	Gly	Lys
145					150					155					160
Ile	Ser	Ile	Gln	Tyr	Asn	Leu	Ser	His	Ser	Asn	Tyr	Val	Asp	Ala	Gly
			165						170					175	
Asn	His	Cys	Gly	Thr	Ile	Ala	Asn	Gly	Ile	Met	Asp	Val	Phe	Arg	Arg
		180						185					190		
Met	Tyr	Trp	Ser	Thr	Ser	Leu	Ser	Val	Ala	Ser	Asp	Ile	Ser	Gly	Thr
	195						200					205			
Gln	Cys	Ile	Gln	Thr	Asp	Tyr	Lys	Tyr	Leu	Ile	Ile	Gln	Asn	Thr	Ser
	210					215					220				
Trp	Glu	Asp	His	Cys	Met	Phe	Ser	Arg	Pro	Ser	Pro	Met	Gly	Phe	Leu
225					230					235					240
Ser	Leu	Leu	Ser	Gln	Arg	Thr	Arg	Asn	Phe	Tyr	Ile	Ser	Arg	Arg	Leu
			245						250					255	
Leu	Gly	Leu	Phe	Thr	Trp	Thr	Leu	Ser	Asp	Ser	Glu	Gly	Asn	Asp	Met
		260						265					270		
Pro	Gly	Gly	Tyr	Cys	Leu	Thr	Arg	Ser	Met	Leu	Ile	Gly	Leu	Asp	Leu
		275					280					285			
Lys	Cys	Phe	Gly	Asn	Thr	Ala	Ile	Ala	Lys	Cys	Asn	Gln	Ala	His	Asp
	290					295					300				
Glu	Glu	Phe	Cys	Asp	Met	Leu	Arg	Leu	Phe	Asp	Phe	Asn	Lys	Gln	Ala
305					310					315					320
Ile	Ser	Lys	Leu	Arg	Ser	Glu	Val	Gln	Gln	Ser	Ile	Asn	Leu	Ile	Asn
			325						330					335	
Lys	Ala	Val	Asn	Ala	Leu	Ile	Asn	Asp	Gln	Leu	Val	Met	Arg	Asn	His
		340						345					350		
Leu	Arg	Asp	Leu	Met	Gly	Ile	Pro	Tyr	Cys	Asn	Tyr	Ser	Lys	Phe	Trp
		355					360					365			
Tyr	Leu	Asn	Asp	Thr	Arg	Thr	Gly	Arg	Thr	Ser	Leu	Pro	Lys	Cys	Trp
	370					375					380				
Leu	Val	Thr	Asn	Gly	Ser	Tyr	Leu	Asn	Glu	Thr	Gln	Phe	Ser	Thr	Glu
385					390						395				400
Ile	Glu	Gln	Glu	Ala	Asn	Asn	Met	Phe	Thr	Asp	Met	Leu	Arg	Lys	Glu
			405						410					415	
Tyr	Glu	Lys	Arg	Gln	Ser	Thr	Thr	Pro	Leu	Gly	Leu	Val	Asp	Leu	Phe
			420					425					430		
Val	Phe	Ser	Thr	Ser	Phe	Tyr	Leu	Ile	Ser	Val	Phe	Leu	His	Leu	Ile

<210> 16
 <211> 446
 <212> PRT
 <213> Homo sapiens

<400> 16

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

370					375					380					
Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser
385					390					395					400
Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Arg	Leu	Thr	Val	Asp	Lys	Ser	Arg
				405					410					415	
Trp	Gln	Glu	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu
			420					425					430		
His	Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Leu	Gly		
		435					440					445			

<210> 17
 <211> 218
 <212> PRT
 <213> Homo sapiens

<400> 17															
Glu	Ile	Val	Leu	Thr	Gln	Ser	Pro	Ala	Thr	Leu	Ser	Leu	Ser	Pro	Gly
1			5					10					15		
Glu	Arg	Ala	Thr	Met	Ser	Cys	Arg	Ala	Ser	Glu	Asn	Ile	Asp	Thr	Ser
			20					25					30		
Gly	Ile	Ser	Phe	Met	Asn	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Gln	Ala	Pro
		35					40					45			
Lys	Leu	Leu	Ile	Tyr	Val	Ala	Ser	Asn	Gln	Gly	Ser	Gly	Ile	Pro	Ala
	50					55				60					
Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	Ser
65					70				75						80
Arg	Leu	Glu	Pro	Glu	Asp	Phe	Ala	Val	Tyr	Tyr	Cys	Gln	Gln	Ser	Lys
				85					90					95	
Glu	Val	Pro	Trp	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Leu	Glu	Ile	Lys	Arg
			100					105					110		
Thr	Val	Ala	Ala	Pro	Ser	Val	Phe	Ile	Phe	Pro	Pro	Ser	Asp	Glu	Gln
		115					120					125			
Leu	Lys	Ser	Gly	Thr	Ala	Ser	Val	Val	Cys	Leu	Leu	Asn	Asn	Phe	Tyr
	130					135					140				
Pro	Arg	Glu	Ala	Lys	Val	Gln	Trp	Lys	Val	Asp	Asn	Ala	Leu	Gln	Ser
145					150					155					160
Gly	Asn	Ser	Gln	Glu	Ser	Val	Thr	Glu	Gln	Asp	Ser	Lys	Asp	Ser	Thr
			165					170						175	
Tyr	Ser	Leu	Ser	Ser	Thr	Leu	Thr	Leu	Ser	Lys	Ala	Asp	Tyr	Glu	Lys
			180				185						190		
His	Lys	Val	Tyr	Ala	Cys	Glu	Val	Thr	His	Gln	Gly	Leu	Ser	Ser	Pro
		195					200					205			
Val	Thr	Lys	Ser	Phe	Asn	Arg	Gly	Glu	Cys						
		210				215									

<210> 18
 <211> 446
 <212> PRT
 <213> Homo sapiens

<400> 18															
Glu	Val	Met	Leu	Val	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly

1				5				10					15			
Ser	Leu	Arg	Leu	Ser	Cys	Thr	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Lys	Ser	
			20					25					30			
Ala	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val	
		35					40					45				
Ala	Tyr	Ile	Ser	Gly	Gly	Gly	Gly	Asp	Thr	Tyr	Tyr	Ser	Ser	Ser	Val	
	50				55						60					
Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ala	Lys	Asn	Ser	Leu	Tyr	
65				70					75					80		
Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys	
			85					90					95			
Ala	Arg	His	Ser	Asn	Val	Asn	Tyr	Tyr	Ala	Met	Asp	Tyr	Trp	Gly	Gln	
			100					105					110			
Gly	Thr	Leu	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly	Pro	Ser	Val	
	115						120					125				
Phe	Pro	Leu	Ala	Pro	Cys	Ser	Arg	Ser	Thr	Ser	Glu	Ser	Thr	Ala	Ala	
	130					135					140					
Leu	Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val	Thr	Val	Ser	
145					150					155					160	
Trp	Asn	Ser	Gly	Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala	Val	
			165					170						175		
Leu	Gln	Ser	Ser	Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val	Pro	
		180						185					190			
Ser	Ser	Ser	Leu	Gly	Thr	Lys	Thr	Tyr	Thr	Cys	Asn	Val	Asp	His	Lys	
	195					200					205					
Pro	Ser	Asn	Thr	Lys	Val	Asp	Lys	Arg	Val	Glu	Ser	Lys	Tyr	Gly	Pro	
	210					215				220						
Pro	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Phe	Leu	Gly	Gly	Pro	Ser	Val	
225				230					235						240	
Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	
			245					250						255		
Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	Gln	Glu	Asp	Pro	Glu	
		260						265					270			
Val	Gln	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	
	275						280					285				
Thr	Lys	Pro	Arg	Glu	Glu	Gln	Phe	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	
	290					295					300					
Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	
305				310						315					320	
Cys	Lys	Val	Ser	Asn	Lys	Gly	Leu	Pro	Ser	Ser	Ile	Glu	Lys	Thr	Ile	
			325					330					335			
Ser	Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	
		340						345					350			
Pro	Ser	Gln	Glu	Glu	Met	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	
	355						360					365				
Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	
	370				375						380					
Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	
385				390						395					400	
Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Arg	Leu	Thr	Val	Asp	Lys	Ser	Arg	
			405					410					415			
Trp	Gln	Glu	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu	
		420						425					430			
His	Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Leu	Gly			

435

440

445

<210> 19

<211> 218

<212> PRT

<213> Homo sapiens

<400> 19

Glu	Ile	Val	Leu	Thr	Gln	Ser	Pro	Ala	Thr	Leu	Ser	Leu	Ser	Pro	Gly
1				5					10					15	
Glu	Arg	Ala	Thr	Met	Ser	Cys	Arg	Ala	Ser	Glu	Asn	Ile	Asp	Val	Ser
			20					25					30		
Gly	Ile	Ser	Phe	Met	Asn	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Gln	Ala	Pro
		35					40					45			
Lys	Leu	Leu	Ile	Tyr	Val	Ala	Ser	Asn	Gln	Gly	Ser	Gly	Ile	Pro	Ala
	50					55					60				
Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	Ser
65					70				75					80	
Arg	Leu	Glu	Pro	Glu	Asp	Phe	Ala	Val	Tyr	Tyr	Cys	Gln	Gln	Ser	Lys
				85					90					95	
Glu	Val	Pro	Trp	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Leu	Glu	Ile	Lys	Arg
			100					105					110		
Thr	Val	Ala	Ala	Pro	Ser	Val	Phe	Ile	Phe	Pro	Pro	Ser	Asp	Glu	Gln
		115					120					125			
Leu	Lys	Ser	Gly	Thr	Ala	Ser	Val	Val	Cys	Leu	Leu	Asn	Asn	Phe	Tyr
	130					135				140					
Pro	Arg	Glu	Ala	Lys	Val	Gln	Trp	Lys	Val	Asp	Asn	Ala	Leu	Gln	Ser
145					150					155				160	
Gly	Asn	Ser	Gln	Glu	Ser	Val	Thr	Glu	Gln	Asp	Ser	Lys	Asp	Ser	Thr
			165					170						175	
Tyr	Ser	Leu	Ser	Ser	Thr	Leu	Thr	Leu	Ser	Lys	Ala	Asp	Tyr	Glu	Lys
		180					185						190		
His	Lys	Val	Tyr	Ala	Cys	Glu	Val	Thr	His	Gln	Gly	Leu	Ser	Ser	Pro
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Val	Thr	Lys	Ser	Phe	Asn	Arg	Gly	Glu	Cys						
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<210> 20

<211> 446

<212> PRT

<213> Homo sapiens

<400> 20

Glu	Val	Met	Leu	Val	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
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Ser	Leu	Arg	Leu	Ser	Cys	Thr	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Lys	Ser
			20					25					30		
Ala	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
		35					40					45			
Ala	Tyr	Ile	Ser	Gly	Gly	Gly	Gly	Asp	Thr	Tyr	Tyr	Ser	Ser	Ser	Val
	50					55					60				
Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ala	Lys	Asn	Ser	Leu	Tyr

65					70					75				80
Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr
				85					90					95
Ala	Arg	His	Ser	Asn	Val	Asn	Tyr	Tyr	Ala	Met	Asp	Tyr	Trp	Gln
			100					105					110	
Gly	Thr	Leu	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly	Pro	Ser
		115					120					125		Val
Phe	Pro	Leu	Ala	Pro	Cys	Ser	Arg	Ser	Thr	Ser	Glu	Ser	Thr	Ala
	130					135					140			Ala
Leu	Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val	Thr	Val
145					150					155				160
Trp	Asn	Ser	Gly	Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala
			165						170					175
Leu	Gln	Ser	Ser	Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val
			180					185					190	Pro
Ser	Ser	Ser	Leu	Gly	Thr	Lys	Thr	Tyr	Thr	Cys	Asn	Val	Asp	His
	195						200					205		Lys
Pro	Ser	Asn	Thr	Lys	Val	Asp	Lys	Arg	Val	Glu	Ser	Lys	Tyr	Gly
	210					215					220			Pro
Pro	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Phe	Leu	Gly	Gly	Pro	Ser
225				230						235				240
Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg
			245						250					255
Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	Gln	Glu	Asp	Pro
		260						265					270	Glu
Val	Gln	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala
	275						280					285		Lys
Thr	Lys	Pro	Arg	Glu	Glu	Gln	Phe	Asn	Ser	Thr	Tyr	Arg	Val	Val
	290					295					300			Ser
Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr
305				310						315				320
Cys	Lys	Val	Ser	Asn	Lys	Gly	Leu	Pro	Ser	Ser	Ile	Glu	Lys	Thr
				325				330						335
Ser	Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu
		340						345					350	Pro
Pro	Ser	Gln	Glu	Glu	Met	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys
	355						360					365		Leu
Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser
	370					375					380			Asn
Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp
385				390						395				400
Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Arg	Leu	Thr	Val	Asp	Lys	Ser
			405					410						415
Trp	Gln	Glu	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala
		420					425					430		Leu
His	Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Leu	Gly	
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<210> 21

<211> 218

<212> PRT

<213> Homo sapiens

<400> 21

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			20					25					30		
Gly	Ile	Ser	Phe	Met	Asn	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Gln	Ala	Pro
		35					40					45			
Lys	Leu	Leu	Ile	Tyr	Val	Ala	Ser	Asn	Gln	Gly	Ser	Gly	Ile	Pro	Ala
	50					55					60				
Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	Ser
65					70				75						80
Arg	Leu	Glu	Pro	Glu	Asp	Phe	Ala	Val	Tyr	Tyr	Cys	Gln	Gln	Ser	Lys
			85					90						95	
Glu	Val	Pro	Trp	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Leu	Glu	Ile	Lys	Arg
			100					105						110	
Thr	Val	Ala	Ala	Pro	Ser	Val	Phe	Ile	Phe	Pro	Pro	Ser	Asp	Glu	Gln
		115					120						125		
Leu	Lys	Ser	Gly	Thr	Ala	Ser	Val	Val	Cys	Leu	Leu	Asn	Asn	Phe	Tyr
	130					135						140			
Pro	Arg	Glu	Ala	Lys	Val	Gln	Trp	Lys	Val	Asp	Asn	Ala	Leu	Gln	Ser
145					150					155					160
Gly	Asn	Ser	Gln	Glu	Ser	Val	Thr	Glu	Gln	Asp	Ser	Lys	Asp	Ser	Thr
			165					170						175	
Tyr	Ser	Leu	Ser	Ser	Thr	Leu	Thr	Leu	Ser	Lys	Ala	Asp	Tyr	Glu	Lys
		180					185						190		
His	Lys	Val	Tyr	Ala	Cys	Glu	Val	Thr	His	Gln	Gly	Leu	Ser	Ser	Pro
		195				200						205			
Val	Thr	Lys	Ser	Phe	Asn	Arg	Gly	Glu	Cys						
	210					215									

<210> 22

<211> 446

<212> PRT

<213> Homo sapiens

<400> 22

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

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Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val					
	165		170		175
Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro					
	180		185		190
Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys					
	195	200		205	
Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro					
	210	215		220	
Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val					
225		230		235	240
Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr					
	245		250		255
Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu					
	260		265		270
Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys					
	275		280		285
Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser					
	290		295		300
Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys					
305		310		315	320
Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile					
	325		330		335
Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro					
	340		345		350
Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu					
	355		360		365
Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn					
	370		375		380
Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser					
385		390		395	400
Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg					
	405		410		415
Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu					
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His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly					
	435		440		445

<210> 23

<211> 218

<212> PRT

<213> Homo sapiens

<400> 23

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Gly Ile Ser Phe Met Asn Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro	
	35
Lys Leu Leu Ile Tyr Val Ala Ser Asn Gln Gly Ser Gly Ile Pro Ala	

50		55		60											
Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	Ser
65				70				75						80	
Arg	Leu	Glu	Pro	Glu	Asp	Phe	Ala	Val	Tyr	Tyr	Cys	Gln	Gln	Ser	Lys
				85				90						95	
Glu	Val	Pro	Trp	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Leu	Glu	Ile	Lys	Arg
				100				105						110	
Thr	Val	Ala	Ala	Pro	Ser	Val	Phe	Ile	Phe	Pro	Pro	Ser	Asp	Glu	Gln
				115				120						125	
Leu	Lys	Ser	Gly	Thr	Ala	Ser	Val	Val	Cys	Leu	Leu	Asn	Asn	Phe	Tyr
				130				135						140	
Pro	Arg	Glu	Ala	Lys	Val	Gln	Trp	Lys	Val	Asp	Asn	Ala	Leu	Gln	Ser
145								150						160	
Gly	Asn	Ser	Gln	Glu	Ser	Val	Thr	Glu	Gln	Asp	Ser	Lys	Asp	Ser	Thr
				165										175	
Tyr	Ser	Leu	Ser	Ser	Thr	Leu	Thr	Leu	Ser	Lys	Ala	Asp	Tyr	Glu	Lys
				180				185						190	
His	Lys	Val	Tyr	Ala	Cys	Glu	Val	Thr	His	Gln	Gly	Leu	Ser	Ser	Pro
				195				200						205	
Val	Thr	Lys	Ser	Phe	Asn	Arg	Gly	Glu	Cys						
				210				215							

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 <211> 11520
 <212> RNA
 <213> Vesicular stomatitis virus

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cguuuacucc uaggucaccu uaugggccgu cuaaugaagu cuuuuaguuu ccucuaagga	180
gaaauguagu uaugauguuu uucaaacagu cuagauucuc cuauacagau gguuccggag	240
uuuaggccuu uacauaguua guauguacag uugucgauga acauaccucg uaauuuccug	300
uaggcccca ucaaccuauu ucuaaccagu ucaaagccuu auuuguagcc cuuucguccc	360
cuauguuagc cuuauaaaacu ggaacauagg aacuuucggg accugccgca ugaaggucua	420
ccucauagcc uacgaagguc uuggucgcgu cuacuguuuu ccaacggaaa cauagaugaa	480
ccgaauaugu cucacccguc uuguguuuuac ggacuuaugu cuuuuuucga guaccuaccc	540
gacuguuuuag uuacguuuua cuaguuuacu gucaaaacuug gagaacacgg ucuuccagca	600
cuguaaaaaac uacacacccc uuucacuguca uuaauguguu uuuaacagcg acgucaccug	660
uacaagaagg uguacaagu uuuuguacu acacggagca agucuaugcc uugauaacia	720
aggucuaagu uucuaacacg acguaaccgu uguaaaaccug uggagacguu uuauuggccu	780

uacagauguc	uucuacauug	cuggaccuag	aacuuggcuc	uucaacgucu	acuuuaccag	840
guuuacuacg	aagguccggu	ucuuuaacug	uuccggcuaa	guauguacgg	aaauaacuag	900
cugaaaccua	acagaagauu	cagagguaua	agaaggcagu	uuuugggacg	gaaggugaag	960
acccccguua	acugucgaga	agacgagucu	agguggucuc	guuccuuacg	ggcugucgga	1020
cuacuguaac	ucauanguag	agaaugaugu	cguccaaaca	acaugcgaau	acgucauccu	1080
aggagacggc	ugaaccgugu	ugucaaaaca	caaccucuau	uguuuauug	aggucuacua	1140
ucauggccuc	cuaacugcug	auuacguggc	gguguuccgu	cucuacacca	gcuuaccgag	1200
ccuaccaaac	uucuaguuuu	gucuuuuggc	ugaggacuau	acuacgucan	acgcuuuucu	1260
cgucaguaca	gugacguucc	ggauucucuc	uucuguuaac	cguucauacg	auucagucuu	1320
aaacuguuua	cugggauauu	aagagucua	uggauaaau	auaaucgau	guauacuuuu	1380
uuugauuguc	uauaguaccu	auuagagugu	uuucaagcac	ucauagagu	caggauaaga	1440
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cgucgucua	uaagacugug	ucuuagacuu	ggucuuuaac	uucuguuagu	uccgaacaua	1620
cguggucua	gucuucgacu	cguucaacuu	ccgaaauaug	uccccggaaa	ucuacugaua	1680
cgucuacucc	uucaccuaca	acauaaauga	agccugaccu	uugucggacu	cgaacuuaga	1740
cugcucguac	cuuucuggaa	ugccaacugu	agcggucucc	caauuucacc	ucucgucuuu	1800
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cuacauauau	uccagugagg	ucacuacuug	uguguaggca	ggguuagucu	ucgucauagu	1980
cuacaaacca	gagagaguuu	cuguagguac	ugaaagguug	gguuuuuucg	uucagaaguc	2040
ggagaguggu	auaggaaccu	acuuuacaag	aguagaucuc	cucucaagua	gagacagccu	2100
ccacugccug	cuuacagagu	auuucuccgg	uaggacgagc	cggacucuau	guuuuucaac	2160
auguuagucc	gcucucaguu	uauaagagac	aucugauacu	uuuuuucauu	gucuauagug	2220
cuagauucac	aaauagguua	gguaaguagu	acucaaggaa	uuucuucuaa	gagccagacu	2280
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uucgccgacc	ccgacccggc	cgucgcugcc	guucuggugg	accacgucgg	ucuggucgau	3780
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guaguucucu	gucccgucgu	ggggggaccg	ggaguaccua	gacgaguaca	agucgugguc	4440
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cgcguacugc	augaacuuag	uacgacuaau	guuggacuua	agaggagauu	aaucacuacu	5220
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