

SEQUENCE LISTING

<110> Themis Bioscience GmbH

<120> Recombinant Zika vaccines

<130> TM 5400-02WO

<150> EP15202480.8

<151> 2015-12-23

<150> DE102015122740.1

<151> 2015-12-23

<150> EP16162688.2

<151> 2016-03-29

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<170> PatentIn version 3.5

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Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
1235 1240 1245

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala

1250	1255	1260
Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe 1265 1270 1275		
Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Val Val Pro Arg Thr 1280 1285 1290		
Asp Asn Ile Thr Leu Ala Ile Leu Ala Ala Leu Thr Pro Leu Ala 1295 1300 1305		
Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys 1310 1315 1320		
Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys 1325 1330 1335		
Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg 1340 1345 1350		
Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg 1355 1360 1365		
Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val 1370 1375 1380		
Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile 1385 1390 1395		
Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser 1400 1405 1410		
Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala 1415 1420 1425		
Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser 1430 1435 1440		
Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu 1445 1450 1455		

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr

1655

1660

1665

Gln Gly Arg Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Thr Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Asp His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu
2000 2005 2010

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr
2015 2020 2025

Glu Gln Arg Lys Thr Phe Val Glu Leu Met Lys Arg Gly Asp Leu
2030 2035 2040

Pro Val Trp Leu Ala Tyr Gln Val Ala Ser Ala Gly Ile Thr Tyr
2045 2050 2055

Thr Asp Arg Arg Trp Cys Phe Asp Gly Thr Thr Asn Asn Thr Ile

2060	2065	2070
Met Glu Asp Ser Val Pro 2075	Ala Glu Val Trp Thr 2080	Arg His Gly Glu 2085
Lys Arg Val Leu Lys Pro 2090	Arg Trp Met Asp Ala 2095	Arg Val Cys Ser 2100
Asp His Ala Ala Leu Lys 2105	Ser Phe Lys Glu Phe 2110	Ala Ala Gly Lys 2115
Arg Gly Ala Ala Phe Gly 2120	Val Met Glu Ala Leu 2125	Gly Thr Leu Pro 2130
Gly His Met Thr Glu Arg 2135	Phe Gln Glu Ala Ile 2140	Asp Asn Leu Ala 2145
Val Leu Met Arg Ala Glu 2150	Thr Gly Ser Arg Pro 2155	Tyr Lys Ala Ala 2160
Ala Ala Gln Leu Pro Glu 2165	Thr Leu Glu Thr Ile 2170	Met Leu Leu Gly 2175
Leu Leu Gly Thr Val Ser 2180	Leu Gly Ile Phe Phe 2185	Val Leu Met Arg 2190
Asn Lys Gly Ile Gly Lys 2195	Met Gly Phe Gly Met 2200	Val Thr Leu Gly 2205
Ala Ser Ala Trp Leu Met 2210	Trp Leu Ser Glu Ile 2215	Glu Pro Ala Arg 2220
Ile Ala Cys Val Leu Ile 2225	Val Val Phe Leu Leu 2230	Leu Val Val Leu 2235
Ile Pro Glu Pro Glu Lys 2240	Gln Arg Ser Pro Gln 2245	Asp Asn Gln Met 2250
Ala Ile Ile Ile Met Val 2255	Ala Val Gly Leu Leu 2260	Gly Leu Ile Thr 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Ile Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly

2465

2470

2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
 2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
 2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
 2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
 2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
 2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
 2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
 2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Ile
 2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
 2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
 2615 2620 2625

Gly His Glu Glu Pro Val Leu Val Gln Ser Tyr Gly Trp Asn Ile
 2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
 2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
 2660 2665 2670

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asp
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg

2870

2875

2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Ser Met Val
 2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys His Lys Arg Pro Arg
 2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
 2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
 2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
 2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys Gln Ser Cys Val Tyr
 2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
 2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
 2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
 3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
 3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
 3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
 3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
 3065 3070 3075

Glu	Lys	Gly	His	Arg	Ala	Leu	Ala	Leu	Ala	Ile	Ile	Lys	Tyr	Thr
3080						3085					3090			
Tyr	Gln	Asn	Lys	Val	Val	Lys	Val	Leu	Arg	Pro	Ala	Glu	Lys	Gly
3095						3100					3105			
Lys	Thr	Val	Met	Asp	Ile	Ile	Ser	Arg	Gln	Asp	Gln	Arg	Gly	Ser
3110						3115					3120			
Gly	Gln	Val	Val	Thr	Tyr	Ala	Leu	Asn	Thr	Phe	Thr	Asn	Leu	Val
3125						3130					3135			
Val	Gln	Leu	Ile	Arg	Asn	Met	Glu	Ala	Glu	Glu	Val	Leu	Glu	Met
3140						3145					3150			
Gln	Asp	Leu	Trp	Leu	Leu	Arg	Arg	Ser	Glu	Lys	Val	Thr	Asn	Trp
3155						3160					3165			
Leu	Gln	Ser	Asn	Gly	Trp	Asp	Arg	Leu	Lys	Arg	Met	Ala	Val	Ser
3170						3175					3180			
Gly	Asp	Asp	Cys	Val	Val	Lys	Pro	Ile	Asp	Asp	Arg	Phe	Ala	His
3185						3190					3195			
Ala	Leu	Arg	Phe	Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Thr
3200						3205					3210			
Gln	Glu	Trp	Lys	Pro	Ser	Thr	Gly	Trp	Asp	Asn	Trp	Glu	Glu	Val
3215						3220					3225			
Pro	Phe	Cys	Ser	His	His	Phe	Asn	Lys	Leu	His	Leu	Lys	Asp	Gly
3230						3235					3240			
Arg	Ser	Ile	Val	Val	Pro	Cys	Arg	His	Gln	Asp	Glu	Leu	Ile	Gly
3245						3250					3255			
Arg	Ala	Arg	Val	Ser	Pro	Gly	Ala	Gly	Trp	Ser	Ile	Arg	Glu	Thr
3260						3265					3270			
Ala	Cys	Leu	Ala	Lys	Ser	Tyr	Ala	Gln	Met	Trp	Gln	Leu	Leu	Tyr

3275

3280

3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
 3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
 3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
 3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
 3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
 3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
 3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
 3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
 3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
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<211> 3423

<212> PRT

<213> Zika virus isolate SSABR1 polyprotein

<400> 15

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Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
 20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Ile Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Ala Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
1205 1210 1215

Asp Val Ala His Leu Ala Leu Ile Ala Ala Phe Lys Val Arg Pro
1220 1225 1230

Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
1235 1240 1245

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
1250 1255 1260

Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe
1265 1270 1275

Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Val Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Thr Leu Ala Ile Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
1310 1315 1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Arg Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Thr Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Asp His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu
2000 2005 2010

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr
2015 2020 2025

Glu Gln Arg Lys Thr Phe Val Glu Leu Met Lys Arg Gly Asp Leu
2030 2035 2040

Pro Val Trp Leu Ala Tyr Gln Val Ala Ser Ala Gly Ile Thr Tyr
2045 2050 2055

Thr Asp Arg Arg Trp Cys Phe Asp Gly Thr Thr Asn Asn Thr Ile
2060 2065 2070

Met Glu Asp Ser Val Pro Ala Glu Val Trp Thr Arg His Gly Glu
2075 2080 2085

Lys Arg Val Leu Lys Pro Arg Trp Met Asp Ala Arg Val Cys Ser
2090 2095 2100

Asp His Ala Ala Leu Lys Ser Phe Lys Glu Phe Ala Ala Gly Lys
2105 2110 2115

Arg	Gly	Ala	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro
2120						2125					2130			
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala
2135						2140					2145			
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
2150						2155					2160			
Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly
2165						2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
2180						2185					2190			
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
2195						2200					2205			
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
2210						2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
2225						2230					2235			
Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met
2240						2245					2250			
Ala	Ile	Ile	Ile	Met	Val	Ala	Val	Gly	Leu	Leu	Gly	Leu	Ile	Thr
2255						2260					2265			
Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Ser	Asp	Leu	Ser
2270						2275					2280			
His	Leu	Met	Gly	Arg	Arg	Glu	Glu	Gly	Ala	Thr	Ile	Gly	Phe	Ser
2285						2290					2295			
Met	Asp	Ile	Asp	Leu	Arg	Pro	Ala	Ser	Ala	Trp	Ala	Ile	Tyr	Ala
2300						2305					2310			
Ala	Leu	Thr	Thr	Phe	Ile	Thr	Pro	Ala	Val	Gln	His	Ala	Val	Thr
2315						2320					2325			

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
2510 2515 2520

Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln
	2525					2530					2535			
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
	2540					2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
	2555					2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
	2570					2575					2580			
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	Tyr	Gly	Lys	Val	Ile
	2585					2590					2595			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
	2600					2605					2610			
Ile	Arg	Lys	Val	Gln	Glu	Val	Lys	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
	2615					2620					2625			
Gly	His	Glu	Glu	Pro	Val	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile
	2630					2635					2640			
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu
	2645					2650					2655			
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser
	2660					2665					2670			
Pro	Glu	Val	Glu	Glu	Ala	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val
	2675					2680					2685			
Gly	Asp	Trp	Leu	Glu	Lys	Arg	Pro	Gly	Ala	Phe	Cys	Ile	Lys	Val
	2690					2695					2700			
Leu	Cys	Pro	Tyr	Thr	Ser	Thr	Met	Met	Glu	Thr	Leu	Glu	Arg	Leu
	2705					2710					2715			
Gln	Arg	Arg	Tyr	Gly	Gly	Gly	Leu	Val	Arg	Val	Pro	Leu	Ser	Arg
	2720					2725					2730			

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Ser Met Val
2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys His Lys Arg Pro Arg
2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys Gln Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

<210> 16
<211> 3423
<212> PRT
<213> Zika virus strain Natal RGN polyprotein

<400> 16

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys

305		310		315		320
Val Thr Val Met	Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val					
	325			330		335
Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu						
	340			345		350
Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly						
	355			360		365
Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg						
	370			375		380
Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys						
	385			390		400
Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr						
	405			410		415
Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser						
	420			425		430
Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His						
	435			440		445
Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro						
	450			455		460
Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys						
	465			470		480
Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met						
	485			490		495
Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro						
	500			505		510
Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn						
	515			520		525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp

740

745

750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Glu His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Ala Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Val
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg

1160						1165						1170			
Met	Thr	Thr	Lys	Ile	Ile	Ile	Ser	Thr	Ser	Met	Ala	Val	Leu	Val	
1175						1180					1185				
Ala	Met	Ile	Leu	Gly	Gly	Phe	Ser	Met	Ser	Asp	Leu	Ala	Lys	Leu	
1190						1195					1200				
Ala	Ile	Leu	Met	Gly	Ala	Thr	Phe	Ala	Glu	Met	Asn	Thr	Gly	Gly	
1205						1210					1215				
Asp	Val	Ala	His	Leu	Ala	Leu	Ile	Ala	Ala	Phe	Lys	Val	Arg	Pro	
1220						1225					1230				
Ala	Leu	Leu	Val	Ser	Phe	Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg	
1235						1240					1245				
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala	
1250						1255					1260				
Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Ile	Asn	Gly	Phe	
1265						1270					1275				
Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Val	Val	Pro	Arg	Thr	
1280						1285					1290				
Asp	Asn	Ile	Thr	Leu	Ala	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala	
1295						1300					1305				
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys	
1310						1315					1320				
Gly	Gly	Phe	Met	Leu	Leu	Ser	Leu	Lys	Gly	Lys	Gly	Ser	Val	Lys	
1325						1330					1335				
Lys	Asn	Leu	Pro	Phe	Val	Met	Ala	Leu	Gly	Leu	Thr	Ala	Val	Arg	
1340						1345					1350				
Leu	Val	Asp	Pro	Ile	Asn	Val	Val	Gly	Leu	Leu	Leu	Leu	Thr	Arg	
1355						1360					1365				

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu

1565						1570						1575			
Val	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Ala	Ala	Trp	Asp	Gly	
1580						1585					1590				
His	Ser	Glu	Val	Gln	Leu	Leu	Ala	Val	Pro	Pro	Gly	Glu	Arg	Ala	
1595						1600					1605				
Arg	Asn	Ile	Gln	Thr	Leu	Pro	Gly	Ile	Phe	Lys	Thr	Lys	Asp	Gly	
1610						1615					1620				
Asp	Ile	Gly	Ala	Val	Ala	Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly	
1625						1630					1635				
Ser	Pro	Ile	Leu	Asp	Lys	Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly	
1640						1645					1650				
Asn	Gly	Val	Val	Ile	Lys	Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr	
1655						1660					1665				
Gln	Gly	Arg	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro	
1670						1675					1680				
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro	
1685						1690					1695				
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu	
1700						1705					1710				
Ala	Ile	Lys	Thr	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg	
1715						1720					1725				
Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro	Val	
1730						1735					1740				
Arg	Tyr	Met	Thr	Thr	Ala	Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu	
1745						1750					1755				
Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Leu	
1760						1765					1770				

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp

1970	1975	1980
Glu Asp His Ala His Trp 1985	Leu 1990	Glu Ala Arg Met Leu Leu Asp Asn 1995
Ile Tyr Leu Gln Asp Gly 2000	Leu 2005	Ile Ala Ser Leu Tyr Arg Pro Glu 2010
Ala Asp Lys Val Ala Ala 2015	Ile 2020	Glu Gly Glu Phe Lys Leu Arg Thr 2025
Glu Gln Arg Lys Thr Phe 2030	Val 2035	Glu Leu Met Lys Arg Gly Asp Leu 2040
Pro Val Trp Leu Ala Tyr 2045	Gln 2050	Val Ala Ser Ala Gly Ile Thr Tyr 2055
Thr Asp Arg Arg Trp Cys 2060	Phe 2065	Asp Gly Thr Thr Asn Asn Thr Ile 2070
Met Glu Asp Ser Val Pro 2075	Ala 2080	Glu Val Trp Thr Arg His Gly Glu 2085
Lys Arg Val Leu Lys Pro 2090	Arg 2095	Trp Met Asp Ala Arg Val Cys Ser 2100
Asp His Ala Ala Leu Lys 2105	Ser 2110	Phe Lys Glu Phe Ala Ala Gly Lys 2115
Arg Gly Ala Ala Phe Gly 2120	Val 2125	Met Glu Ala Leu Gly Thr Leu Pro 2130
Gly His Met Thr Glu Arg 2135	Phe 2140	Gln Glu Ala Ile Asp Asn Leu Ala 2145
Val Leu Met Arg Ala Glu 2150	Thr 2155	Gly Ser Arg Pro Tyr Lys Ala Ala 2160
Ala Ala Gln Leu Pro Glu 2165	Thr 2170	Leu Glu Thr Ile Met Leu Leu Gly 2175

Leu Leu Gly Thr Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg
2180 2185 2190

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
2210 2215 2220

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Ile Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His

2375

2380

2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
 2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
 2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
 2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
 2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
 2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
 2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
 2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
 2495 2500 2505

Ile Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
 2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
 2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
 2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
 2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
 2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Ile
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Val Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro

2780

2785

2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Ser Met Val
2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys His Lys Arg Pro Arg
2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys Gln Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His

3185

3190

3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

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<211> 3423

<212> PRT

<213> Zika virus strain Haiti/1225/2014 polyprotein

<400> 17

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser His Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Ile Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Ala Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
1205 1210 1215

Asp	Val	Ala	His	Leu	Ala	Leu	Ile	Ala	Ala	Phe	Lys	Val	Arg	Pro
1220						1225					1230			
Ala	Leu	Leu	Val	Ser	Phe	Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg
1235						1240					1245			
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala
1250						1255					1260			
Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Ile	Asn	Gly	Phe
1265						1270					1275			
Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Val	Val	Pro	Arg	Thr
1280						1285					1290			
Asp	Asn	Ile	Thr	Leu	Ala	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala
1295						1300					1305			
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys
1310						1315					1320			
Gly	Gly	Phe	Met	Leu	Leu	Ser	Leu	Lys	Gly	Lys	Gly	Ser	Val	Lys
1325						1330					1335			
Lys	Asn	Leu	Pro	Phe	Val	Met	Ala	Leu	Gly	Leu	Thr	Ala	Val	Arg
1340						1345					1350			
Leu	Val	Asp	Pro	Ile	Asn	Val	Val	Gly	Leu	Leu	Leu	Leu	Thr	Arg
1355						1360					1365			
Ser	Gly	Lys	Arg	Ser	Trp	Pro	Pro	Ser	Glu	Val	Leu	Thr	Ala	Val
1370						1375					1380			
Gly	Leu	Ile	Cys	Ala	Leu	Ala	Gly	Gly	Phe	Ala	Lys	Ala	Asp	Ile
1385						1390					1395			
Glu	Met	Ala	Gly	Pro	Met	Ala	Ala	Val	Gly	Leu	Leu	Ile	Val	Ser
1400						1405					1410			
Tyr	Val	Val	Ser	Gly	Lys	Ser	Val	Asp	Met	Tyr	Ile	Glu	Arg	Ala
1415						1420					1425			

Gly	Asp	Ile	Thr	Trp	Glu	Lys	Asp	Ala	Glu	Val	Thr	Gly	Asn	Ser
1430						1435					1440			
Pro	Arg	Leu	Asp	Val	Ala	Leu	Asp	Glu	Ser	Gly	Asp	Phe	Ser	Leu
1445						1450					1455			
Val	Glu	Asp	Asp	Gly	Pro	Pro	Met	Arg	Glu	Ile	Ile	Leu	Lys	Val
1460						1465					1470			
Val	Leu	Met	Thr	Ile	Cys	Gly	Met	Asn	Pro	Ile	Ala	Ile	Pro	Phe
1475						1480					1485			
Ala	Ala	Gly	Ala	Trp	Tyr	Val	Tyr	Val	Lys	Thr	Gly	Lys	Arg	Ser
1490						1495					1500			
Gly	Ala	Leu	Trp	Asp	Val	Pro	Ala	Pro	Lys	Glu	Val	Lys	Lys	Gly
1505						1510					1515			
Glu	Thr	Thr	Asp	Gly	Val	Tyr	Arg	Val	Met	Thr	Arg	Arg	Leu	Leu
1520						1525					1530			
Gly	Ser	Thr	Gln	Val	Gly	Val	Gly	Val	Met	Gln	Glu	Gly	Val	Phe
1535						1540					1545			
His	Thr	Met	Trp	His	Val	Thr	Lys	Gly	Ser	Ala	Leu	Arg	Ser	Gly
1550						1555					1560			
Glu	Gly	Arg	Leu	Asp	Pro	Tyr	Trp	Gly	Asp	Val	Lys	Gln	Asp	Leu
1565						1570					1575			
Val	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Ala	Ala	Trp	Asp	Gly
1580						1585					1590			
His	Ser	Glu	Val	Gln	Leu	Leu	Ala	Val	Pro	Pro	Gly	Glu	Arg	Ala
1595						1600					1605			
Arg	Asn	Ile	Gln	Thr	Leu	Pro	Gly	Ile	Phe	Lys	Thr	Lys	Asp	Gly
1610						1615					1620			

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Arg Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Thr Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp Tyr Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Asp His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu
2000 2005 2010

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr
2015 2020 2025

Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu
2030						2035					2040			
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr
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Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile
2060						2065					2070			
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Arg	His	Gly	Glu
2075						2080					2085			
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser
2090						2095					2100			
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys
2105						2110					2115			
Arg	Gly	Ala	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro
2120						2125					2130			
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala
2135						2140					2145			
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
2150						2155					2160			
Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly
2165						2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
2180						2185					2190			
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
2195						2200					2205			
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
2210						2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
2225						2230					2235			

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Met Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln	Val	Glu	Lys	Lys	Met	Gly	Gln	Val	Leu	Leu	Met	Ala	Val	Ala
2435						2440					2445			
Val	Ser	Ser	Ala	Ile	Leu	Ser	Arg	Thr	Ala	Trp	Gly	Trp	Gly	Glu
2450						2455					2460			
Ala	Gly	Ala	Leu	Ile	Thr	Ala	Ala	Thr	Ser	Thr	Leu	Trp	Glu	Gly
2465						2470					2475			
Ser	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser	Thr	Ala	Thr	Ser	Leu	Cys
2480						2485					2490			
Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr
2495						2500					2505			
Thr	Val	Thr	Arg	Asn	Ala	Gly	Leu	Val	Lys	Arg	Arg	Gly	Gly	Gly
2510						2515					2520			
Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln
2525						2530					2535			
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
2540						2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
2555						2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
2570						2575					2580			
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	Tyr	Gly	Lys	Val	Ile
2585						2590					2595			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
2600						2605					2610			
Ile	Arg	Lys	Val	Gln	Glu	Val	Lys	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
2615						2620					2625			
Gly	His	Glu	Glu	Pro	Val	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile
2630						2635					2640			

Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu
2645						2650					2655			
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser
2660						2665					2670			
Pro	Glu	Val	Glu	Glu	Ala	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val
2675						2680					2685			
Gly	Asp	Trp	Leu	Glu	Lys	Arg	Pro	Gly	Ala	Phe	Cys	Ile	Lys	Val
2690						2695					2700			
Leu	Cys	Pro	Tyr	Thr	Ser	Thr	Met	Met	Glu	Thr	Leu	Glu	Arg	Leu
2705						2710					2715			
Gln	Arg	Arg	Tyr	Gly	Gly	Gly	Leu	Val	Arg	Val	Pro	Leu	Ser	Arg
2720						2725					2730			
Asn	Ser	Thr	His	Glu	Met	Tyr	Trp	Val	Ser	Gly	Ala	Lys	Ser	Asn
2735						2740					2745			
Thr	Ile	Lys	Ser	Val	Ser	Thr	Thr	Ser	Gln	Leu	Leu	Leu	Gly	Arg
2750						2755					2760			
Met	Asp	Gly	Pro	Arg	Arg	Pro	Val	Lys	Tyr	Glu	Glu	Asp	Val	Asn
2765						2770					2775			
Leu	Gly	Ser	Gly	Thr	Arg	Ala	Val	Val	Ser	Cys	Ala	Glu	Ala	Pro
2780						2785					2790			
Asn	Met	Lys	Ile	Ile	Gly	Asn	Arg	Ile	Glu	Arg	Ile	Arg	Ser	Glu
2795						2800					2805			
His	Ala	Glu	Thr	Trp	Phe	Phe	Asp	Glu	Asn	His	Pro	Tyr	Arg	Thr
2810						2815					2820			
Trp	Ala	Tyr	His	Gly	Ser	Tyr	Glu	Ala	Pro	Thr	Gln	Gly	Ser	Ala
2825						2830					2835			

Ser	Ser	Leu	Ile	Asn	Gly	Val	Val	Arg	Leu	Leu	Ser	Lys	Pro	Trp
2840						2845					2850			
Asp	Val	Val	Thr	Gly	Val	Thr	Gly	Ile	Ala	Met	Thr	Asp	Thr	Thr
2855						2860					2865			
Pro	Tyr	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr	Arg
2870						2875					2880			
Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Val	Met	Ser	Met	Val
2885						2890					2895			
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	His	Lys	Arg	Pro	Arg
2900						2905					2910			
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala
2915						2920					2925			
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala
2930						2935					2940			
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys
2945						2950					2955			
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	Gln	Ser	Cys	Val	Tyr
2960						2965					2970			
Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys
2975						2980					2985			
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg
2990						2995					3000			
Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp
3005						3010					3015			
Met	Gly	Arg	Glu	Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu
3020						3025					3030			
Gln	Arg	Leu	Gly	Tyr	Val	Leu	Glu	Glu	Met	Ser	Arg	Ile	Pro	Gly
3035						3040					3045			

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
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<211> 3423

<212> PRT

<213> Zika virus strain PRVABC59 polyprotein

<400> 18

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Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Thr
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr

210

215

220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
 225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
 245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
 260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
 275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
 290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
 305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
 325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
 340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
 355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
 370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
 385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
 405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
 420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr

645

650

655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
 660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
 675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
 690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
 705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
 725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
 740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
 755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
 770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
 785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
 805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
 820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
 835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
 850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu

1070

1075

1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
 1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
 1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
 1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
 1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
 1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
 1160 1165 1170

Met Thr Thr Lys Ile Ile Ile Ser Thr Ser Met Ala Val Leu Val
 1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
 1190 1195 1200

Ala Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
 1205 1210 1215

Asp Val Ala His Leu Ala Leu Ile Ala Ala Phe Lys Val Arg Pro
 1220 1225 1230

Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
 1235 1240 1245

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
 1250 1255 1260

Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe
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Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Val Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Thr Leu Ala Ile Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
1310 1315 1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe

1475						1480						1485			
Ala	Ala	Gly	Ala	Trp	Tyr	Val	Tyr	Val	Lys	Thr	Gly	Lys	Arg	Ser	
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Gly	Ala	Leu	Trp	Asp	Val	Pro	Ala	Pro	Lys	Glu	Val	Lys	Lys	Gly	
1505						1510					1515				
Glu	Thr	Thr	Asp	Gly	Val	Tyr	Arg	Val	Met	Thr	Arg	Arg	Leu	Leu	
1520						1525					1530				
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1535						1540					1545				
His	Thr	Met	Trp	His	Val	Thr	Lys	Gly	Ser	Ala	Leu	Arg	Ser	Gly	
1550						1555					1560				
Glu	Gly	Arg	Leu	Asp	Pro	Tyr	Trp	Gly	Asp	Val	Lys	Gln	Asp	Leu	
1565						1570					1575				
Val	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Ala	Ala	Trp	Asp	Gly	
1580						1585					1590				
His	Ser	Glu	Val	Gln	Leu	Leu	Ala	Val	Pro	Pro	Gly	Glu	Arg	Ala	
1595						1600					1605				
Arg	Asn	Ile	Gln	Thr	Leu	Pro	Gly	Ile	Phe	Lys	Thr	Lys	Asp	Gly	
1610						1615					1620				
Asp	Ile	Gly	Ala	Val	Ala	Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly	
1625						1630					1635				
Ser	Pro	Ile	Leu	Asp	Lys	Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly	
1640						1645					1650				
Asn	Gly	Val	Val	Ile	Lys	Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr	
1655						1660					1665				
Gln	Gly	Arg	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro	
1670						1675					1680				

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Thr Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe

1880						1885						1890			
Glu Thr 1895	Glu Phe	Gln Lys	Thr	Lys His	Gln Glu	Trp	Asp Phe	Val							
Val Thr 1910	Thr Asp	Ile Ser	Glu	Met Gly	Ala Asn	Phe	Lys Ala	Asp							
Arg Val 1925	Ile Asp	Ser Arg	Arg	Cys Leu	Lys Pro	Val	Ile Leu	Asp							
Gly Glu 1940	Arg Val	Ile Leu	Ala	Gly Pro	Met Pro	Val	Thr His	Ala							
Ser Ala 1955	Ala Gln	Arg Arg	Gly	Arg Ile	Gly Arg	Asn	Pro Asn	Lys							
Pro Gly 1970	Asp Glu	Tyr Leu	Tyr	Gly Gly	Gly Cys	Ala	Glu Thr	Asp							
Glu Asp 1985	His Ala	His Trp	Leu	Glu Ala	Arg Met	Leu	Leu Asp	Asn							
Ile Tyr 2000	Leu Gln	Asp Gly	Leu	Ile Ala	Ser Leu	Tyr	Arg Pro	Glu							
Ala Asp 2015	Lys Val	Ala Ala	Ile	Glu Gly	Glu Phe	Lys	Leu Arg	Thr							
Glu Gln 2030	Arg Lys	Thr Phe	Val	Glu Leu	Met Lys	Arg	Gly Asp	Leu							
Pro Val 2045	Trp Leu	Ala Tyr	Gln	Val Ala	Ser Ala	Gly	Ile Thr	Tyr							
Thr Asp 2060	Arg Arg	Trp Cys	Phe	Asp Gly	Thr Thr	Asn	Asn Thr	Ile							
Met Glu 2075	Asp Ser	Val Pro	Ala	Glu Val	Trp Thr	Arg	His Gly	Glu							

Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser
2090						2095					2100			
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys
2105						2110					2115			
Arg	Gly	Ala	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro
2120						2125					2130			
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala
2135						2140					2145			
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
2150						2155					2160			
Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly
2165						2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
2180						2185					2190			
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
2195						2200					2205			
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
2210						2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
2225						2230					2235			
Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met
2240						2245					2250			
Ala	Ile	Ile	Ile	Met	Val	Ala	Val	Gly	Leu	Leu	Gly	Leu	Ile	Thr
2255						2260					2265			
Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Ser	Asp	Leu	Ser
2270						2275					2280			
His	Leu	Met	Gly	Arg	Arg	Glu	Glu	Gly	Ala	Thr	Ile	Gly	Phe	Ser

2285

2290

2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Ile
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Val Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Val Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val

2690

2695

2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Ser Met Val
2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys His Lys Arg Pro Arg
2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys Gln Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly

3095

3100

3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

<210> 19
<211> 3423
<212> PRT
<213> Zika virus strain: MR766-NIID polyprotein

<400> 19

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Asn Pro Leu Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
100 105 110

Ile Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
130 135 140

Ile Ser Phe Ala Thr Thr Leu Gly Val Asn Lys Cys His Val Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Val Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Thr Val Asn Asp Ile Gly Tyr
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Lys Leu Phe Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Ile Pro Val Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val
770 775 780

Met Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Ile Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Glu Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Lys Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Glu His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Arg Glu Ala Ala His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Val Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val Tyr Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile	Arg	Pro	Arg	Lys	Glu	Pro	Glu	Ser	Asn	Leu	Val	Arg	Ser	Met
1130						1135					1140			
Val	Thr	Ala	Gly	Ser	Thr	Asp	His	Met	Asp	His	Phe	Ser	Leu	Gly
1145						1150					1155			
Val	Leu	Val	Ile	Leu	Leu	Met	Val	Gln	Glu	Gly	Leu	Lys	Lys	Arg
1160						1165					1170			
Met	Thr	Thr	Lys	Ile	Ile	Met	Ser	Thr	Ser	Met	Ala	Val	Leu	Val
1175						1180					1185			
Val	Met	Ile	Leu	Gly	Gly	Phe	Ser	Met	Ser	Asp	Leu	Ala	Lys	Leu
1190						1195					1200			
Val	Ile	Leu	Met	Gly	Ala	Thr	Phe	Ala	Glu	Met	Asn	Thr	Gly	Gly
1205						1210					1215			
Asp	Val	Ala	His	Leu	Ala	Leu	Val	Ala	Ala	Phe	Lys	Val	Arg	Pro
1220						1225					1230			
Ala	Leu	Leu	Val	Ser	Phe	Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg
1235						1240					1245			
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala
1250						1255					1260			
Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Ile	Asn	Gly	Phe
1265						1270					1275			
Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Ala	Val	Pro	Arg	Thr
1280						1285					1290			
Asp	Asn	Ile	Ala	Leu	Pro	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala
1295						1300					1305			
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys
1310						1315					1320			
Gly	Gly	Ile	Met	Leu	Leu	Ser	Leu	Lys	Gly	Lys	Gly	Ser	Val	Lys
1325						1330					1335			

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Val Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Glu Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Ala Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ala Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

Leu Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Lys Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Lys Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys Asn Gln Glu Trp Asp Phe Val
1895 1900 1905

Ile Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Met Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Gly His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu
2000 2005 2010

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr
2015 2020 2025

Glu Gln Arg Lys Thr Phe Val Glu Leu Met Lys Arg Gly Asp Leu
2030 2035 2040

Pro Val Trp Leu Ala Tyr Gln Val Ala Ser Ala Gly Ile Thr Tyr
2045 2050 2055

Thr Asp Arg Arg Trp Cys Phe Asp Gly Thr Thr Asn Asn Thr Ile
2060 2065 2070

Met Glu Asp Ser Val Pro Ala Glu Val Trp Thr Lys Tyr Gly Glu
2075 2080 2085

Lys Arg Val Leu Lys Pro Arg Trp Met Asp Ala Arg Val Cys Ser
2090 2095 2100

Asp His Ala Ala Leu Lys Ser Phe Lys Glu Phe Ala Ala Gly Lys
2105 2110 2115

Arg Gly Ala Ala Leu Gly Val Met Glu Ala Leu Gly Thr Leu Pro
2120 2125 2130

Gly His Met Thr Glu Arg Phe Gln Glu Ala Ile Asp Asn Leu Ala
2135 2140 2145

Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
2150						2155					2160			
Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly
2165						2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
2180						2185					2190			
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
2195						2200					2205			
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
2210						2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
2225						2230					2235			
Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met
2240						2245					2250			
Ala	Ile	Ile	Ile	Met	Val	Ala	Val	Gly	Leu	Leu	Gly	Leu	Ile	Thr
2255						2260					2265			
Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Asn	Asp	Ile	Ala
2270						2275					2280			
His	Leu	Met	Gly	Arg	Arg	Glu	Glu	Gly	Ala	Thr	Met	Gly	Phe	Ser
2285						2290					2295			
Met	Asp	Ile	Asp	Leu	Arg	Pro	Ala	Ser	Ala	Trp	Ala	Ile	Tyr	Ala
2300						2305					2310			
Ala	Leu	Thr	Thr	Leu	Ile	Thr	Pro	Ala	Val	Gln	His	Ala	Val	Thr
2315						2320					2325			
Thr	Ser	Tyr	Asn	Asn	Tyr	Ser	Leu	Met	Ala	Met	Ala	Thr	Gln	Ala
2330						2335					2340			

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Leu Gly Val Pro Leu Leu Met Met Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Ile Ser Ser Ala Val Leu Leu Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Val
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Arg Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Met Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Thr Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Met Glu Arg Leu
2705 2710 2715

Gln Arg Arg His Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Ile	Ile	Lys	Ser	Val	Ser	Thr	Thr	Ser	Gln	Leu	Leu	Leu	Gly	Arg
2750						2755					2760			
Met	Asp	Gly	Pro	Arg	Arg	Pro	Val	Lys	Tyr	Glu	Glu	Asp	Val	Asn
2765						2770					2775			
Leu	Gly	Ser	Gly	Thr	Arg	Ala	Val	Ala	Ser	Cys	Ala	Glu	Ala	Pro
2780						2785					2790			
Asn	Met	Lys	Ile	Ile	Gly	Arg	Arg	Ile	Glu	Arg	Ile	Arg	Asn	Glu
2795						2800					2805			
His	Ala	Glu	Thr	Trp	Phe	Leu	Asp	Glu	Asn	His	Pro	Tyr	Arg	Thr
2810						2815					2820			
Trp	Ala	Tyr	His	Gly	Ser	Tyr	Glu	Ala	Pro	Thr	Gln	Gly	Ser	Ala
2825						2830					2835			
Ser	Ser	Leu	Val	Asn	Gly	Val	Val	Arg	Leu	Leu	Ser	Lys	Pro	Trp
2840						2845					2850			
Asp	Val	Val	Thr	Gly	Val	Thr	Gly	Ile	Ala	Met	Thr	Asp	Thr	Thr
2855						2860					2865			
Pro	Tyr	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr	Arg
2870						2875					2880			
Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Val	Met	Asn	Ile	Val
2885						2890					2895			
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	Arg	Lys	Arg	Pro	Arg
2900						2905					2910			
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala
2915						2920					2925			
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala
2930						2935					2940			
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Arg
2945						2950					2955			

Glu Arg Glu His His Leu Arg Gly Glu Cys His Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Ile Leu Glu Glu Met Asn Arg Ala Pro Gly
3035 3040 3045

Gly Lys Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Lys Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Glu Gly His Arg Thr Leu Ala Leu Ala Val Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Gly Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln	Asp	Leu	Trp	Leu	Leu	Arg	Lys	Pro	Glu	Lys	Val	Thr	Arg	Trp
	3155					3160					3165			
Leu	Gln	Ser	Asn	Gly	Trp	Asp	Arg	Leu	Lys	Arg	Met	Ala	Val	Ser
	3170					3175					3180			
Gly	Asp	Asp	Cys	Val	Val	Lys	Pro	Ile	Asp	Asp	Arg	Phe	Ala	His
	3185					3190					3195			
Ala	Leu	Arg	Phe	Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Thr
	3200					3205					3210			
Gln	Glu	Trp	Lys	Pro	Ser	Thr	Gly	Trp	Ser	Asn	Trp	Glu	Glu	Val
	3215					3220					3225			
Pro	Phe	Cys	Ser	His	His	Phe	Asn	Lys	Leu	Tyr	Leu	Lys	Asp	Gly
	3230					3235					3240			
Arg	Ser	Ile	Val	Val	Pro	Cys	Arg	His	Gln	Asp	Glu	Leu	Ile	Gly
	3245					3250					3255			
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	3260					3265					3270			
Ala	Cys	Leu	Ala	Lys	Ser	Tyr	Ala	Gln	Met	Trp	Gln	Leu	Leu	Tyr
	3275					3280					3285			
Phe	His	Arg	Arg	Asp	Leu	Arg	Leu	Met	Ala	Asn	Ala	Ile	Cys	Ser
	3290					3295					3300			
Ala	Val	Pro	Val	Asp	Trp	Val	Pro	Thr	Gly	Arg	Thr	Thr	Trp	Ser
	3305					3310					3315			
Ile	His	Gly	Lys	Gly	Glu	Trp	Met	Thr	Thr	Glu	Asp	Met	Leu	Met
	3320					3325					3330			
Val	Trp	Asn	Arg	Val	Trp	Ile	Glu	Glu	Asn	Asp	His	Met	Glu	Asp
	3335					3340					3345			
Lys	Thr	Pro	Val	Thr	Lys	Trp	Thr	Asp	Ile	Pro	Tyr	Leu	Gly	Lys
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Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
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Thr Thr Trp Ala Glu Asn Ile Lys Asp Thr Val Asn Met Val Arg
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<212> PRT
<213> Zika virus NC_012532.1 polyprotein

<400> 20

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20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
100 105 110

Ile Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg

115

120

125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
 130 135 140

Ile Ser Phe Ala Thr Thr Leu Gly Val Asn Lys Cys His Val Gln Ile
 145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
 165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
 180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
 195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
 210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
 225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
 245 250 255

Phe Ala Leu Val Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
 260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
 275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
 290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
 305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
 325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
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Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Gly Tyr Glu Thr Asp Glu
435 440 445

Asp Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala
450 455 460

Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr
465 470 475 480

Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His
485 490 495

Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His
500 505 510

Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu
515 520 525

Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu
530 535 540

Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu

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Ala	Glu	Met	Asp	Gly	Ala	Lys	Gly	Arg	Leu	Phe	Ser	Gly	His	Leu	Lys
				565					570					575	
Cys	Arg	Leu	Lys	Met	Asp	Lys	Leu	Arg	Leu	Lys	Gly	Val	Ser	Tyr	Ser
			580					585					590		
Leu	Cys	Thr	Ala	Ala	Phe	Thr	Phe	Thr	Lys	Val	Pro	Ala	Glu	Thr	Leu
		595					600					605			
His	Gly	Thr	Val	Thr	Val	Glu	Val	Gln	Tyr	Ala	Gly	Thr	Asp	Gly	Pro
	610					615					620				
Cys	Lys	Ile	Pro	Val	Gln	Met	Ala	Val	Asp	Met	Gln	Thr	Leu	Thr	Pro
625					630					635					640
Val	Gly	Arg	Leu	Ile	Thr	Ala	Asn	Pro	Val	Ile	Thr	Glu	Ser	Thr	Glu
			645						650					655	
Asn	Ser	Lys	Met	Met	Leu	Glu	Leu	Asp	Pro	Pro	Phe	Gly	Asp	Ser	Tyr
			660					665					670		
Ile	Val	Ile	Gly	Val	Gly	Asp	Lys	Lys	Ile	Thr	His	His	Trp	His	Arg
	675						680					685			
Ser	Gly	Ser	Thr	Ile	Gly	Lys	Ala	Phe	Glu	Ala	Thr	Val	Arg	Gly	Ala
	690					695					700				
Lys	Arg	Met	Ala	Val	Leu	Gly	Asp	Thr	Ala	Trp	Asp	Phe	Gly	Ser	Val
705					710					715					720
Gly	Gly	Val	Phe	Asn	Ser	Leu	Gly	Lys	Gly	Ile	His	Gln	Ile	Phe	Gly
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Ala	Ala	Phe	Lys	Ser	Leu	Phe	Gly	Gly	Met	Ser	Trp	Phe	Ser	Gln	Ile
			740					745					750		
Leu	Ile	Gly	Thr	Leu	Leu	Val	Trp	Leu	Gly	Leu	Asn	Thr	Lys	Asn	Gly
		755					760					765			

Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile Phe Leu
770 775 780

Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val Asp Phe Ser Lys
785 790 795 800

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

Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser Pro Arg Arg Leu
820 825 830

Ala Ala Ala Val Lys Gln Ala Trp Glu Glu Gly Ile Cys Gly Ile Ser
835 840 845

Ser Val Ser Arg Met Glu Asn Ile Met Trp Lys Ser Val Glu Gly Glu
850 855 860

Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu Thr Val Val Val
865 870 875 880

Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln Arg Leu Pro Val
885 890 895

Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp Gly Lys Ser Tyr
900 905 910

Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val Val Asp Gly Asp
915 920 925

Thr Leu Lys Glu Cys Pro Leu Glu His Arg Ala Trp Asn Ser Phe Leu
930 935 940

Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser Val Trp Leu Lys
945 950 955 960

Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala Val Ile Gly Thr
965 970 975

Ala Val Lys Gly Arg Glu Ala Ala His Ser Asp Leu Gly Tyr Trp Ile

980

985

990

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

Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg Met Thr Thr Lys
 1160 1165 1170

Ile Ile Met Ser Thr Ser Met Ala Val Leu Val Val Met Ile Leu
 1175 1180 1185

Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu Val Ile Leu Met
1190 1195 1200

Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly Asp Val Ala His
1205 1210 1215

Leu Ala Leu Val Ala Ala Phe Lys Val Arg Pro Ala Leu Leu Val
1220 1225 1230

Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg Glu Ser Met Leu
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Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala Ile Ser Ala Leu
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Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe Ala Leu Ala Trp
1265 1270 1275

Leu Ala Ile Arg Ala Met Ala Val Pro Arg Thr Asp Asn Ile Ala
1280 1285 1290

Leu Pro Ile Leu Ala Ala Leu Thr Pro Leu Ala Arg Gly Thr Leu
1295 1300 1305

Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys Gly Gly Ile Met
1310 1315 1320

Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys Lys Asn Leu Pro
1325 1330 1335

Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg Val Val Asp Pro
1340 1345 1350

Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg Ser Gly Lys Arg
1355 1360 1365

Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val Gly Leu Ile Cys
1370 1375 1380

Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile Glu Met Ala Gly

1385

1390

1395

Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser Tyr Val Val Ser
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Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala Gly Asp Ile Thr
1415 1420 1425

Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser Pro Arg Leu Asp
1430 1435 1440

Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu Val Glu Glu Asp
1445 1450 1455

Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val Val Leu Met Ala
1460 1465 1470

Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe Ala Ala Gly Ala
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Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser Gly Ala Leu Trp
1490 1495 1500

Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly Glu Thr Thr Asp
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Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu Gly Ser Thr Gln
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Val Gly Val Gly Val Met Gln Glu Gly Val Phe His Thr Met Trp
1535 1540 1545

His Val Thr Lys Gly Ala Ala Leu Arg Ser Gly Glu Gly Arg Leu
1550 1555 1560

Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu Val Ser Tyr Cys
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Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly Leu Ser Glu Val
1580 1585 1590

Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala Arg Asn Ile Gln
1595 1600 1605

Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly Asp Ile Gly Ala
1610 1615 1620

Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly Ser Pro Ile Leu
1625 1630 1635

Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly Asn Gly Val Val
1640 1645 1650

Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr Gln Gly Lys Arg
1655 1660 1665

Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro Ser Met Leu Lys
1670 1675 1680

Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro Gly Ala Gly Lys
1685 1690 1695

Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu Ala Ile Lys Lys
1700 1705 1710

Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg Val Val Ala Ala
1715 1720 1725

Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val Arg Tyr Met Thr
1730 1735 1740

Thr Ala Val Asn Val Thr His Ser Gly Thr Glu Ile Val Asp Leu
1745 1750 1755

Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu Gln Pro Ile Arg
1760 1765 1770

Val Pro Asn Tyr Asn Leu Asn Ile Met Asp Glu Ala His Phe Thr
1775 1780 1785

Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile Ser Thr Arg Val

1790						1795						1800			
Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr	Ala	Thr	Pro	Pro	
1805						1810					1815				
Gly	Thr	Arg	Asp	Ala	Phe	Pro	Asp	Ser	Asn	Ser	Pro	Ile	Met	Asp	
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Thr	Glu	Val	Glu	Val	Pro	Glu	Arg	Ala	Trp	Ser	Ser	Gly	Phe	Asp	
1835						1840					1845				
Trp	Val	Thr	Asp	His	Ser	Gly	Lys	Thr	Val	Trp	Phe	Val	Pro	Ser	
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Val	Arg	Asn	Gly	Asn	Glu	Ile	Ala	Ala	Cys	Leu	Thr	Lys	Ala	Gly	
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Lys	Arg	Val	Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe	Glu	Thr	Glu	Phe	
1880						1885					1890				
Gln	Lys	Thr	Lys	Asn	Gln	Glu	Trp	Asp	Phe	Val	Ile	Thr	Thr	Asp	
1895						1900					1905				
Ile	Ser	Glu	Met	Gly	Ala	Asn	Phe	Lys	Ala	Asp	Arg	Val	Ile	Asp	
1910						1915					1920				
Ser	Arg	Arg	Cys	Leu	Lys	Pro	Val	Ile	Leu	Asp	Gly	Glu	Arg	Val	
1925						1930					1935				
Ile	Leu	Ala	Gly	Pro	Met	Pro	Val	Thr	His	Ala	Ser	Ala	Ala	Gln	
1940						1945					1950				
Arg	Arg	Gly	Arg	Ile	Gly	Arg	Asn	Pro	Asn	Lys	Pro	Gly	Asp	Glu	
1955						1960					1965				
Tyr	Met	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp	Glu	Gly	His	Ala	
1970						1975					1980				
His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn	Ile	Tyr	Leu	Gln	
1985						1990					1995				

Asp 2000	Gly	Leu	Ile	Ala	Ser	Leu 2005	Tyr	Arg	Pro	Glu	Ala 2010	Asp	Lys	Val
Ala 2015	Ala	Ile	Glu	Gly	Glu	Phe 2020	Lys	Leu	Arg	Thr	Glu 2025	Gln	Arg	Lys
Thr 2030	Phe	Val	Glu	Leu	Met	Lys 2035	Arg	Gly	Asp	Leu	Pro 2040	Val	Trp	Leu
Ala 2045	Tyr	Gln	Val	Ala	Ser	Ala 2050	Gly	Ile	Thr	Tyr	Thr 2055	Asp	Arg	Arg
Trp 2060	Cys	Phe	Asp	Gly	Thr	Thr 2065	Asn	Asn	Thr	Ile	Met 2070	Glu	Asp	Ser
Val 2075	Pro	Ala	Glu	Val	Trp	Thr 2080	Lys	Tyr	Gly	Glu	Lys 2085	Arg	Val	Leu
Lys 2090	Pro	Arg	Trp	Met	Asp	Ala 2095	Arg	Val	Cys	Ser	Asp 2100	His	Ala	Ala
Leu 2105	Lys	Ser	Phe	Lys	Glu	Phe 2110	Ala	Ala	Gly	Lys	Arg 2115	Gly	Ala	Ala
Leu 2120	Gly	Val	Met	Glu	Ala	Leu 2125	Gly	Thr	Leu	Pro	Gly 2130	His	Met	Thr
Glu 2135	Arg	Phe	Gln	Glu	Ala	Ile 2140	Asp	Asn	Leu	Ala	Val 2145	Leu	Met	Arg
Ala 2150	Glu	Thr	Gly	Ser	Arg	Pro 2155	Tyr	Lys	Ala	Ala	Ala 2160	Ala	Gln	Leu
Pro 2165	Glu	Thr	Leu	Glu	Thr	Ile 2170	Met	Leu	Leu	Gly	Leu 2175	Leu	Gly	Thr
Val 2180	Ser	Leu	Gly	Ile	Phe	Phe 2185	Val	Leu	Met	Arg	Asn 2190	Lys	Gly	Ile
Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly	Ala	Ser	Ala	Trp

2195

2200

2205

Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg Ile Ala Cys Val
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Leu Ile Val Val Phe Leu Leu Leu Val Val Leu Ile Pro Glu Pro
 2225 2230 2235

Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met Ala Ile Ile Ile
 2240 2245 2250

Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr Ala Asn Glu Leu
 2255 2260 2265

Gly Trp Leu Glu Arg Thr Lys Asn Asp Ile Ala His Leu Met Gly
 2270 2275 2280

Arg Arg Glu Glu Gly Ala Thr Met Gly Phe Ser Met Asp Ile Asp
 2285 2290 2295

Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala Ala Leu Thr Thr
 2300 2305 2310

Leu Ile Thr Pro Ala Val Gln His Ala Val Thr Thr Ser Tyr Asn
 2315 2320 2325

Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala Gly Val Leu Phe
 2330 2335 2340

Gly Met Gly Lys Gly Met Pro Phe Met His Gly Asp Leu Gly Val
 2345 2350 2355

Pro Leu Leu Met Met Gly Cys Tyr Ser Gln Leu Thr Pro Leu Thr
 2360 2365 2370

Leu Ile Val Ala Ile Ile Leu Leu Val Ala His Tyr Met Tyr Leu
 2375 2380 2385

Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala Ala Gln Lys Arg
 2390 2395 2400

Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val Asp Gly Ile Val
2405 2410 2415

Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro Gln Val Glu Lys
2420 2425 2430

Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala Ile Ser Ser Ala
2435 2440 2445

Val Leu Leu Arg Thr Ala Trp Gly Trp Gly Glu Ala Gly Ala Leu
2450 2455 2460

Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly Ser Pro Asn Lys
2465 2470 2475

Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys Asn Ile Phe Arg
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Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr Thr Val Thr Arg
2495 2500 2505

Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly Thr Gly Glu Thr
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Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln Met Ser Ala Leu
2525 2530 2535

Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr Glu Val Cys Arg
2540 2545 2550

Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val Ala Thr Gly Gly
2555 2560 2565

His Ala Val Ser Arg Gly Ser Ala Lys Ile Arg Trp Leu Glu Glu
2570 2575 2580

Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Val Asp Leu Gly Cys
2585 2590 2595

Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr Ile Arg Lys Val

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Pro	Met	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile	Val	Arg	Leu	Lys	
2630						2635					2640				
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2645						2650					2655				
Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser	Pro	Glu	Val	Glu	
2660						2665					2670				
Glu	Thr	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val	Gly	Asp	Trp	Leu	
2675						2680					2685				
Glu	Lys	Arg	Pro	Gly	Ala	Phe	Cys	Ile	Lys	Val	Leu	Cys	Pro	Tyr	
2690						2695					2700				
Thr	Ser	Thr	Met	Met	Glu	Thr	Met	Glu	Arg	Leu	Gln	Arg	Arg	His	
2705						2710					2715				
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2720						2725					2730				
Glu	Met	Tyr	Trp	Val	Ser	Gly	Ala	Lys	Ser	Asn	Ile	Ile	Lys	Ser	
2735						2740					2745				
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Arg	Arg	Pro	Val	Lys	Tyr	Glu	Glu	Asp	Val	Asn	Leu	Gly	Ser	Gly	
2765						2770					2775				
Thr	Arg	Ala	Val	Ala	Ser	Cys	Ala	Glu	Ala	Pro	Asn	Met	Lys	Ile	
2780						2785					2790				
Ile	Gly	Arg	Arg	Ile	Glu	Arg	Ile	Arg	Asn	Glu	His	Ala	Glu	Thr	
2795						2800					2805				

Trp Phe Leu Asp Glu Asn His Pro Tyr Arg Thr Trp Ala Tyr His
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Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala Ser Ser Leu Val
2825 2830 2835

Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp Asp Val Val Thr
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Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr Pro Tyr Gly Gln
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Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg Val Pro Asp Pro
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Gln Glu Gly Thr Arg Gln Val Met Asn Ile Val Ser Ser Trp Leu
2885 2890 2895

Trp Lys Glu Leu Gly Lys Arg Lys Arg Pro Arg Val Cys Thr Lys
2900 2905 2910

Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala Ala Leu Gly Ala
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Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala Val Glu Ala Val
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Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Arg Glu Arg Glu His
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His Leu Arg Gly Glu Cys His Ser Cys Val Tyr Asn Met Met Gly
2960 2965 2970

Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys Ala Lys Gly Ser
2975 2980 2985

Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg Phe Leu Glu Phe
2990 2995 3000

Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp Met Gly Arg Glu

3005	3010	3015
Asn Ser Gly Gly Gly Val 3020	Glu Gly Leu Gly Leu 3025	Gln Arg Leu Gly 3030
Tyr Ile Leu Glu Glu Met 3035	Asn Arg Ala Pro Gly 3040	Gly Lys Met Tyr 3045
Ala Asp Asp Thr Ala Gly 3050	Trp Asp Thr Arg Ile 3055	Ser Lys Phe Asp 3060
Leu Glu Asn Glu Ala Leu 3065	Ile Thr Asn Gln Met 3070	Glu Glu Gly His 3075
Arg Thr Leu Ala Leu Ala 3080	Val Ile Lys Tyr Thr 3085	Tyr Gln Asn Lys 3090
Val Val Lys Val Leu Arg 3095	Pro Ala Glu Gly Gly 3100	Lys Thr Val Met 3105
Asp Ile Ile Ser Arg Gln 3110	Asp Gln Arg Gly Ser 3115	Gly Gln Val Val 3120
Thr Tyr Ala Leu Asn Thr 3125	Phe Thr Asn Leu Val 3130	Val Gln Leu Ile 3135
Arg Asn Met Glu Ala Glu 3140	Glu Val Leu Glu Met 3145	Gln Asp Leu Trp 3150
Leu Leu Arg Lys Pro Glu 3155	Lys Val Thr Arg Trp 3160	Leu Gln Ser Asn 3165
Gly Trp Asp Arg Leu Lys 3170	Arg Met Ala Val Ser 3175	Gly Asp Asp Cys 3180
Val Val Lys Pro Ile Asp 3185	Asp Arg Phe Ala His 3190	Ala Leu Arg Phe 3195
Leu Asn Asp Met Gly Lys 3200	Val Arg Lys Asp Thr 3205	Gln Glu Trp Lys 3210

Pro Ser Thr Gly Trp Ser Asn Trp Glu Glu Val Pro Phe Cys Ser
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His His Phe Asn Lys Leu Tyr Leu Lys Asp Gly Arg Ser Ile Val
3230 3235 3240

Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly Arg Ala Arg Val
3245 3250 3255

Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr Ala Cys Leu Ala
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Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr Phe His Arg Arg
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Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser Ala Val Pro Val
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Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser Ile His Gly Lys
3305 3310 3315

Gly Glu Trp Met Thr Thr Glu Asp Met Leu Met Val Trp Asn Arg
3320 3325 3330

Val Trp Ile Glu Glu Asn Asp His Met Glu Asp Lys Thr Pro Val
3335 3340 3345

Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys Arg Glu Asp Leu
3350 3355 3360

Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg Thr Thr Trp Ala
3365 3370 3375

Glu Asn Ile Lys Asp Thr Val Asn Met Val Arg Arg Ile Ile Gly
3380 3385 3390

Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr Gln Val Arg Tyr
3395 3400 3405

Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu

3410

3415

<210> 21
 <211> 3423
 <212> PRT
 <213> Zika virus strain ZikaSPH2015 polyprotein

<400> 21

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
 1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
 20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
 35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
 50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
 65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
 85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
 100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
 115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
 130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
 145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
 165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Ile Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser His Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

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

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
1250 1255 1260

Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe
1265 1270 1275

Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Val Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Thr Leu Ala Ile Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
1310 1315 1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro	Arg	Leu	Asp	Val	Ala	Leu	Asp	Glu	Ser	Gly	Asp	Phe	Ser	Leu
1445						1450					1455			
Val	Glu	Asp	Asp	Gly	Pro	Pro	Met	Arg	Glu	Ile	Ile	Leu	Lys	Val
1460						1465					1470			
Val	Leu	Met	Thr	Ile	Cys	Gly	Met	Asn	Pro	Ile	Ala	Ile	Pro	Phe
1475						1480					1485			
Ala	Ala	Gly	Ala	Trp	Tyr	Val	Tyr	Val	Lys	Thr	Gly	Lys	Arg	Ser
1490						1495					1500			
Gly	Ala	Leu	Trp	Asp	Val	Pro	Ala	Pro	Lys	Glu	Val	Lys	Lys	Gly
1505						1510					1515			
Glu	Thr	Thr	Asp	Gly	Val	Tyr	Arg	Val	Met	Thr	Arg	Arg	Leu	Leu
1520						1525					1530			
Gly	Ser	Thr	Gln	Val	Gly	Val	Gly	Val	Met	Gln	Glu	Gly	Val	Phe
1535						1540					1545			
His	Thr	Met	Trp	His	Val	Thr	Lys	Gly	Ser	Ala	Leu	Arg	Ser	Gly
1550						1555					1560			
Glu	Gly	Arg	Leu	Asp	Pro	Tyr	Trp	Gly	Asp	Val	Lys	Gln	Asp	Leu
1565						1570					1575			
Val	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Ala	Ala	Trp	Asp	Gly
1580						1585					1590			
His	Ser	Glu	Val	Gln	Leu	Leu	Ala	Val	Pro	Pro	Gly	Glu	Arg	Ala
1595						1600					1605			
Arg	Asn	Ile	Gln	Thr	Leu	Pro	Gly	Ile	Phe	Lys	Thr	Lys	Asp	Gly
1610						1615					1620			
Asp	Ile	Gly	Ala	Val	Ala	Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly
1625						1630					1635			
Ser	Pro	Ile	Leu	Asp	Lys	Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly
1640						1645					1650			

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Arg Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Thr Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser	Gly	Phe	Asp	Trp	Val	Thr	Asp	Tyr	Ser	Gly	Lys	Thr	Val	Trp
1850						1855					1860			
Phe	Val	Pro	Ser	Val	Arg	Asn	Gly	Asn	Glu	Ile	Ala	Ala	Cys	Leu
1865						1870					1875			
Thr	Lys	Ala	Gly	Lys	Arg	Val	Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe
1880						1885					1890			
Glu	Thr	Glu	Phe	Gln	Lys	Thr	Lys	His	Gln	Glu	Trp	Asp	Phe	Val
1895						1900					1905			
Val	Thr	Thr	Asp	Ile	Ser	Glu	Met	Gly	Ala	Asn	Phe	Lys	Ala	Asp
1910						1915					1920			
Arg	Val	Ile	Asp	Ser	Arg	Arg	Cys	Leu	Lys	Pro	Val	Ile	Leu	Asp
1925						1930					1935			
Gly	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro	Met	Pro	Val	Thr	His	Ala
1940						1945					1950			
Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly	Arg	Asn	Pro	Asn	Lys
1955						1960					1965			
Pro	Gly	Asp	Glu	Tyr	Leu	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp
1970						1975					1980			
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn
1985						1990					1995			
Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu
2000						2005					2010			
Ala	Asp	Lys	Val	Ala	Ala	Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr
2015						2020					2025			
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu
2030						2035					2040			
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr
2045						2050					2055			

Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile
	2060					2065					2070			
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Arg	His	Gly	Glu
	2075					2080					2085			
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser
	2090					2095					2100			
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys
	2105					2110					2115			
Arg	Gly	Ala	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro
	2120					2125					2130			
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala
	2135					2140					2145			
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
	2150					2155					2160			
Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly
	2165					2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
	2180					2185					2190			
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
	2195					2200					2205			
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
	2210					2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
	2225					2230					2235			
Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met
	2240					2245					2250			

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Met Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Met Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Ile
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Val Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Ser Met Val
2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys His Lys Arg Pro Arg
2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys Gln Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser	Arg	Phe	Asp	Leu	Glu	Asn	Glu	Ala	Leu	Ile	Thr	Asn	Gln	Met
	3065					3070					3075			
Glu	Lys	Gly	His	Arg	Ala	Leu	Ala	Leu	Ala	Ile	Ile	Lys	Tyr	Thr
	3080					3085					3090			
Tyr	Gln	Asn	Lys	Val	Val	Lys	Val	Leu	Arg	Pro	Ala	Glu	Lys	Gly
	3095					3100					3105			
Lys	Thr	Val	Met	Asp	Ile	Ile	Ser	Arg	Gln	Asp	Gln	Arg	Gly	Ser
	3110					3115					3120			
Gly	Gln	Val	Val	Thr	Tyr	Ala	Leu	Asn	Thr	Phe	Thr	Asn	Leu	Val
	3125					3130					3135			
Val	Gln	Leu	Ile	Arg	Asn	Met	Glu	Ala	Glu	Glu	Val	Leu	Glu	Met
	3140					3145					3150			
Gln	Asp	Leu	Trp	Leu	Leu	Arg	Arg	Ser	Glu	Lys	Val	Thr	Asn	Trp
	3155					3160					3165			
Leu	Gln	Ser	Asn	Gly	Trp	Asp	Arg	Leu	Lys	Arg	Met	Ala	Val	Ser
	3170					3175					3180			
Gly	Asp	Asp	Cys	Val	Val	Lys	Pro	Ile	Asp	Asp	Arg	Phe	Ala	His
	3185					3190					3195			
Ala	Leu	Arg	Phe	Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Thr
	3200					3205					3210			
Gln	Glu	Trp	Lys	Pro	Ser	Thr	Gly	Trp	Asp	Asn	Trp	Glu	Glu	Val
	3215					3220					3225			
Pro	Phe	Cys	Ser	His	His	Phe	Asn	Lys	Leu	His	Leu	Lys	Asp	Gly
	3230					3235					3240			
Arg	Ser	Ile	Val	Val	Pro	Cys	Arg	His	Gln	Asp	Glu	Leu	Ile	Gly
	3245					3250					3255			
Arg	Ala	Arg	Val	Ser	Pro	Gly	Ala	Gly	Trp	Ser	Ile	Arg	Glu	Thr
	3260					3265					3270			

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

<210> 22
<211> 3419
<212> PRT
<213> Zika virus strain MR 766 polyprotein

<400> 22

Met Lys Asn Pro Lys Glu Glu Ile Arg Arg Ile Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Asn Pro Leu Gly Gly Leu Lys Arg

20

25

30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
 35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
 50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
 65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
 85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
 100 105 110

Ile Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
 115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
 130 135 140

Ile Ser Phe Ala Thr Thr Leu Gly Val Asn Lys Cys His Val Gln Ile
 145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
 165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
 180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
 195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
 210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
 225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Val Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Gly Tyr Glu Thr Asp Glu
435 440 445

Asp Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala

450

455

460

Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr
 465 470 475 480

Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His
 485 490 495

Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His
 500 505 510

Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu
 515 520 525

Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu
 530 535 540

Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu
 545 550 555 560

Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His Leu Lys
 565 570 575

Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser
 580 585 590

Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu Thr Leu
 595 600 605

His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro
 610 615 620

Cys Lys Ile Pro Val Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro
 625 630 635 640

Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu
 645 650 655

Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp Ser Tyr
 660 665 670

Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp His Arg
675 680 685

Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg Gly Ala
690 695 700

Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val
705 710 715 720

Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Ile His Gln Ile Phe Gly
725 730 735

Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser Gln Ile
740 745 750

Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys Asn Gly
755 760 765

Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile Phe Leu
770 775 780

Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val Asp Phe Ser Lys
785 790 795 800

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

Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser Pro Arg Arg Leu
820 825 830

Ala Ala Ala Val Lys Gln Ala Trp Glu Glu Gly Ile Cys Gly Ile Ser
835 840 845

Ser Val Ser Arg Met Glu Asn Ile Met Trp Lys Ser Val Glu Gly Glu
850 855 860

Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu Thr Val Val Val
865 870 875 880

Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln Arg Leu Pro Val

885

890

895

Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp Gly Lys Ser Tyr
 900 905 910

Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val Val Asp Gly Asp
 915 920 925

Thr Leu Lys Glu Cys Pro Leu Glu His Arg Ala Trp Asn Ser Phe Leu
 930 935 940

Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser Val Trp Leu Lys
 945 950 955 960

Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala Val Ile Gly Thr
 965 970 975

Ala Val Lys Gly Arg Glu Ala Ala His Ser Asp Leu Gly Tyr Trp Ile
 980 985 990

Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg Ala His Leu Ile
 995 1000 1005

Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His Thr Leu Trp Thr
 1010 1015 1020

Asp Gly Val Glu Glu Ser Asp Leu Ile Ile Pro Lys Ser Leu Ala
 1025 1030 1035

Gly Pro Leu Ser His His Asn Thr Arg Glu Gly Tyr Arg Thr Gln
 1040 1045 1050

Val Lys Gly Pro Trp His Ser Glu Glu Leu Glu Ile Arg Phe Glu
 1055 1060 1065

Glu Cys Pro Gly Thr Lys Val Tyr Val Glu Glu Thr Cys Gly Thr
 1070 1075 1080

Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser Gly Arg Val Ile
 1085 1090 1095

Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro Pro Leu Ser Phe
1100 1105 1110

Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Arg
1115 1120 1125

Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met Val Thr Ala Gly
1130 1135 1140

Ser Thr Asp His Met Asp His Phe Ser Leu Gly Val Leu Val Ile
1145 1150 1155

Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg Met Thr Thr Lys
1160 1165 1170

Ile Ile Met Ser Thr Ser Met Ala Val Leu Val Val Met Ile Leu
1175 1180 1185

Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu Val Ile Leu Met
1190 1195 1200

Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly Asp Val Ala His
1205 1210 1215

Leu Ala Leu Val Ala Ala Phe Lys Val Arg Pro Ala Leu Leu Val
1220 1225 1230

Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg Glu Ser Met Leu
1235 1240 1245

Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala Ile Ser Ala Leu
1250 1255 1260

Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe Ala Leu Ala Trp
1265 1270 1275

Leu Ala Ile Arg Ala Met Ala Val Pro Arg Thr Asp Asn Ile Ala
1280 1285 1290

Leu Pro Ile Leu Ala Ala Leu Thr Pro Leu Ala Arg Gly Thr Leu

1295

1300

1305

Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys Gly Gly Ile Met
1310 1315 1320

Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys Lys Asn Leu Pro
1325 1330 1335

Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg Val Val Asp Pro
1340 1345 1350

Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg Ser Gly Lys Arg
1355 1360 1365

Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val Gly Leu Ile Cys
1370 1375 1380

Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile Glu Met Ala Gly
1385 1390 1395

Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser Tyr Val Val Ser
1400 1405 1410

Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala Gly Asp Ile Thr
1415 1420 1425

Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser Pro Arg Leu Asp
1430 1435 1440

Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu Val Glu Glu Asp
1445 1450 1455

Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val Val Leu Met Ala
1460 1465 1470

Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe Ala Ala Gly Ala
1475 1480 1485

Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser Gly Ala Leu Trp
1490 1495 1500

Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly Glu Thr Thr Asp
1505 1510 1515

Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu Gly Ser Thr Gln
1520 1525 1530

Val Gly Val Gly Val Met Gln Glu Gly Val Phe His Thr Met Trp
1535 1540 1545

His Val Thr Lys Gly Ala Ala Leu Arg Ser Gly Glu Gly Arg Leu
1550 1555 1560

Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu Val Ser Tyr Cys
1565 1570 1575

Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly Leu Ser Glu Val
1580 1585 1590

Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala Arg Asn Ile Gln
1595 1600 1605

Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly Asp Ile Gly Ala
1610 1615 1620

Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly Ser Pro Ile Leu
1625 1630 1635

Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly Asn Gly Val Val
1640 1645 1650

Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr Gln Gly Lys Arg
1655 1660 1665

Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro Ser Met Leu Lys
1670 1675 1680

Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro Gly Ala Gly Lys
1685 1690 1695

Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu Ala Ile Lys Lys

1700	1705	1710
Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg Val Val Ala Ala 1715 1720 1725		
Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val Arg Tyr Met Thr 1730 1735 1740		
Thr Ala Val Asn Val Thr His Ser Gly Thr Glu Ile Val Asp Leu 1745 1750 1755		
Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu Gln Pro Ile Arg 1760 1765 1770		
Val Pro Asn Tyr Asn Leu Asn Ile Met Asp Glu Ala His Phe Thr 1775 1780 1785		
Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile Ser Thr Arg Val 1790 1795 1800		
Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr Ala Thr Pro Pro 1805 1810 1815		
Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser Pro Ile Met Asp 1820 1825 1830		
Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser Ser Gly Phe Asp 1835 1840 1845		
Trp Val Thr Asp His Ser Gly Lys Thr Val Trp Phe Val Pro Ser 1850 1855 1860		
Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu Thr Lys Ala Gly 1865 1870 1875		
Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe Glu Thr Glu Phe 1880 1885 1890		
Gln Lys Thr Lys Asn Gln Glu Trp Asp Phe Val Ile Thr Thr Asp 1895 1900 1905		

Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp Arg Val Ile Asp
1910 1915 1920

Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp Gly Glu Arg Val
1925 1930 1935

Ile Leu Ala Gly Pro Met Pro Val Thr His Ala Ser Ala Ala Gln
1940 1945 1950

Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys Pro Gly Asp Glu
1955 1960 1965

Tyr Met Tyr Gly Gly Gly Cys Ala Glu Thr Asp Glu Gly His Ala
1970 1975 1980

His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn Ile Tyr Leu Gln
1985 1990 1995

Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu Ala Asp Lys Val
2000 2005 2010

Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr Glu Gln Arg Lys
2015 2020 2025

Thr Phe Val Glu Leu Met Lys Arg Gly Asp Leu Pro Val Trp Leu
2030 2035 2040

Ala Tyr Gln Val Ala Ser Ala Gly Ile Thr Tyr Thr Asp Arg Arg
2045 2050 2055

Trp Cys Phe Asp Gly Thr Thr Asn Asn Thr Ile Met Glu Asp Ser
2060 2065 2070

Val Pro Ala Glu Val Trp Thr Lys Tyr Gly Glu Lys Arg Val Leu
2075 2080 2085

Lys Pro Arg Trp Met Asp Ala Arg Val Cys Ser Asp His Ala Ala
2090 2095 2100

Leu Lys Ser Phe Lys Glu Phe Ala Ala Gly Lys Arg Gly Ala Ala

2105

2110

2115

Leu Gly Val Met Glu Ala Leu Gly Thr Leu Pro Gly His Met Thr
2120 2125 2130

Glu Arg Phe Gln Glu Ala Ile Asp Asn Leu Ala Val Leu Met Arg
2135 2140 2145

Ala Glu Thr Gly Ser Arg Pro Tyr Lys Ala Ala Ala Ala Gln Leu
2150 2155 2160

Pro Glu Thr Leu Glu Thr Ile Met Leu Leu Gly Leu Leu Gly Thr
2165 2170 2175

Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg Asn Lys Gly Ile
2180 2185 2190

Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly Ala Ser Ala Trp
2195 2200 2205

Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg Ile Ala Cys Val
2210 2215 2220

Leu Ile Val Val Phe Leu Leu Leu Val Val Leu Ile Pro Glu Pro
2225 2230 2235

Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met Ala Ile Ile Ile
2240 2245 2250

Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr Ala Asn Glu Leu
2255 2260 2265

Gly Trp Leu Glu Arg Thr Lys Asn Asp Ile Ala His Leu Met Gly
2270 2275 2280

Arg Arg Glu Glu Gly Ala Thr Met Gly Phe Ser Met Asp Ile Asp
2285 2290 2295

Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala Ala Leu Thr Thr
2300 2305 2310

Leu Ile Thr Pro Ala Val Gln His Ala Val Thr Thr Ser Tyr Asn
2315 2320 2325

Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala Gly Val Leu Phe
2330 2335 2340

Gly Met Gly Lys Gly Met Pro Phe Met His Gly Asp Leu Gly Val
2345 2350 2355

Pro Leu Leu Met Met Gly Cys Tyr Ser Gln Leu Thr Pro Leu Thr
2360 2365 2370

Leu Ile Val Ala Ile Ile Leu Leu Val Ala His Tyr Met Tyr Leu
2375 2380 2385

Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala Ala Gln Lys Arg
2390 2395 2400

Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val Asp Gly Ile Val
2405 2410 2415

Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro Gln Val Glu Lys
2420 2425 2430

Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala Ile Ser Ser Ala
2435 2440 2445

Val Leu Leu Arg Thr Ala Trp Gly Trp Gly Glu Ala Gly Ala Leu
2450 2455 2460

Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly Ser Pro Asn Lys
2465 2470 2475

Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys Asn Ile Phe Arg
2480 2485 2490

Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr Thr Val Thr Arg
2495 2500 2505

Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly Thr Gly Glu Thr

2510

2515

2520

Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln Met Ser Ala Leu
 2525 2530 2535

Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr Glu Val Cys Arg
 2540 2545 2550

Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val Ala Thr Gly Gly
 2555 2560 2565

His Ala Val Ser Arg Gly Ser Ala Lys Ile Arg Trp Leu Glu Glu
 2570 2575 2580

Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Val Asp Leu Gly Cys
 2585 2590 2595

Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr Ile Arg Lys Val
 2600 2605 2610

Gln Glu Val Arg Gly Tyr Thr Lys Gly Gly Pro Gly His Glu Glu
 2615 2620 2625

Pro Met Leu Val Gln Ser Tyr Gly Trp Asn Ile Val Arg Leu Lys
 2630 2635 2640

Ser Gly Val Asp Val Phe His Met Ala Ala Glu Pro Cys Asp Thr
 2645 2650 2655

Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser Pro Glu Val Glu
 2660 2665 2670

Glu Thr Arg Thr Leu Arg Val Leu Ser Met Val Gly Asp Trp Leu
 2675 2680 2685

Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val Leu Cys Pro Tyr
 2690 2695 2700

Thr Ser Thr Met Met Glu Thr Met Glu Arg Leu Gln Arg Arg His
 2705 2710 2715

Gly Gly Gly Leu Val Arg Val Pro Leu Cys Arg Asn Ser Thr His
2720 2725 2730

Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn Ile Ile Lys Ser
2735 2740 2745

Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg Met Asp Gly Pro
2750 2755 2760

Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn Leu Gly Ser Gly
2765 2770 2775

Thr Arg Ala Val Ala Ser Cys Ala Glu Ala Pro Asn Met Lys Ile
2780 2785 2790

Ile Gly Arg Arg Ile Glu Arg Ile Arg Asn Glu His Ala Glu Thr
2795 2800 2805

Trp Phe Leu Asp Glu Asn His Pro Tyr Arg Thr Trp Ala Tyr His
2810 2815 2820

Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala Ser Ser Leu Val
2825 2830 2835

Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp Asp Val Val Thr
2840 2845 2850

Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr Pro Tyr Gly Gln
2855 2860 2865

Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg Val Pro Asp Pro
2870 2875 2880

Gln Glu Gly Thr Arg Gln Val Met Asn Ile Val Ser Ser Trp Leu
2885 2890 2895

Trp Lys Glu Leu Gly Lys Arg Lys Arg Pro Arg Val Cys Thr Lys
2900 2905 2910

Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala Ala Leu Gly Ala

2915						2920						2925			
Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala	Val	Glu	Ala	Val	
2930						2935						2940			
Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Arg	Glu	Arg	Glu	His	
2945						2950					2955				
His	Leu	Arg	Gly	Glu	Cys	His	Ser	Cys	Val	Tyr	Asn	Met	Met	Gly	
2960						2965					2970				
Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys	Ala	Lys	Gly	Ser	
2975						2980					2985				
Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg	Phe	Leu	Glu	Phe	
2990						2995					3000				
Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp	Met	Gly	Arg	Glu	
3005						3010					3015				
Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu	Gln	Arg	Leu	Gly	
3020						3025					3030				
Tyr	Ile	Leu	Glu	Glu	Met	Asn	Arg	Ala	Pro	Gly	Gly	Lys	Met	Tyr	
3035						3040					3045				
Ala	Asp	Asp	Thr	Ala	Gly	Trp	Asp	Thr	Arg	Ile	Ser	Lys	Phe	Asp	
3050						3055					3060				
Leu	Glu	Asn	Glu	Ala	Leu	Ile	Thr	Asn	Gln	Met	Glu	Glu	Gly	His	
3065						3070					3075				
Arg	Thr	Leu	Ala	Leu	Ala	Val	Ile	Lys	Tyr	Thr	Tyr	Gln	Asn	Lys	
3080						3085					3090				
Val	Val	Lys	Val	Leu	Arg	Pro	Ala	Glu	Gly	Gly	Lys	Thr	Val	Met	
3095						3100					3105				
Asp	Ile	Ile	Ser	Arg	Gln	Asp	Gln	Arg	Gly	Ser	Gly	Gln	Val	Val	
3110						3115					3120				

Thr	Tyr	Ala	Leu	Asn	Thr	Phe	Thr	Asn	Leu	Val	Val	Gln	Leu	Ile
3125						3130					3135			
Arg	Asn	Met	Glu	Ala	Glu	Glu	Val	Leu	Glu	Met	Gln	Asp	Leu	Trp
3140						3145					3150			
Leu	Leu	Arg	Lys	Pro	Glu	Lys	Val	Thr	Arg	Trp	Leu	Gln	Ser	Asn
3155						3160					3165			
Gly	Trp	Asp	Arg	Leu	Lys	Arg	Met	Ala	Val	Ser	Gly	Asp	Asp	Cys
3170						3175					3180			
Val	Val	Lys	Pro	Ile	Asp	Asp	Arg	Phe	Ala	His	Ala	Leu	Arg	Phe
3185						3190					3195			
Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Thr	Gln	Glu	Trp	Lys
3200						3205					3210			
Pro	Ser	Thr	Gly	Trp	Ser	Asn	Trp	Glu	Glu	Val	Pro	Phe	Cys	Ser
3215						3220					3225			
His	His	Phe	Asn	Lys	Leu	Tyr	Leu	Lys	Asp	Gly	Arg	Ser	Ile	Val
3230						3235					3240			
Val	Pro	Cys	Arg	His	Gln	Asp	Glu	Leu	Ile	Gly	Arg	Ala	Arg	Val
3245						3250					3255			
Ser	Pro	Gly	Ala	Gly	Trp	Ser	Ile	Arg	Glu	Thr	Ala	Cys	Leu	Ala
3260						3265					3270			
Lys	Ser	Tyr	Ala	Gln	Met	Trp	Gln	Leu	Leu	Tyr	Phe	His	Arg	Arg
3275						3280					3285			
Asp	Leu	Arg	Leu	Met	Ala	Asn	Ala	Ile	Cys	Ser	Ala	Val	Pro	Val
3290						3295					3300			
Asp	Trp	Val	Pro	Thr	Gly	Arg	Thr	Thr	Trp	Ser	Ile	His	Gly	Lys
3305						3310					3315			
Gly	Glu	Trp	Met	Thr	Thr	Glu	Asp	Met	Leu	Met	Val	Trp	Asn	Arg

3320

3325

3330

Val Trp Ile Glu Glu Asn Asp His Met Glu Asp Lys Thr Pro Val
 3335 3340 3345

Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys Arg Glu Asp Leu
 3350 3355 3360

Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg Thr Thr Trp Ala
 3365 3370 3375

Glu Asn Ile Lys Asp Thr Val Asn Met Val Arg Arg Ile Ile Gly
 3380 3385 3390

Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr Gln Val Arg Tyr
 3395 3400 3405

Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
 3410 3415

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<211> 3423

<212> PRT

<213> Zika virus strain BeH815744 polyprotein

<400> 23

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
 1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
 20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
 35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
 50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
 65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

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

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Arg Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Thr Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro	Gly	Asp	Glu	Tyr	Leu	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp
1970						1975					1980			
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn
1985						1990					1995			
Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu
2000						2005					2010			
Ala	Asp	Lys	Val	Ala	Ala	Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr
2015						2020					2025			
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu
2030						2035					2040			
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr
2045						2050					2055			
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile
2060						2065					2070			
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Arg	His	Gly	Glu
2075						2080					2085			
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser
2090						2095					2100			
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys
2105						2110					2115			
Arg	Gly	Ala	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro
2120						2125					2130			
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala
2135						2140					2145			
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
2150						2155					2160			

Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly
2165						2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
2180						2185					2190			
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
2195						2200					2205			
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
2210						2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
2225						2230					2235			
Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met
2240						2245					2250			
Ala	Ile	Ile	Ile	Met	Val	Ala	Val	Gly	Leu	Leu	Gly	Leu	Ile	Thr
2255						2260					2265			
Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Ser	Asp	Leu	Ser
2270						2275					2280			
His	Leu	Met	Gly	Arg	Arg	Glu	Glu	Gly	Ala	Thr	Ile	Gly	Phe	Ser
2285						2290					2295			
Met	Asp	Ile	Asp	Leu	Arg	Pro	Ala	Ser	Ala	Trp	Ala	Ile	Tyr	Ala
2300						2305					2310			
Ala	Leu	Thr	Thr	Phe	Ile	Thr	Pro	Ala	Val	Gln	His	Ala	Val	Thr
2315						2320					2325			
Thr	Ser	Tyr	Asn	Asn	Tyr	Ser	Leu	Met	Ala	Met	Ala	Thr	Gln	Ala
2330						2335					2340			
Gly	Val	Leu	Phe	Gly	Met	Gly	Lys	Gly	Met	Pro	Phe	Tyr	Ala	Trp
2345						2350					2355			
Asp	Phe	Gly	Val	Pro	Leu	Leu	Met	Ile	Gly	Cys	Tyr	Ser	Gln	Leu
2360						2365					2370			

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Ile
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Val Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asp
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Ser Met Val
2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys His Lys Arg Pro Arg
2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys Gln Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

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<211> 3423
<212> PRT
<213> Zika virus strain BeH819966 polyprotein

<400> 24

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly

355

360

365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
 370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
 385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
 405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
 420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
 435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
 450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
 465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
 485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
 500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
 515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
 530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
 545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
 565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val

785		790		795		800									
Asp	Phe	Ser	Lys	Lys	Glu	Thr	Arg	Cys	Gly	Thr	Gly	Val	Phe	Val	Tyr
			805						810					815	
Asn	Asp	Val	Glu	Ala	Trp	Arg	Asp	Arg	Tyr	Lys	Tyr	His	Pro	Asp	Ser
		820						825					830		
Pro	Arg	Arg	Leu	Ala	Ala	Ala	Val	Lys	Gln	Ala	Trp	Glu	Asp	Gly	Ile
		835					840					845			
Cys	Gly	Ile	Ser	Ser	Val	Ser	Arg	Met	Glu	Asn	Ile	Met	Trp	Arg	Ser
	850					855					860				
Val	Glu	Gly	Glu	Leu	Asn	Ala	Ile	Leu	Glu	Glu	Asn	Gly	Val	Gln	Leu
865					870					875					880
Thr	Val	Val	Val	Gly	Ser	Val	Lys	Asn	Pro	Met	Trp	Arg	Gly	Pro	Gln
				885					890					895	
Arg	Leu	Pro	Val	Pro	Val	Asn	Glu	Leu	Pro	His	Gly	Trp	Lys	Ala	Trp
			900					905					910		
Gly	Lys	Ser	Tyr	Phe	Val	Arg	Ala	Ala	Lys	Thr	Asn	Asn	Ser	Phe	Val
		915					920					925			
Val	Asp	Gly	Asp	Thr	Leu	Lys	Glu	Cys	Pro	Leu	Lys	His	Arg	Ala	Trp
	930					935					940				
Asn	Ser	Phe	Leu	Val	Glu	Asp	His	Gly	Phe	Gly	Val	Phe	His	Thr	Ser
945					950					955					960
Val	Trp	Leu	Lys	Val	Arg	Glu	Asp	Tyr	Ser	Leu	Glu	Cys	Asp	Pro	Ala
				965					970					975	
Val	Ile	Gly	Thr	Ala	Val	Lys	Gly	Lys	Glu	Ala	Val	His	Ser	Asp	Leu
			980					985					990		
Gly	Tyr	Trp	Ile	Glu	Ser	Glu	Lys	Asn	Asp	Thr	Trp	Arg	Leu	Lys	Arg
		995					1000					1005			

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Ile Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Ala Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly

1205						1210						1215			
Asp	Val	Ala	His	Leu	Ala	Leu	Ile	Ala	Ala	Phe	Lys	Val	Arg	Pro	
1220						1225					1230				
Ala	Leu	Leu	Val	Ser	Phe	Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg	
1235						1240					1245				
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala	
1250						1255					1260				
Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Ile	Asn	Gly	Phe	
1265						1270					1275				
Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Val	Val	Pro	Arg	Thr	
1280						1285					1290				
Asp	Asn	Ile	Thr	Leu	Ala	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala	
1295						1300					1305				
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys	
1310						1315					1320				
Gly	Gly	Phe	Met	Leu	Leu	Ser	Leu	Lys	Gly	Lys	Gly	Ser	Val	Lys	
1325						1330					1335				
Lys	Asn	Leu	Pro	Phe	Val	Met	Ala	Leu	Gly	Leu	Thr	Ala	Val	Arg	
1340						1345					1350				
Leu	Val	Asp	Pro	Ile	Asn	Val	Val	Gly	Leu	Leu	Leu	Leu	Thr	Arg	
1355						1360					1365				
Ser	Gly	Lys	Arg	Ser	Trp	Pro	Pro	Ser	Glu	Val	Leu	Thr	Ala	Val	
1370						1375					1380				
Gly	Leu	Ile	Cys	Ala	Leu	Ala	Gly	Gly	Phe	Ala	Lys	Ala	Asp	Ile	
1385						1390					1395				
Glu	Met	Ala	Gly	Pro	Met	Ala	Ala	Val	Gly	Leu	Leu	Ile	Val	Ser	
1400						1405					1410				

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly

1610						1615						1620			
Asp	Ile	Gly	Ala	Val	Ala	Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly	
1625						1630					1635				
Ser	Pro	Ile	Leu	Asp	Lys	Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly	
1640						1645					1650				
Asn	Gly	Val	Val	Ile	Lys	Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr	
1655						1660					1665				
Gln	Gly	Arg	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro	
1670						1675					1680				
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro	
1685						1690					1695				
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu	
1700						1705					1710				
Ala	Ile	Lys	Thr	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg	
1715						1720					1725				
Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro	Val	
1730						1735					1740				
Arg	Tyr	Met	Thr	Thr	Ala	Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu	
1745						1750					1755				
Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Leu	
1760						1765					1770				
Gln	Pro	Ile	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Tyr	Ile	Met	Asp	Glu	
1775						1780					1785				
Ala	His	Phe	Thr	Asp	Pro	Ser	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile	
1790						1795					1800				
Ser	Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr	
1805						1810					1815				

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Asp His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu
2000 2005 2010

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr

2015						2020						2025					
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu			
2030						2035						2040					
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr			
2045						2050						2055					
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile			
2060						2065						2070					
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Arg	His	Gly	Glu			
2075						2080						2085					
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser			
2090						2095						2100					
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys			
2105						2110						2115					
Arg	Gly	Ala	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro			
2120						2125						2130					
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala			
2135						2140						2145					
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala			
2150						2155						2160					
Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly			
2165						2170						2175					
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg			
2180						2185						2190					
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly			
2195						2200						2205					
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg			
2210						2215						2220					

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Ile Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro

2420

2425

2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Ile
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Val Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala

2825						2830						2835			
Ser	Ser	Leu	Ile	Asn	Gly	Val	Val	Arg	Leu	Leu	Ser	Lys	Pro	Trp	
2840						2845					2850				
Asp	Val	Val	Thr	Gly	Val	Thr	Gly	Ile	Ala	Met	Thr	Asp	Thr	Thr	
2855						2860					2865				
Pro	Tyr	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr	Arg	
2870						2875					2880				
Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Val	Met	Ser	Met	Val	
2885						2890					2895				
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	His	Lys	Arg	Pro	Arg	
2900						2905					2910				
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala	
2915						2920					2925				
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala	
2930						2935					2940				
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys	
2945						2950					2955				
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	Gln	Ser	Cys	Val	Tyr	
2960						2965					2970				
Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys	
2975						2980					2985				
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg	
2990						2995					3000				
Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp	
3005						3010					3015				
Met	Gly	Arg	Glu	Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu	
3020						3025					3030				

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly

3230

3235

3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

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<211> 3423

<212> PRT

<213> Zika virus strain BeH819015 polyprotein

<400> 25

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
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Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Ile Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Ala Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
1205 1210 1215

Asp Val Ala His Leu Ala Leu Ile Ala Ala Phe Lys Val Arg Pro
1220 1225 1230

Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
1235 1240 1245

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
1250 1255 1260

Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe
1265 1270 1275

Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Val Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Thr Leu Ala Ile Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
1310 1315 1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Arg Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Thr Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr	Lys	Ala	Gly	Lys	Arg	Val	Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe
1880						1885					1890			
Glu	Thr	Glu	Phe	Gln	Lys	Thr	Lys	His	Gln	Glu	Trp	Asp	Phe	Val
1895						1900					1905			
Val	Thr	Thr	Asp	Ile	Ser	Glu	Met	Gly	Ala	Asn	Phe	Lys	Ala	Asp
1910						1915					1920			
Arg	Val	Ile	Asp	Ser	Arg	Arg	Cys	Leu	Lys	Pro	Val	Ile	Leu	Asp
1925						1930					1935			
Gly	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro	Met	Pro	Val	Thr	His	Ala
1940						1945					1950			
Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly	Arg	Asn	Pro	Asn	Lys
1955						1960					1965			
Pro	Gly	Asp	Glu	Tyr	Leu	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp
1970						1975					1980			
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn
1985						1990					1995			
Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu
2000						2005					2010			
Ala	Asp	Lys	Val	Ala	Ala	Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr
2015						2020					2025			
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu
2030						2035					2040			
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr
2045						2050					2055			
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile
2060						2065					2070			

Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Arg	His	Gly	Glu
	2075					2080					2085			
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser
	2090					2095					2100			
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys
	2105					2110					2115			
Arg	Gly	Ala	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro
	2120					2125					2130			
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala
	2135					2140					2145			
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
	2150					2155					2160			
Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly
	2165					2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
	2180					2185					2190			
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
	2195					2200					2205			
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
	2210					2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
	2225					2230					2235			
Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met
	2240					2245					2250			
Ala	Ile	Ile	Ile	Met	Val	Ala	Val	Gly	Leu	Leu	Gly	Leu	Ile	Thr
	2255					2260					2265			
Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Ser	Asp	Leu	Ser
	2270					2275					2280			

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Ile Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser	Thr	Ala	Thr	Ser	Leu	Cys
	2480					2485					2490			
Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr
	2495					2500					2505			
Thr	Val	Thr	Arg	Asn	Ala	Gly	Leu	Val	Lys	Arg	Arg	Gly	Gly	Gly
	2510					2515					2520			
Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln
	2525					2530					2535			
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
	2540					2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
	2555					2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
	2570					2575					2580			
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	Tyr	Gly	Lys	Val	Ile
	2585					2590					2595			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
	2600					2605					2610			
Ile	Arg	Lys	Val	Gln	Glu	Val	Lys	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
	2615					2620					2625			
Gly	His	Glu	Glu	Pro	Val	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile
	2630					2635					2640			
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu
	2645					2650					2655			
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser
	2660					2665					2670			
Pro	Glu	Val	Glu	Glu	Ala	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val
	2675					2680					2685			

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Val	Met	Ser	Met	Val
2885						2890					2895			
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	His	Lys	Arg	Pro	Arg
2900						2905					2910			
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala
2915						2920					2925			
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala
2930						2935					2940			
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys
2945						2950					2955			
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	Gln	Ser	Cys	Val	Tyr
2960						2965					2970			
Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys
2975						2980					2985			
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg
2990						2995					3000			
Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp
3005						3010					3015			
Met	Gly	Arg	Glu	Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu
3020						3025					3030			
Gln	Arg	Leu	Gly	Tyr	Val	Leu	Glu	Glu	Met	Ser	Arg	Ile	Pro	Gly
3035						3040					3045			
Gly	Arg	Met	Tyr	Ala	Asp	Asp	Thr	Ala	Gly	Trp	Asp	Thr	Arg	Ile
3050						3055					3060			
Ser	Arg	Phe	Asp	Leu	Glu	Asn	Glu	Ala	Leu	Ile	Thr	Asn	Gln	Met
3065						3070					3075			
Glu	Lys	Gly	His	Arg	Ala	Leu	Ala	Leu	Ala	Ile	Ile	Lys	Tyr	Thr
3080						3085					3090			

Tyr	Gln	Asn	Lys	Val	Val	Lys	Val	Leu	Arg	Pro	Ala	Glu	Lys	Gly
3095						3100					3105			
Lys	Thr	Val	Met	Asp	Ile	Ile	Ser	Arg	Gln	Asp	Gln	Arg	Gly	Ser
3110						3115					3120			
Gly	Gln	Val	Val	Thr	Tyr	Ala	Leu	Asn	Thr	Phe	Thr	Asn	Leu	Val
3125						3130					3135			
Val	Gln	Leu	Ile	Arg	Asn	Met	Glu	Ala	Glu	Glu	Val	Leu	Glu	Met
3140						3145					3150			
Gln	Asp	Leu	Trp	Leu	Leu	Arg	Arg	Ser	Glu	Lys	Val	Thr	Asn	Trp
3155						3160					3165			
Leu	Gln	Ser	Asn	Gly	Trp	Asp	Arg	Leu	Lys	Arg	Met	Ala	Val	Ser
3170						3175					3180			
Gly	Asp	Asp	Cys	Val	Val	Lys	Pro	Ile	Asp	Asp	Arg	Phe	Ala	His
3185						3190					3195			
Ala	Leu	Arg	Phe	Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Thr
3200						3205					3210			
Gln	Glu	Trp	Lys	Pro	Ser	Thr	Gly	Trp	Asp	Asn	Trp	Glu	Glu	Val
3215						3220					3225			
Pro	Phe	Cys	Ser	His	His	Phe	Asn	Lys	Leu	His	Leu	Lys	Asp	Gly
3230						3235					3240			
Arg	Ser	Ile	Val	Val	Pro	Cys	Arg	His	Gln	Asp	Glu	Leu	Ile	Gly
3245						3250					3255			
Arg	Ala	Arg	Val	Ser	Pro	Gly	Ala	Gly	Trp	Ser	Ile	Arg	Glu	Thr
3260						3265					3270			
Ala	Cys	Leu	Ala	Lys	Ser	Tyr	Ala	Gln	Met	Trp	Gln	Leu	Leu	Tyr
3275						3280					3285			

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

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<211> 3423
<212> PRT
<213> Zika virus isolate Z1106033 polyprotein

<400> 26

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
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Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Thr Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr

260

265

270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
 275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
 290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
 305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
 325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
 340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
 355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
 370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
 385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
 405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
 420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
 435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
 450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
 465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr

690

695

700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
 705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
 725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
 740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
 755 760 765

Ala Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
 770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
 785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
 805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
 820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
 835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
 850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
 865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
 885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
 900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu

1115						1120						1125			
Ile	Arg	Pro	Arg	Lys	Glu	Pro	Glu	Ser	Asn	Leu	Val	Arg	Ser	Met	
1130						1135					1140				
Val	Thr	Ala	Gly	Ser	Thr	Asp	His	Met	Asp	His	Phe	Ser	Leu	Gly	
1145						1150					1155				
Val	Leu	Val	Ile	Leu	Leu	Met	Val	Gln	Glu	Gly	Leu	Lys	Lys	Arg	
1160						1165					1170				
Met	Thr	Thr	Lys	Ile	Ile	Ile	Ser	Thr	Ser	Met	Ala	Val	Leu	Val	
1175						1180					1185				
Ala	Met	Ile	Leu	Gly	Gly	Phe	Ser	Met	Ser	Asp	Leu	Ala	Lys	Leu	
1190						1195					1200				
Ala	Ile	Leu	Met	Gly	Ala	Thr	Phe	Ala	Glu	Met	Asn	Thr	Gly	Gly	
1205						1210					1215				
Asp	Val	Ala	His	Leu	Ala	Leu	Ile	Ala	Ala	Phe	Lys	Val	Arg	Pro	
1220						1225					1230				
Ala	Leu	Leu	Val	Ser	Phe	Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg	
1235						1240					1245				
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala	
1250						1255					1260				
Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Ile	Asn	Gly	Phe	
1265						1270					1275				
Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Val	Val	Pro	Arg	Thr	
1280						1285					1290				
Asp	Asn	Ile	Thr	Leu	Ala	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala	
1295						1300					1305				
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys	
1310						1315					1320				

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu

1520						1525						1530			
Gly	Ser	Thr	Gln	Val	Gly	Val	Gly	Val	Met	Gln	Glu	Gly	Val	Phe	
1535						1540					1545				
His	Thr	Met	Trp	His	Val	Thr	Lys	Gly	Ser	Ala	Leu	Arg	Ser	Gly	
1550						1555					1560				
Glu	Gly	Arg	Leu	Asp	Pro	Tyr	Trp	Gly	Asp	Val	Lys	Gln	Asp	Leu	
1565						1570					1575				
Val	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Ala	Ala	Trp	Asp	Gly	
1580						1585					1590				
His	Ser	Glu	Val	Gln	Leu	Leu	Ala	Val	Pro	Pro	Gly	Glu	Arg	Ala	
1595						1600					1605				
Arg	Asn	Ile	Gln	Thr	Leu	Pro	Gly	Ile	Phe	Lys	Thr	Lys	Asp	Gly	
1610						1615					1620				
Asp	Ile	Gly	Ala	Val	Ala	Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly	
1625						1630					1635				
Ser	Pro	Ile	Leu	Asp	Lys	Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly	
1640						1645					1650				
Asn	Gly	Val	Val	Ile	Lys	Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr	
1655						1660					1665				
Gln	Gly	Arg	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro	
1670						1675					1680				
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro	
1685						1690					1695				
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu	
1700						1705					1710				
Ala	Ile	Lys	Thr	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg	
1715						1720					1725				

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp

1925						1930						1935			
Gly	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro	Met	Pro	Val	Thr	His	Ala	
1940						1945					1950				
Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly	Arg	Asn	Pro	Asn	Lys	
1955						1960					1965				
Pro	Gly	Asp	Glu	Tyr	Leu	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp	
1970						1975					1980				
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn	
1985						1990					1995				
Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu	
2000						2005					2010				
Ala	Asp	Lys	Val	Ala	Ala	Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr	
2015						2020					2025				
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu	
2030						2035					2040				
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr	
2045						2050					2055				
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile	
2060						2065					2070				
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Arg	His	Gly	Glu	
2075						2080					2085				
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser	
2090						2095					2100				
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys	
2105						2110					2115				
Arg	Gly	Ala	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro	
2120						2125					2130				

Gly His Met Thr Glu Arg Phe Gln Glu Ala Ile Asp Asn Leu Ala
2135 2140 2145

Val Leu Met Arg Ala Glu Thr Gly Ser Arg Pro Tyr Lys Ala Ala
2150 2155 2160

Ala Ala Gln Leu Pro Glu Thr Leu Glu Thr Ile Met Leu Leu Gly
2165 2170 2175

Leu Leu Gly Thr Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg
2180 2185 2190

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
2210 2215 2220

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Ile Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala

2330

2335

2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
 2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
 2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
 2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
 2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
 2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
 2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
 2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
 2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
 2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
 2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
 2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
 2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
 2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Ile
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Val Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn

2735

2740

2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
 2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
 2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
 2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
 2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
 2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
 2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
 2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
 2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
 2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Ser Met Val
 2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys His Lys Arg Pro Arg
 2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
 2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
 2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys Gln Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met

3140

3145

3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
 3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
 3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
 3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
 3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
 3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
 3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
 3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
 3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
 3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
 3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
 3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
 3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
 3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

<210> 27

<211> 403

<212> PRT

<213> sE of SEQ ID NO:1/14

<400> 27

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 28
<211> 403
<212> PRT
<213> sE of SEQ ID NO:2/15

<400> 28

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu

305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 29
<211> 403
<212> PRT
<213> sE of SEQ ID NO:3/16

<400> 29

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
 20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
 35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
 50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 30

<211> 403

<212> PRT

<213> sE of SEQ ID NO:4/17

<400> 30

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala

65

70

75

80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 31
<211> 403
<212> PRT
<213> sE of SEQ ID NO:5/18

<400> 31

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 32
<211> 403
<212> PRT
<213> sE of SEQ ID NO:6/19

<400> 32

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Thr Val Asn Asp Ile Gly Tyr Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala

260

265

270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Lys Leu Phe Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Ile Pro Val Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser

<210> 33

<211> 399

<212> PRT

<213> sE of SEQ ID NO:7/20

<400> 33

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
 1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
 20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Gly Tyr Glu Thr Asp Glu Asp Arg
145 150 155 160

Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu
165 170 175

Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu
180 185 190

Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu
195 200 205

Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly
210 215 220

Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu
225 230 235 240

Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser
245 250 255

Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu
260 265 270

Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His Leu Lys Cys Arg
275 280 285

Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys
290 295 300

Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu Thr Leu His Gly
305 310 315 320

Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys
325 330 335

Ile Pro Val Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly
340 345 350

Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser
355 360 365

Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp Ser Tyr Ile Val
370 375 380

Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp His Arg Ser
385 390 395

<210> 34
<211> 403
<212> PRT
<213> sE of SEQ ID NO:8/21

<400> 34

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Ile Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr

35

40

45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
 50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
 65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
 85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
 100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
 115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
 130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
 145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
 165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
 180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
 195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 35

<211> 399

<212> PRT

<213> sE of SEQ ID NO:9/22

<400> 35

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Gly Tyr Glu Thr Asp Glu Asp Arg
145 150 155 160

Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu
165 170 175

Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu
180 185 190

Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu
195 200 205

Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly
210 215 220

Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu
225 230 235 240

Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser
245 250 255

Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu
260 265 270

Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His Leu Lys Cys Arg
275 280 285

Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys
290 295 300

Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu Thr Leu His Gly
305 310 315 320

Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys
325 330 335

Ile Pro Val Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly
340 345 350

Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser
355 360 365

Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp Ser Tyr Ile Val
370 375 380

Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp His Arg Ser
385 390 395

<210> 36
<211> 403
<212> PRT
<213> sE of SEQ ID NO:10/23

<400> 36

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val

245

250

255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
 260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser

<210> 37

<211> 403

<212> PRT

<213> sE of SEQ ID NO:11/24

<400> 37

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
 1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 38

<211> 403

<212> PRT

<213> sE of SEQ ID NO:12/25

<400> 38

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser

1	5	10	15
Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr	20	25	30
Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr	35	40	45
Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser	50	55	60
Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala	65	70	75
Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu	85	90	95
Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser	100	105	110
Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys	115	120	125
Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His	130	135	140
Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr	145	150	155
Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala	165	170	175
Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro	180	185	190
Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn	195	200	205
Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro	210	215	220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 39

<211> 403

<212> PRT

<213> sE of SEQ ID NO:13/26

<400> 39

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 40

<211> 504

<212> PRT

<213> E protein + stem-anchor of SEQ ID NO:1/14

<400> 40

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn

195

200

205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
 260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
 405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 41
<211> 504
<212> PRT
<213> E protein + stem-anchor of SEQ ID NO:2/15

<400> 41

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 42
<211> 504

<212> PRT

<213> E protein + stem-anchor of SEQ ID NO:3/16

<400> 42

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn

195

200

205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
 260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
 405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 43
<211> 504
<212> PRT
<213> E protein + stem-anchor of SEQ ID NO:4/17

<400> 43

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 44
<211> 504

<212> PRT

<213> E protein + stem-anchor of SEQ ID NO:5/18

<400> 44

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn

195

200

205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
 260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
 405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 45
<211> 504
<212> PRT
<213> E protein + stem-anchor of SEQ ID NO:6/19

<400> 45

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Thr Val Asn Asp Ile Gly Tyr Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Lys Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Ile Pro Val Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 46
<211> 500

<212> PRT

<213> E protein + stem-anchor of SEQ ID NO:7/20

<400> 46

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Gly Tyr Glu Thr Asp Glu Asp Arg
145 150 155 160

Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu
165 170 175

Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu
180 185 190

Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu

195

200

205

Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly
 210 215 220

Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu
 225 230 235 240

Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser
 245 250 255

Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu
 260 265 270

Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His Leu Lys Cys Arg
 275 280 285

Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys
 290 295 300

Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu Thr Leu His Gly
 305 310 315 320

Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys
 325 330 335

Ile Pro Val Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly
 340 345 350

Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser
 355 360 365

Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp Ser Tyr Ile Val
 370 375 380

Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp His Arg Ser Gly
 385 390 395 400

Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg Gly Ala Lys Arg
 405 410 415

Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly
420 425 430

Val Phe Asn Ser Leu Gly Lys Gly Ile His Gln Ile Phe Gly Ala Ala
435 440 445

Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser Gln Ile Leu Ile
450 455 460

Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys Asn Gly Ser Ile
465 470 475 480

Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile Phe Leu Ser Thr
485 490 495

Ala Val Ser Ala
500

<210> 47
<211> 504
<212> PRT
<213> E protein + stem-anchor of SEQ ID NO:8/21

<400> 47

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Ile Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 48

<211> 500

<212> PRT

<213> E protein + stem-anchor of SEQ ID NO:9/22

<400> 48

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Gly Tyr Glu Thr Asp Glu Asp Arg
145 150 155 160

Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu
165 170 175

Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu
180 185 190

Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu

195

200

205

Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly
 210 215 220

Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu
 225 230 235 240

Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser
 245 250 255

Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu
 260 265 270

Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His Leu Lys Cys Arg
 275 280 285

Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys
 290 295 300

Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu Thr Leu His Gly
 305 310 315 320

Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys
 325 330 335

Ile Pro Val Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly
 340 345 350

Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser
 355 360 365

Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp Ser Tyr Ile Val
 370 375 380

Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp His Arg Ser Gly
 385 390 395 400

Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg Gly Ala Lys Arg
 405 410 415

Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly
420 425 430

Val Phe Asn Ser Leu Gly Lys Gly Ile His Gln Ile Phe Gly Ala Ala
435 440 445

Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser Gln Ile Leu Ile
450 455 460

Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys Asn Gly Ser Ile
465 470 475 480

Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile Phe Leu Ser Thr
485 490 495

Ala Val Ser Ala
500

<210> 49
<211> 504
<212> PRT
<213> E protein + stem-anchor of SEQ ID NO:10/23

<400> 49

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 50

<211> 504

<212> PRT

<213> E protein + stem-anchor of SEQ ID NO:11/24

<400> 50

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn

195

200

205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
 260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
 405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 51
<211> 504
<212> PRT
<213> E protein + stem-anchor of SEQ ID NO:12/25

<400> 51

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 52
<211> 504

<212> PRT

<213> E protein + stem-anchor of SEQ ID NO:13/26

<400> 52

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn

195

200

205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
 260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
 405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Ala Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 53
<211> 1773
<212> DNA
<213> Insert sE no codon optimization

<400> 53
agacgaggcg cagatactag tgtcgggaatt gttggcctcc tgctgaccac agctatggca 60
gcggaggtca ctagacgtgg gagtgcatac tatatgtact tggacagaaa cgatgctggg 120
gaggccatat cttttccaac cacattgggg atgaataagt gttatataca gatcatggat 180
cttggacaca tgtgtgatgc caccatgagc tatgaatgcc ctatgctgga tgaggggggtg 240
gaaccagatg acgtcgattg ttggtgcaac acgacgtcaa cttgggttgt gtacggaacc 300
tgccatcaca aaaaaggtga agcacggaga tctagaagag ctgtgacgct cccctcccat 360
tccactagga agctgcaaac gcggtcgcaa acctggttgg aatcaagaga atacacaaag 420
cacttgatta gagtgcaaaa ttggatattt aggaaccctg gcttcgcgtt agcagcagct 480
gccatcgctt ggcttttggg aagctcaacg agccaaaaag tcatatactt ggtcatgata 540
ctgctgattg ccccggcata cagcatcagg tgcataggag tcagcaatag ggactttgtg 600
gaaggatatgt caggtgggac ctgggttgat gttgtcttgg aacatggagg ttgtgtcacc 660
gtaatggcac aggacaaacc gactgtcgac atagagctgg ttacaacaac agtcagcaac 720

atggcggagg taagatccta ctgctatgag gcatcaatat cagacatggc ttcggacagc	780
cgctgcccac cacaaggtga agcctacctt gacaagcaat cagacactca atatgtctgc	840
aaaagaacgt tagtggacag aggctgggga aatggatgtg gacttttttg caaagggagc	900
ctggtgacat gcgctaagtt tgcattgctcc aagaaaatga ccgggaagag catccagcca	960
gagaatctgg agtaccggat aatgctgtca gttcatggct cccagcacag tgggatgatt	1020
gttaatgaca caggacatga aactgatgag aatagagcga aagttgagat aacgcccac	1080
tcaccaagag ccgaagccac cctggggggg tttggaagcc taggacttga ttgtgaaccg	1140
aggacaggcc ttgacttttc agatttgtat tacttgacta tgaataacaa gcactgggtg	1200
gttcacaagg agtgggtcca cgacattcca ttaccttggc acgctggggc agacaccgga	1260
actccacact ggaacaacaa agaagcactg gtagagtcca aggacgcaca tgccaaaagg	1320
caaactgtcg tggttctagg gagtcaagaa ggagcagttc acacggccct tgctggagct	1380
ctggaggctg agatggatgg tgcaaaggga aggctgtcct ctggccactt gaaatgtcgc	1440
ctgaaaatgg ataaacttag attgaagggc gtgtcatact ctttgtgtac tgcagcgttc	1500
acattcacca agatcccggc tgaaacactg cacgggacag tcacagtgga ggtacagtac	1560
gcagggacag atggaccttg caaggttcca gctcagatgg cgggtggacat gcaaactctg	1620
accccagttg ggaggttgat aaccgctaac cccgtaatca ctgaaagcac tgagaactct	1680
aagatgatgc tggaacttga tccaccattt ggggactctt acattgtcat aggagtcggg	1740
gagaagaaga tcaccaccca ctggcacagg agt	1773

<210> 54
 <211> 2076
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Insert RSP no codon optimization L107D

<400> 54	
agacgaggcg cagatactag tgtcgggaatt gttggcctcc tgctgaccac agctatggca	60
gcggagggtca ctagacgtgg gagtgcatac tatatgtact tggacagaaa cgatgctggg	120
gaggccatat cttttccaac cacattgggg atgaataagt gttatataca gatcatggat	180
cttggacaca tgtgtgatgc caccatgagc tatgaatgcc ctatgctgga tgaggggggtg	240

gaaccagatg acgtcgattg ttggtgcaac acgacgtcaa cttgggttgt gtacggaacc	300
tgccatcaca aaaaaggtga agcacggaga tctagaagag ctgtgacgct cccctcccat	360
tccactagga agctgcaaac gcggtcgcaa acctggttgg aatcaagaga atacacaaag	420
cacttgatta gagtcgaaaa ttggatattt aggaaccctg gcttcgcgtt agcagcagct	480
gccatcgctt ggcttttggg aagctcaacg agccaaaaag tcatatactt ggtcatgata	540
ctgctgattg ccccggcata cagcatcagg tgcataggag tcagcaatag ggactttgtg	600
gaaggatatgt cagggtgggac ctgggttgat gttgtcttgg aacatggagg ttgtgtcacc	660
gtaatggcac aggacaaacc gactgtcgac atagagctgg ttacaacaac agtcagcaac	720
atggcggagg taagatccta ctgctatgag gcatcaatat cagacatggc ttcggacagc	780
cgctgcccaa cacaaggtga agcctacctt gacaagcaat cagacactca atatgtctgc	840
aaaagaacgt tagtgagacag aggctgggga aatggatgtg gagactttgg caaagggagc	900
ctggtgacat gcgctaagtt tgcatgctcc aagaaaatga ccgggaagag catccagcca	960
gagaatctgg agtaccggat aatgctgtca gttcatggct cccagcacag tgggatgatt	1020
gttaatgaca caggacatga aactgatgag aatagagcga aagttgagat aacgcccatt	1080
tcaccaagag ccgaagccac cctgggggggt tttggaagcc taggacttga ttgtgaaccg	1140
aggacaggcc ttgacttttc agatttgtat tacttgacta tgaataacaa gcactggttg	1200
gttcacaagg agtggttcca cgacattcca ttaccttggc acgctggggc agacaccgga	1260
actccacact ggaacaacaa agaagcactg gtagagttca aggacgcaca tgccaaaagg	1320
caaactgtcg tggttctagg gagtcaagaa ggagcagttc acacggccct tgctggagct	1380
ctggaggctg agatggatgg tgcaaaggga aggctgtcct ctggccactt gaaatgtcgc	1440
ctgaaaatgg ataaacttag attgaagggc gtgtcatact ccttgtgtac tgcagcgttc	1500
acattcacca agatcccggc tgaaacactg cacgggacag tcacagtgga ggtacgtac	1560
gcagggacag atggaccttg caaggttcca gctcagatgg cgggtggacat gcaaactctg	1620
accccagttg ggaggttgat aaccgctaac cccgtaatca ctgaaagcac tgagaactct	1680
aagatgatgc tggaacttga tccaccattt ggggactctt acattgtcat aggagtcggg	1740
gagaagaaga tcaccacca ctggcacagg agtggcagca ccattggaaa agcatttgaa	1800
gccactgtga gaggtgccaa gagaatggca gtcttgggag acacagcctg ggactttgga	1860

tcagttggag gcgctctcaa ctcatagggc aaggcatcc atcaaatttt tggagcagct	1920
ttcaaatacat tgtttggagg aatgtcctgg ttctcacaaa ttctcattgg aacgttgctg	1980
atgtggttgg gtctgaacac aaagaatgga tctatttccc ttatgtgctt ggccttaggg	2040
ggagtgttga tcttcttatc cacagccgtc tctgct	2076

<210> 55
 <211> 1773
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Insert sE codon optimization (human)

<400> 55	
cgagaggag cggatacgtc agttggcatt gtgggcttgc tcctcaccac cgctatggcc	60
gcagaagtta caagaagagg gtctgcctac tacatgtatc tggacaggaa cgatgctggc	120
gaagccatct cttttccac aaccctgggg atgaacaagt gctacattca gatcatggat	180
cttggtcaca tgtgcatgc cacaatgtcc tatgagtgtc ccatgctcga tgaggcgctc	240
gagcctgacg acgttgattg ctggtgtaac accaccagca cctgggtggt ctatggcact	300
tgccatcaca agaagggtga agcacggagg tcacgacggg cagtgcatt gccaatcat	360
agcactagga aactgcagac tcgctcccag acctggcttg aatcccaga gtacacgaaa	420
cacctcattc gtgtggagaa ctggatcttc cggaatcccg ggtttgccct ggctgctgcc	480
gctattgcct gggtgctcgg ctctagcaca tcacagaaag tcacttacct ggtgatgac	540
ttgctcattg ctccagccta ctctatcaga tgcacggag tttccaatcg tgactttgtc	600
gaagggatgt ccggaggcac ctgggttgac gtggtgcttg agcatggtgg ctgcgtaacg	660
gtaatggctc aggacaaacc cacggttgac atagaactgg tgaccacgac tgtcagtaat	720
atggccgaag tgcgaagcta ctgctatgag gcctctatct ctgacatggc atcagacagc	780
cggtgtccaa ctcaaggcga agcttatctg gacaagcaat ccgatacaca gtacgtgtgc	840
aagcggactc tcgtggatag aggttggggc aatgggtgtg gtctgtttgg gaaaggcagt	900
ctggtaacat gcgcaaagtt cgcattgtcc aagaaaatga caggaaagag cattcagccg	960
gaaaatctgg agtataggat tatgctcagc gtgcatggga gccagcacag tggcatgatt	1020
gtcaatgata caggccacga aaccgacgag aacagagcga aggttgagat cactcccaat	1080

tcacctcgcg cagaggccac tctgggaggg tttggaagtc tcggtctgga ctgtgaacct	1140
cgcactggcc tggacttcag cgatctgtat tacctgacga tgaacaacaa gcattggctg	1200
gtccataagg agtgggtcca tgatattccg cttccttggc atgccggagc cgataccgga	1260
acaccccact ggaacaacaa agaggctttg gtggagttca aagatgcaca cgctaagcgc	1320
caaaccgtcg tggtcctggg tagccaagaa ggagcggttc aactgcbgct tgccggagcc	1380
ctggaggcgg aaatggatgg ggccaaaggg cgcctttcca gtggacacct gaagtgtcgg	1440
ctgaaaatgg acaagctgag actgaaaggt gtgtcttaca gcctgtgcac cgcagccttc	1500
actttcacca aaatccctgc tgaaaccttg cacggaacag tgacagtaga ggtgcagtat	1560
gcaggcacag atggcccatg taagggtcca gctcagatgg cagtggacat gcagaccctg	1620
actccagtgg gaaggctcat aactgccaat ccggtcatca cagagtctac cgagaactca	1680
aagatgatgc tggagctgga ccctcccttt ggggactctt acatagtcac aggggtaggc	1740
gagaagaaaa tcacccatca ctggcacagg agc	1773

<210> 56

<211> 2076

<212> DNA

<213> Artificial sequence

<220>

<223> Insert RSP codon optimization (human) L107D

<400> 56

cgcagaggcg ctgatactc agttggtata gtgggattgc tgttgacaac cgccatggcc	60
gcagaagtga cgagaagggg ttctgcctac tatatgtacc ttgatcggaa tgacgctgga	120
gaggcaatct cattcccgac caccttgggc atgaacaaat gctacatcca gattatggac	180
ctgggacata tgtgcatgac cactatgagc tatgagtgcc ccatgctgga tgaggagta	240
gagcctgacg atgttgactg ctggtgtaac accactagta catgggtggg gtacggaacg	300
tgccaccaca agaaaggaga agctcgaaga tcccgtcgcg cggttactct tccctcccat	360
tccacaagga aactccaaac ccgtagccag acatggcttg aaagccgaga atacactaaa	420
cacttgatac gggtagagaa ctggattttc cgcaatcccg ggtttgctct tgcagctgcg	480
gcaattgctt ggctcctcgg gtcaagcaca tcccagaagg tgatctacct ggtgatgatc	540
ctgctgattg caccagccta ttcaatccgg tgtatcggtg tctcaaactg tgacttcgtc	600

gaggggatga gtggcgggac ctgggtggat gtcgttctgg aacatggagg ctgtgtaacg	660
gtgatggctc aagacaagcc aaccgttgac atcgaactgg taacgacgac agtcagcaat	720
atggccgaag tccgctctta ctgctatgaa gccagcatca gcgatatggc cagcgatagt	780
cgatgtccga ctcaaggcga agcctatctc gacaaacagt ctgacacca gtacgtgtgc	840
aagaggactc tcgtggatag aggggtggggc aatggttgtg gggatttcgg caaggggtca	900
ctggtaacct gtgcaaagtt cgcctgctct aagaagatga ctgggaagag tatccagccc	960
gagaatctgg agtataggat catgctgagc gttcatggat cccagcatag cgggatgata	1020
gtgaatgata cgggtcacga aacagacgag aaccgcgcaa aggtcgagat tactcccaat	1080
tcccctaggg ccgaagccac actcggaggc tttggcagtc tcggcctgga ttgcgagcct	1140
cgactggac tggatttctc cgacctgtac tacctgacta tgaacaacaa acattggctg	1200
gtgcacaagg aatggtttca cgacattccc ctgccttggc acgctggggc tgacactggt	1260
acacctcatt ggaacaacaa agaggctctg gtggagttca aagatgcaca tgccaagaga	1320
caaaccgtgg tggttctggg atcacaggaa ggcgccgtgc ataccgcgct tgccggagca	1380
ctggaagcag agatggacgg tgctaaaggc cggttgagct ctggccacct taagtgtcgg	1440
ctgaagatgg acaagctgag attgaaagga gtctcctata gtctgtgtac agccgcgttt	1500
acctttacga aaatccccgc tgagacactg cacggaacag tgaccgtgga ggtgcaatat	1560
gcagggactg atggcccatg taagggtgcca gcacagatgg ctgttgacat gcagactctc	1620
acccagtcg gcaggcttat tactgccaat ccggtcataa ccgagagtac agagaatagc	1680
aagatgatgc tggagcttga ccctccattc ggagactcct acattgtcat tggcgtcgg	1740
gagaagaaga ttaccacca ctggcacagg tctggctcca caatcggtaa agccttcgaa	1800
gcgacagtga gaggagccaa acggatggcg gtactcggag acacagcctg ggatttcggg	1860
agcgttggtg gcgctctgaa ctctctcggg aaaggtatcc accagatatt tggggcagcc	1920
tttaaatacac tctttggcgg catgagctgg ttttctcaga tcctgattgg gaccctcctg	1980
atgtggctgg ggctgaacac caagaacggc tctataagcc tgatgtgctt ggccctgggc	2040
ggggtgttga ttttcctgtc caccgctgtg agtgcc	2076

<210> 57

<211> 20896

<212> DNA

<213> Artificial sequence

<220>

<223> MV Zika sE codon optimization (human)

<400> 57

tcatgaacgc ggccgctaatac gactcact atagggccaa ctttgtttgg tctgatgagt	60
ccgtgaggac gaaacccgga gtcccgggtc accaaacaaa gttgggtaag gatagttcaa	120
tcaatgatca tcttctagtgcacttaggat tcaagatcct attatcaggg acaagagcag	180
gattagggat atccgagatg gccacacttt taaggagctt agcattgttc aaaagaaaca	240
aggacaaacc acccattaca tcaggatccg gtggagccat cagaggaatc aaacacatta	300
ttatagtacc aatccctgga gattcctcaa ttaccactcg atccagactt ctggaccggt	360
tggtgagggtt aattggaaac ccggatgtga gcgggcccaa actaacaggg gcactaatag	420
gtatattatc cttatttgtg gagtctccag gtcaattgat tcagaggatc accgatgacc	480
ctgacgttag cataaggctg ttagaggttg tccagagtga ccagtcacaa tctggcctta	540
ccttcgcatac aagagggtacc aacatggagg atgaggcgga ccaatacttt tcacatgatg	600
atccaattag tagtgatcaa tccagggttc gatgggttcgg gaacaaggaa atctcagata	660
ttgaagtgca agaccctgag ggattcaaca tgattctggg taccatccta gcccaaattt	720
gggtccttgct cgcaaaggcg gttacggccc cagacacggc agctgattcg gagctaagaa	780
ggtggataaa gtacacccaa caaagaagggtagttgggtga atttagattg gagagaaaat	840
ggttggatgt ggtgaggaaaggattgccg aggacctctc cttacgccga ttcattggtcg	900
ctctaatacct ggatatcaag agaacacccg gaaacaaacc caggattgct gaaatgatat	960
gtgacattga tacatatatc gtagaggcag gattagccag ttttatcctg actattaagt	1020
ttgggataga aactatgtat cctgctcttg gactgcatga atttgctggt gagttatcca	1080
cacttgagtc cttgatgaac ctttaccagc aaatggggga aactgcaccc tacatggtaa	1140
tcctggagaa ctcaattcag aacaagttca gtgcaggatc ataccctctg ctctggagct	1200
atgccatggg agtaggagtg gaacttgaactccatggg aggtttgaac tttggccgat	1260
cttactttga tccagcatat tttagattag ggcaagagat ggtaaggagg tcagctggaa	1320
aggtcagttc cacattggca tctgaactcg gtatcactgc cgaggatgca aggcttgttt	1380
cagagattgc aatgcatact actgaggaca agatcagtag agcggttgga cccagacaag	1440

cccaagtatc atttctacac ggtgatcaaa gtgagaatga gctaccgaga ttgggggggca	1500
aggaagatag gaggggtcaaa cagagtcgag gagaagccag ggagagctac agagaaaccg	1560
ggcccagcag agcaagtgat gcgagagctg cccatcttcc aaccggcaca cccctagaca	1620
ttgacactgc aacggagtcc agccaagatc cgcaggacag tcgaaggtca gctgacgccc	1680
tgcttaggct gcaagccatg gcaggaatct cggaagaaca aggctcagac acggacaccc	1740
ctatagtgtg caatgacaga aatcttctag actaggtgcg agaggccgag ggccagaaca	1800
acatccgcct accatccatc attgttataa aaaacttagg aaccaggtcc acacagccgc	1860
cagcccatca accatccact cccacgattg gagccaatgg cagaagagca ggcacgccat	1920
gtcaaaaacg gactggaatg catccgggct ctcaaggccg agcccatcgg ctactggcc	1980
atcgaggaag ctatggcagc atggtcagaa atatcagaca acccaggaca ggagcgagcc	2040
acctgcaggg aagagaaggc aggcagttcg ggtctcagca aacctgcct ctcagcaatt	2100
ggatcaactg aaggcgggtgc acctcgcatc cgcggtcagg gacctggaga gagcgatgac	2160
gacgctgaaa ctttgggaat cccccaaga aatctccagg catcaagcac tgggttacag	2220
tgttattacg tttatgatca cagcggtgaa gcggttaagg gaatccaaga tgctgactct	2280
atcatggttc aatcaggcct tgatggtgat agcacctct caggaggaga caatgaatct	2340
gaaaacagcg atgtggatat tggcgaacct gataccgagg gatatgctat cactgaccgg	2400
ggatctgctc ccatctctat ggggttcagg gcttctgatg ttgaaactgc agaaggaggg	2460
gagatccacg agctcctgag actccaatcc agaggcaaca actttccgaa gcttgggaaa	2520
actctcaatg ttcctccgcc cccggacccc ggtagggcca gcacttccgg gacaccatt	2580
aaaaagggca cagacgcgag attagcctca tttggaacgg agatcgctc tttattgaca	2640
ggtggtgcaa cccaatgtgc tcgaaagtca ccctcggaac catcagggcc aggtgcacct	2700
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1           5           10           15

```

```

Thr Ala Met Ala Ala Glu Val Thr Arg Arg Gly Ser Ala Tyr Tyr Met
20           25           30

```

```

Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala Ile Ser Phe Pro Thr Thr
35           40           45

```

```

Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile Met Asp Leu Gly His Met
50           55           60

```

```

Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro Met Leu Asp Glu Gly Val
65           70           75           80

```

```

Glu Pro Asp Asp Val Asp Cys Trp Cys Asn Thr Thr Ser Thr Trp Val
85           90           95

```

```

Val Tyr Gly Thr Cys His His Lys Lys Gly Glu Ala Arg Arg Ser Arg
100          105          110

```

```

Arg Ala Val Thr Leu Pro Ser His Ser Thr Arg Lys Leu Gln Thr Arg
115          120          125

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Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr Thr Lys His Leu Ile Arg
130 135 140

Val Glu Asn Trp Ile Phe Arg Asn Pro Gly Phe Ala Leu Ala Ala Ala
145 150 155 160

Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr Ser Gln Lys Val Ile Tyr
165 170 175

Leu Val Met Ile Leu Leu Ile Ala Pro Ala Tyr Ser Ile Arg Cys Ile
180 185 190

Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser Gly Gly Thr Trp
195 200 205

Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr Val Met Ala Gln
210 215 220

Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr Thr Val Ser Asn
225 230 235 240

Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser Ile Ser Asp Met
245 250 255

Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala Tyr Leu Asp Lys
260 265 270

Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu Val Asp Arg Gly
275 280 285

Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser Leu Val Thr Cys
290 295 300

Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys Ser Ile Gln Pro
305 310 315 320

Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His Gly Ser Gln His
325 330 335

Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr Asp Glu Asn Arg

340

345

350

Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu
 355 360 365

Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu
 370 375 380

Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu
 385 390 395 400

Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly
 405 410 415

Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu
 420 425 430

Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser
 435 440 445

Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu
 450 455 460

Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His Leu Lys Cys Arg
 465 470 475 480

Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys
 485 490 495

Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu Thr Leu His Gly
 500 505 510

Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys
 515 520 525

Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly
 530 535 540

Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser
 545 550 555 560

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

Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp His Arg Ser
580 585 590

<210> 62
<211> 692
<212> PRT
<213> Artificial sequence

<220>
<223> Protein encoded by SEQ ID NOs: 54

<400> 62

Arg Arg Gly Ala Asp Thr Ser Val Gly Ile Val Gly Leu Leu Leu Thr
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Thr Ala Met Ala Ala Glu Val Thr Arg Arg Gly Ser Ala Tyr Tyr Met
20 25 30

Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala Ile Ser Phe Pro Thr Thr
35 40 45

Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile Met Asp Leu Gly His Met
50 55 60

Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro Met Leu Asp Glu Gly Val
65 70 75 80

Glu Pro Asp Asp Val Asp Cys Trp Cys Asn Thr Thr Ser Thr Trp Val
85 90 95

Val Tyr Gly Thr Cys His His Lys Lys Gly Glu Ala Arg Arg Ser Arg
100 105 110

Arg Ala Val Thr Leu Pro Ser His Ser Thr Arg Lys Leu Gln Thr Arg
115 120 125

Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr Thr Lys His Leu Ile Arg
130 135 140

Val Glu Asn Trp Ile Phe Arg Asn Pro Gly Phe Ala Leu Ala Ala Ala
145 150 155 160

Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr Ser Gln Lys Val Ile Tyr
165 170 175

Leu Val Met Ile Leu Leu Ile Ala Pro Ala Tyr Ser Ile Arg Cys Ile
180 185 190

Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser Gly Gly Thr Trp
195 200 205

Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr Val Met Ala Gln
210 215 220

Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr Thr Val Ser Asn
225 230 235 240

Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser Ile Ser Asp Met
245 250 255

Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala Tyr Leu Asp Lys
260 265 270

Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu Val Asp Arg Gly
275 280 285

Trp Gly Asn Gly Cys Gly Asp Phe Gly Lys Gly Ser Leu Val Thr Cys
290 295 300

Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys Ser Ile Gln Pro
305 310 315 320

Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His Gly Ser Gln His
325 330 335

Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr Asp Glu Asn Arg
340 345 350

Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu

355

360

365

Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu
 370 375 380

Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu
 385 390 395 400

Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly
 405 410 415

Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu
 420 425 430

Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser
 435 440 445

Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu
 450 455 460

Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His Leu Lys Cys Arg
 465 470 475 480

Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys
 485 490 495

Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu Thr Leu His Gly
 500 505 510

Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys
 515 520 525

Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly
 530 535 540

Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser
 545 550 555 560

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

Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp His Arg Ser Gly
580 585 590

Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg Gly Ala Lys Arg
595 600 605

Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly
610 615 620

Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile Phe Gly Ala Ala
625 630 635 640

Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser Gln Ile Leu Ile
645 650 655

Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys Asn Gly Ser Ile
660 665 670

Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile Phe Leu Ser Thr
675 680 685

Ala Val Ser Ala
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<210> 63
<211> 1209
<212> DNA
<213> Artificial sequence

<220>
<223> sE antigen no codon optimization

<400> 63
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tatgaggcat caatatcaga catggcttcg gacagccgct gcccaacaca aggtgaagcc 240
taccttgaca agcaatcaga cactcaatat gtctgcaaaa gaacgttagt ggacagaggc 300
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tgctccaaga aaatgaccgg gaagagcatc cagccagaga atctggagta ccgataatg	420
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attccattac cttggcacgc tggggcagac accggaactc cacactggaa caacaaagaa	720
gcactggtag agttcaagga cgcacatgcc aaaaggcaaa ctgtcgtggt tctagggagt	780
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gttccagctc agatggcggg ggacatgcaa actctgaccc cagttgggag gttgataacc	1080
gctaaccctg taatcactga aagcactgag aactctaaga tgatgctgga acttgatcca	1140
ccatttgggg actcttacat tgtcatagga gtcggggaga agaagatcac ccaccactgg	1200
cacaggagt	1209

<210> 64

<211> 1209

<212> DNA

<213> Artificial sequence

<220>

<223> sE antigen codon optimization (human)

<400> 64

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gttgacgtgg tgcttgagca tgggtggctgc gtaacggtaa tggctcagga caaaccacg	120
gttgacatag aactggtgac cacgactgtc agtaatatgg ccgaagtgcg aagctactgc	180
tatgaggcct ctatctctga catggcatca gacagccggt gtccaactca aggcgaagct	240
tatctggaca agcaatccga tacacagtac gtgtgcaagc ggactctcgt ggatagaggt	300
tggggcaatg ggtgtggtct gtttgggaaa ggcagtctgg taacatgcgc aaagttcgca	360
tgttccaaga aaatgacagg aaagagcatt cagccggaat atctggagta taggattatg	420

ctcagcgtgc atgggagcca gcacagtggc atgattgtca atgatacagg ccacgaaacc	480
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gccaatccgg tcatcacaga gtctaccgag aactcaaaga tgatgctgga gctggaccct	1140
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cacaggagc	1209

<210> 65
 <211> 403
 <212> PRT
 <213> Artificial sequence

<220>
 <223> sE antigen L107D

<400> 65

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Gly	Gly	Thr	Trp	Val	Asp	Val	Val	Leu	Glu	His	Gly	Gly	Cys	Val	Thr
		20						25					30		

Val	Met	Ala	Gln	Asp	Lys	Pro	Thr	Val	Asp	Ile	Glu	Leu	Val	Thr	Thr
		35					40					45			

Thr	Val	Ser	Asn	Met	Ala	Glu	Val	Arg	Ser	Tyr	Cys	Tyr	Glu	Ala	Ser
		50				55					60				

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Asp Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His

275

280

285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser

<210> 66

<211> 504

<212> PRT

<213> Artificial sequence

<220>

<223> E antigen L107D

<400> 66

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
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Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
 20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr

35

40

45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
 50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
 65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
 85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Asp Phe Gly Lys Gly Ser
 100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
 115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
 130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
 145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
 165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
 180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
 195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys

465

470

475

480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
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Phe Leu Ser Thr Ala Val Ser Ala
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<210> 67

<211> 10272

<212> DNA

<213> Zika virus isolate GD01 polyprotein gene, complete cds

<400> 67

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<211> 10272

<212> DNA

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Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
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Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Glu Thr Ser Val Gly Ile
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Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
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130

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Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
1250 1255 1260

Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe
1265 1270 1275

Ala Leu Ala Trp Leu Ala Val Arg Ala Met Val Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Thr Leu Ala Ile Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
1310 1315 1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser

1400						1405						1410			
Tyr	Val	Val	Ser	Gly	Lys	Ser	Val	Asp	Met	Tyr	Ile	Glu	Arg	Ala	
1415						1420					1425				
Gly	Asp	Ile	Thr	Trp	Glu	Lys	Asp	Ala	Glu	Val	Thr	Gly	Asn	Ser	
1430						1435					1440				
Pro	Arg	Leu	Asp	Val	Ala	Leu	Asp	Glu	Ser	Gly	Asp	Phe	Ser	Leu	
1445						1450					1455				
Val	Glu	Asp	Asp	Gly	Pro	Pro	Met	Arg	Glu	Ile	Ile	Leu	Lys	Val	
1460						1465					1470				
Val	Leu	Met	Thr	Ile	Cys	Gly	Met	Asn	Pro	Ile	Ala	Ile	Pro	Phe	
1475						1480					1485				
Ala	Ala	Gly	Ala	Trp	Tyr	Val	Tyr	Val	Lys	Thr	Gly	Lys	Arg	Ser	
1490						1495					1500				
Gly	Ala	Leu	Trp	Asp	Val	Pro	Ala	Pro	Lys	Glu	Val	Lys	Lys	Gly	
1505						1510					1515				
Glu	Thr	Thr	Asp	Gly	Val	Tyr	Arg	Val	Met	Thr	Arg	Arg	Leu	Leu	
1520						1525					1530				
Gly	Ser	Thr	Gln	Val	Gly	Val	Gly	Val	Met	Gln	Glu	Gly	Val	Phe	
1535						1540					1545				
His	Thr	Met	Trp	His	Val	Thr	Lys	Gly	Ser	Ala	Leu	Arg	Ser	Gly	
1550						1555					1560				
Glu	Gly	Arg	Leu	Asp	Pro	Tyr	Trp	Gly	Asp	Val	Lys	Gln	Asp	Leu	
1565						1570					1575				
Val	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Ala	Ala	Trp	Asp	Gly	
1580						1585					1590				
His	Ser	Glu	Val	Gln	Leu	Leu	Ala	Val	Pro	Pro	Gly	Glu	Arg	Ala	
1595						1600					1605				

Arg	Asn	Ile	Gln	Thr	Leu	Pro	Gly	Ile	Phe	Lys	Thr	Lys	Asp	Gly
1610						1615					1620			
Asp	Ile	Gly	Ala	Val	Ala	Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly
1625						1630					1635			
Ser	Pro	Ile	Leu	Asp	Lys	Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly
1640						1645					1650			
Asn	Gly	Val	Val	Ile	Lys	Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr
1655						1660					1665			
Gln	Gly	Arg	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro
1670						1675					1680			
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro
1685						1690					1695			
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu
1700						1705					1710			
Ala	Ile	Lys	Thr	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg
1715						1720					1725			
Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro	Val
1730						1735					1740			
Arg	Tyr	Met	Thr	Thr	Ala	Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu
1745						1750					1755			
Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Leu
1760						1765					1770			
Gln	Pro	Ile	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Tyr	Ile	Met	Asp	Glu
1775						1780					1785			
Ala	His	Phe	Thr	Asp	Pro	Ser	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile
1790						1795					1800			
Ser	Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr

1805

1810

1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Asp His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu
2000 2005 2010

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr
2015 2020 2025

Glu Gln Arg Lys Thr Phe Val Glu Leu Met Lys Arg Gly Asp Leu
2030 2035 2040

Pro Val Trp Leu Ala Tyr Gln Val Ala Ser Ala Gly Ile Thr Tyr
2045 2050 2055

Thr Asp Arg Arg Trp Cys Phe Asp Gly Thr Thr Asn Asn Thr Ile
2060 2065 2070

Met Glu Asp Ser Val Pro Ala Glu Val Trp Thr Arg His Gly Glu
2075 2080 2085

Lys Arg Val Leu Lys Pro Arg Trp Met Asp Ala Arg Val Cys Ser
2090 2095 2100

Asp His Ala Ala Leu Lys Ser Phe Lys Glu Phe Ala Ala Gly Lys
2105 2110 2115

Arg Gly Ala Ala Phe Gly Val Met Glu Ala Leu Gly Thr Leu Pro
2120 2125 2130

Gly His Met Thr Glu Arg Phe Gln Glu Ala Ile Asp Asn Leu Ala
2135 2140 2145

Val Leu Met Arg Ala Glu Thr Gly Ser Arg Pro Tyr Lys Ala Ala
2150 2155 2160

Ala Ala Gln Leu Pro Glu Thr Leu Glu Thr Ile Met Leu Leu Gly
2165 2170 2175

Leu Leu Gly Thr Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg
2180 2185 2190

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg

2210	2215	2220
Ile Ala Cys Val Leu Ile 2225	Val Val Phe Leu Leu 2230	Leu Val Val Leu 2235
Ile Pro Glu Pro Glu Lys 2240	Gln Arg Ser Pro Gln 2245	Asp Asn Gln Met 2250
Ala Ile Ile Ile Met Val 2255	Ala Val Gly Leu Leu 2260	Gly Leu Ile Thr 2265
Ala Asn Glu Leu Gly Trp 2270	Leu Glu Arg Thr Lys 2275	Ser Asp Leu Ser 2280
His Leu Met Gly Arg Arg 2285	Glu Glu Gly Ala Thr 2290	Ile Gly Phe Ser 2295
Met Asp Ile Asp Leu Arg 2300	Pro Ala Ser Ala Trp 2305	Ala Ile Tyr Ala 2310
Ala Leu Thr Thr Phe Ile 2315	Thr Pro Ala Val Gln 2320	His Ala Val Thr 2325
Thr Ser Tyr Asn Asn Tyr 2330	Ser Leu Met Ala Met 2335	Ala Thr Gln Ala 2340
Gly Val Leu Phe Gly Met 2345	Gly Lys Gly Met Pro 2350	Phe Tyr Ala Trp 2355
Asp Phe Gly Val Pro Leu 2360	Leu Met Ile Gly Cys 2365	Tyr Ser Gln Leu 2370
Thr Pro Leu Thr Leu Ile 2375	Val Ala Ile Ile Leu 2380	Leu Val Ala His 2385
Tyr Met Tyr Leu Ile Pro 2390	Gly Leu Gln Ala Ala 2395	Ala Ala Arg Ala 2400
Ala Gln Lys Arg Thr Ala 2405	Ala Gly Ile Met Lys 2410	Asn Pro Val Val 2415

Asp	Gly	Ile	Val	Val	Thr	Asp	Ile	Asp	Thr	Met	Thr	Ile	Asp	Pro
	2420					2425					2430			
Gln	Val	Glu	Lys	Lys	Met	Gly	Gln	Val	Leu	Leu	Ile	Ala	Val	Ala
	2435					2440					2445			
Val	Ser	Ser	Ala	Ile	Leu	Ser	Arg	Thr	Ala	Trp	Gly	Trp	Gly	Glu
	2450					2455					2460			
Ala	Gly	Ala	Leu	Ile	Thr	Ala	Ala	Thr	Ser	Thr	Leu	Trp	Glu	Gly
	2465					2470					2475			
Ser	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser	Thr	Ala	Thr	Ser	Leu	Cys
	2480					2485					2490			
Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr
	2495					2500					2505			
Thr	Val	Thr	Arg	Asn	Ala	Gly	Leu	Val	Lys	Arg	Arg	Gly	Gly	Gly
	2510					2515					2520			
Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln
	2525					2530					2535			
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
	2540					2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
	2555					2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
	2570					2575					2580			
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	Tyr	Gly	Lys	Val	Ile
	2585					2590					2595			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
	2600					2605					2610			
Ile	Arg	Lys	Val	Gln	Glu	Val	Lys	Gly	Tyr	Thr	Lys	Gly	Gly	Pro

2615						2620						2625			
Gly	His	Glu	Glu	Pro	Val	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile	
2630						2635					2640				
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu	
2645						2650					2655				
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser	
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Pro	Glu	Val	Glu	Glu	Ala	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val	
2675						2680					2685				
Gly	Asp	Trp	Leu	Glu	Lys	Arg	Pro	Gly	Ala	Phe	Cys	Ile	Lys	Val	
2690						2695					2700				
Leu	Cys	Pro	Tyr	Thr	Ser	Thr	Met	Met	Glu	Thr	Leu	Glu	Arg	Leu	
2705						2710					2715				
Gln	Arg	Arg	Tyr	Gly	Gly	Gly	Leu	Val	Arg	Val	Pro	Leu	Ser	Arg	
2720						2725					2730				
Asn	Ser	Thr	His	Glu	Met	Tyr	Trp	Val	Ser	Gly	Ala	Lys	Ser	Asn	
2735						2740					2745				
Ile	Ile	Lys	Ser	Val	Ser	Thr	Thr	Ser	Gln	Leu	Leu	Leu	Gly	Arg	
2750						2755					2760				
Met	Asp	Gly	Pro	Arg	Arg	Pro	Val	Lys	Tyr	Glu	Glu	Asp	Val	Asn	
2765						2770					2775				
Leu	Gly	Ser	Gly	Thr	Arg	Ala	Val	Ala	Ser	Cys	Ala	Glu	Ala	Pro	
2780						2785					2790				
Asn	Met	Lys	Ile	Ile	Gly	Asn	Arg	Ile	Glu	Arg	Ile	Arg	Ser	Glu	
2795						2800					2805				
His	Ala	Glu	Thr	Trp	Phe	Phe	Asp	Glu	Asn	His	Pro	Tyr	Arg	Thr	
2810						2815					2820				

Trp	Ala	Tyr	His	Gly	Ser	Tyr	Glu	Ala	Pro	Thr	Gln	Gly	Ser	Ala
2825						2830					2835			
Ser	Ser	Leu	Ile	Asn	Gly	Val	Val	Arg	Leu	Leu	Ser	Lys	Pro	Trp
2840						2845					2850			
Asp	Val	Val	Thr	Gly	Val	Thr	Gly	Ile	Ala	Met	Thr	Asp	Thr	Thr
2855						2860					2865			
Pro	Tyr	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr	Arg
2870						2875					2880			
Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Val	Met	Ser	Met	Val
2885						2890					2895			
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	His	Lys	Arg	Pro	Arg
2900						2905					2910			
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala
2915						2920					2925			
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala
2930						2935					2940			
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys
2945						2950					2955			
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	Gln	Ser	Cys	Val	Tyr
2960						2965					2970			
Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys
2975						2980					2985			
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg
2990						2995					3000			
Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp
3005						3010					3015			
Met	Gly	Arg	Glu	Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu

3020

3025

3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
 3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
 3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
 3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
 3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
 3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
 3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
 3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
 3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
 3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
 3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
 3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
 3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
 3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

<211> 3423
 <212> PRT
 <213> Zika virus strain MRS_OPY_Martinique_PaRi_2015 polyprotein
 <400> 89

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
 1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
 20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
 35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
 50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
 65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
 85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Glu Thr Ser Val Gly Ile
 100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
 115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
 130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
 145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
 165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
 180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr	Arg	Thr	Gln	Met	Lys	Gly	Pro	Trp	His	Ser	Glu	Glu	Leu	Glu
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Ile	Arg	Phe	Glu	Glu	Cys	Pro	Gly	Thr	Lys	Val	His	Val	Glu	Glu
1070						1075					1080			
Thr	Cys	Gly	Thr	Arg	Gly	Pro	Ser	Leu	Arg	Ser	Thr	Thr	Ala	Ser
1085						1090					1095			
Gly	Arg	Val	Ile	Glu	Glu	Trp	Cys	Cys	Arg	Glu	Cys	Thr	Met	Pro
1100						1105					1110			
Pro	Leu	Ser	Phe	Trp	Ala	Lys	Asp	Gly	Cys	Trp	Tyr	Gly	Met	Glu
1115						1120					1125			
Ile	Arg	Pro	Arg	Lys	Glu	Pro	Glu	Ser	Asn	Leu	Val	Arg	Ser	Met
1130						1135					1140			
Val	Thr	Ala	Gly	Ser	Thr	Asp	His	Met	Asp	His	Phe	Ser	Leu	Gly
1145						1150					1155			
Val	Leu	Val	Ile	Leu	Leu	Met	Val	Gln	Glu	Gly	Leu	Lys	Lys	Arg
1160						1165					1170			
Met	Thr	Thr	Lys	Ile	Ile	Ile	Ser	Thr	Ser	Met	Ala	Val	Leu	Val
1175						1180					1185			
Ala	Met	Ile	Leu	Gly	Gly	Phe	Ser	Met	Ser	Asp	Leu	Ala	Lys	Leu
1190						1195					1200			
Ala	Ile	Leu	Met	Gly	Ala	Thr	Phe	Ala	Glu	Met	Asn	Thr	Gly	Gly
1205						1210					1215			
Asp	Val	Ala	His	Leu	Ala	Leu	Thr	Ala	Ala	Phe	Lys	Val	Arg	Pro
1220						1225					1230			
Ala	Leu	Leu	Val	Ser	Phe	Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg
1235						1240					1245			
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala
1250						1255					1260			

Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe
1265 1270 1275

Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Val Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Thr Leu Ala Ile Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
1310 1315 1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln	Gly	Arg	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro
	1670					1675					1680			
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro
	1685					1690					1695			
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu
	1700					1705					1710			
Ala	Ile	Lys	Thr	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg
	1715					1720					1725			
Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro	Val
	1730					1735					1740			
Arg	Tyr	Met	Thr	Thr	Ala	Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu
	1745					1750					1755			
Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Leu
	1760					1765					1770			
Gln	Pro	Ile	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Tyr	Ile	Met	Asp	Glu
	1775					1780					1785			
Ala	His	Phe	Thr	Asp	Pro	Ser	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile
	1790					1795					1800			
Ser	Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr
	1805					1810					1815			
Ala	Thr	Pro	Pro	Gly	Thr	Arg	Asp	Ala	Phe	Pro	Asp	Ser	Asn	Ser
	1820					1825					1830			
Pro	Ile	Met	Asp	Thr	Glu	Val	Glu	Val	Pro	Glu	Arg	Ala	Trp	Ser
	1835					1840					1845			
Ser	Gly	Phe	Asp	Trp	Val	Thr	Asp	His	Ser	Gly	Lys	Thr	Val	Trp
	1850					1855					1860			

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Asp His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu
2000 2005 2010

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr
2015 2020 2025

Glu Gln Arg Lys Thr Phe Val Glu Leu Met Lys Arg Gly Asp Leu
2030 2035 2040

Pro Val Trp Leu Ala Tyr Gln Val Ala Ser Ala Gly Ile Thr Tyr
2045 2050 2055

Thr Asp Arg Arg Trp Cys Phe Asp Gly Thr Thr Asn Asn Thr Ile
2060 2065 2070

Met Glu Asp Ser Val Pro Ala Glu Val Trp Thr Arg His Gly Glu
2075 2080 2085

Lys Arg Val Leu Lys Pro Arg Trp Met Asp Ala Arg Val Cys Ser
2090 2095 2100

Asp His Ala Ala Leu Lys Ser Phe Lys Glu Phe Ala Ala Gly Lys
2105 2110 2115

Arg Gly Ala Ala Phe Gly Val Met Glu Ala Leu Gly Thr Leu Pro
2120 2125 2130

Gly His Met Thr Glu Arg Phe Gln Glu Ala Ile Asp Asn Leu Ala
2135 2140 2145

Val Leu Met Arg Ala Glu Thr Gly Ser Arg Pro Tyr Lys Ala Ala
2150 2155 2160

Ala Ala Gln Leu Pro Glu Thr Leu Glu Thr Ile Met Leu Leu Gly
2165 2170 2175

Leu Leu Gly Thr Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg
2180 2185 2190

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
2210 2215 2220

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Ile Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser	Thr	Ala	Thr	Ser	Leu	Cys
	2480					2485					2490			
Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr
	2495					2500					2505			
Thr	Val	Thr	Arg	Asn	Ala	Gly	Leu	Val	Lys	Arg	Arg	Gly	Gly	Gly
	2510					2515					2520			
Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln
	2525					2530					2535			
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
	2540					2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
	2555					2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
	2570					2575					2580			
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	Tyr	Gly	Lys	Val	Ile
	2585					2590					2595			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
	2600					2605					2610			
Ile	Arg	Lys	Val	Gln	Glu	Val	Lys	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
	2615					2620					2625			
Gly	His	Glu	Glu	Pro	Val	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile
	2630					2635					2640			
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu
	2645					2650					2655			
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser
	2660					2665					2670			

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Ser Met Val
2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys His Lys Arg Pro Arg
2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys Gln Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu	Lys	Gly	His	Arg	Ala	Leu	Ala	Leu	Ala	Ile	Ile	Lys	Tyr	Thr
3080						3085					3090			
Tyr	Gln	Asn	Lys	Val	Val	Lys	Val	Leu	Arg	Pro	Ala	Glu	Lys	Gly
3095						3100					3105			
Lys	Thr	Val	Met	Asp	Ile	Ile	Ser	Arg	Gln	Asp	Gln	Arg	Gly	Ser
3110						3115					3120			
Gly	Gln	Val	Val	Thr	Tyr	Ala	Leu	Asn	Thr	Phe	Thr	Asn	Leu	Val
3125						3130					3135			
Val	Gln	Leu	Ile	Arg	Asn	Met	Glu	Ala	Glu	Glu	Val	Leu	Glu	Met
3140						3145					3150			
Gln	Asp	Leu	Trp	Leu	Leu	Arg	Arg	Ser	Glu	Lys	Val	Thr	Asn	Trp
3155						3160					3165			
Leu	Gln	Ser	Asn	Gly	Trp	Asp	Arg	Leu	Lys	Arg	Met	Ala	Val	Ser
3170						3175					3180			
Gly	Asp	Asp	Cys	Val	Val	Lys	Pro	Ile	Asp	Asp	Arg	Phe	Ala	His
3185						3190					3195			
Ala	Leu	Arg	Phe	Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Thr
3200						3205					3210			
Gln	Glu	Trp	Lys	Pro	Ser	Thr	Gly	Trp	Asp	Asn	Trp	Glu	Glu	Val
3215						3220					3225			
Pro	Phe	Cys	Ser	His	His	Phe	Asn	Lys	Leu	His	Leu	Lys	Asp	Gly
3230						3235					3240			
Arg	Ser	Ile	Val	Val	Pro	Cys	Arg	His	Gln	Asp	Glu	Leu	Ile	Gly
3245						3250					3255			
Arg	Ala	Arg	Val	Ser	Pro	Gly	Ala	Gly	Trp	Ser	Ile	Arg	Glu	Thr
3260						3265					3270			
Ala	Cys	Leu	Ala	Lys	Ser	Tyr	Ala	Gln	Met	Trp	Gln	Leu	Leu	Tyr
3275						3280					3285			

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Ala Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

<210> 90
<211> 3423
<212> PRT
<213> Zika virus strain H/PF/2013 polyprotein

<400> 90

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu

35

40

45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
 50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
 65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
 85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
 100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
 115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
 130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
 145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
 165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
 180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
 195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
 210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
 225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
 245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys

465		470		475		480									
Glu	Pro	Arg	Thr	Gly	Leu	Asp	Phe	Ser	Asp	Leu	Tyr	Tyr	Leu	Thr	Met
				485					490					495	
Asn	Asn	Lys	His	Trp	Leu	Val	His	Lys	Glu	Trp	Phe	His	Asp	Ile	Pro
			500					505					510		
Leu	Pro	Trp	His	Ala	Gly	Ala	Asp	Thr	Gly	Thr	Pro	His	Trp	Asn	Asn
		515					520					525			
Lys	Glu	Ala	Leu	Val	Glu	Phe	Lys	Asp	Ala	His	Ala	Lys	Arg	Gln	Thr
	530					535					540				
Val	Val	Val	Leu	Gly	Ser	Gln	Glu	Gly	Ala	Val	His	Thr	Ala	Leu	Ala
545					550					555					560
Gly	Ala	Leu	Glu	Ala	Glu	Met	Asp	Gly	Ala	Lys	Gly	Arg	Leu	Ser	Ser
				565					570					575	
Gly	His	Leu	Lys	Cys	Arg	Leu	Lys	Met	Asp	Lys	Leu	Arg	Leu	Lys	Gly
			580					585					590		
Val	Ser	Tyr	Ser	Leu	Cys	Thr	Ala	Ala	Phe	Thr	Phe	Thr	Lys	Ile	Pro
		595					600					605			
Ala	Glu	Thr	Leu	His	Gly	Thr	Val	Thr	Val	Glu	Val	Gln	Tyr	Ala	Gly
	610					615					620				
Thr	Asp	Gly	Pro	Cys	Lys	Val	Pro	Ala	Gln	Met	Ala	Val	Asp	Met	Gln
625					630					635					640
Thr	Leu	Thr	Pro	Val	Gly	Arg	Leu	Ile	Thr	Ala	Asn	Pro	Val	Ile	Thr
				645					650					655	
Glu	Ser	Thr	Glu	Asn	Ser	Lys	Met	Met	Leu	Glu	Leu	Asp	Pro	Pro	Phe
			660					665					670		
Gly	Asp	Ser	Tyr	Ile	Val	Ile	Gly	Val	Gly	Glu	Lys	Lys	Ile	Thr	His
		675					680					685			

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp

900

905

910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
 915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
 930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
 945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
 965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
 980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
 995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
 1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
 1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
 1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
 1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
 1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
 1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
 1100 1105 1110

Pro	Leu	Ser	Phe	Arg	Ala	Lys	Asp	Gly	Cys	Trp	Tyr	Gly	Met	Glu
1115						1120					1125			
Ile	Arg	Pro	Arg	Lys	Glu	Pro	Glu	Ser	Asn	Leu	Val	Arg	Ser	Met
1130						1135					1140			
Val	Thr	Ala	Gly	Ser	Thr	Asp	His	Met	Asp	His	Phe	Ser	Leu	Gly
1145						1150					1155			
Val	Leu	Val	Ile	Leu	Leu	Met	Val	Gln	Glu	Gly	Leu	Lys	Lys	Arg
1160						1165					1170			
Met	Thr	Thr	Lys	Ile	Ile	Ile	Ser	Thr	Ser	Met	Ala	Val	Leu	Val
1175						1180					1185			
Ala	Met	Ile	Leu	Gly	Gly	Phe	Ser	Met	Ser	Asp	Leu	Ala	Lys	Leu
1190						1195					1200			
Ala	Ile	Leu	Met	Gly	Ala	Thr	Phe	Ala	Glu	Met	Asn	Thr	Gly	Gly
1205						1210					1215			
Asp	Val	Ala	His	Leu	Ala	Leu	Ile	Ala	Ala	Phe	Lys	Val	Arg	Pro
1220						1225					1230			
Ala	Leu	Leu	Val	Ser	Phe	Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg
1235						1240					1245			
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala
1250						1255					1260			
Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Ile	Asn	Gly	Phe
1265						1270					1275			
Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Val	Val	Pro	Arg	Thr
1280						1285					1290			
Asp	Asn	Ile	Thr	Leu	Ala	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala
1295						1300					1305			
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys

1310

1315

1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
 1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
 1340 1345 1350

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
 1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
 1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
 1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
 1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
 1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
 1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
 1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
 1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
 1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
 1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
 1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Arg Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Thr Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg

1715

1720

1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
 1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
 1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
 1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
 1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
 1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
 1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
 1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
 1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
 1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
 1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
 1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
 1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
 1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Asp His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu
2000 2005 2010

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr
2015 2020 2025

Glu Gln Arg Lys Thr Phe Val Glu Leu Met Lys Arg Gly Asp Leu
2030 2035 2040

Pro Val Trp Leu Ala Tyr Gln Val Ala Ser Ala Gly Ile Thr Tyr
2045 2050 2055

Thr Asp Arg Arg Trp Cys Phe Asp Gly Thr Thr Asn Asn Thr Ile
2060 2065 2070

Met Glu Asp Ser Val Pro Ala Glu Val Trp Thr Arg His Gly Glu
2075 2080 2085

Lys Arg Val Leu Lys Pro Arg Trp Met Asp Ala Arg Val Cys Ser
2090 2095 2100

Asp His Ala Ala Leu Lys Ser Phe Lys Glu Phe Ala Ala Gly Lys
2105 2110 2115

Arg Gly Ala Ala Phe Gly Val Met Glu Ala Leu Gly Thr Leu Pro

2120

2125

2130

Gly His Met Thr Glu Arg Phe Gln Glu Ala Ile Asp Asn Leu Ala
 2135 2140 2145

Val Leu Met Arg Ala Glu Thr Gly Ser Arg Pro Tyr Lys Ala Ala
 2150 2155 2160

Ala Ala Gln Leu Pro Glu Thr Leu Glu Thr Ile Met Leu Leu Gly
 2165 2170 2175

Leu Leu Gly Thr Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg
 2180 2185 2190

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
 2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
 2210 2215 2220

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
 2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
 2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
 2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
 2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Ile Gly Phe Ser
 2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
 2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
 2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln

2525							2530								2535
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr	
2540						2545					2550				
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val	
2555						2560					2565				
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg	
2570						2575					2580				
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	Tyr	Gly	Lys	Val	Ile	
2585						2590					2595				
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr	
2600						2605					2610				
Ile	Arg	Lys	Val	Gln	Glu	Val	Lys	Gly	Tyr	Thr	Lys	Gly	Gly	Pro	
2615						2620					2625				
Gly	His	Glu	Glu	Pro	Met	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile	
2630						2635					2640				
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu	
2645						2650					2655				
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser	
2660						2665					2670				
Pro	Glu	Val	Glu	Glu	Ala	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val	
2675						2680					2685				
Gly	Asp	Trp	Leu	Glu	Lys	Arg	Pro	Gly	Ala	Phe	Cys	Ile	Lys	Val	
2690						2695					2700				
Leu	Cys	Pro	Tyr	Thr	Ser	Thr	Met	Met	Glu	Thr	Leu	Glu	Arg	Leu	
2705						2710					2715				
Gln	Arg	Arg	Tyr	Gly	Gly	Gly	Leu	Val	Arg	Val	Pro	Leu	Ser	Arg	
2720						2725					2730				

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Ser Met Val
2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys His Lys Arg Pro Arg
2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala

2930

2935

2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
 2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys Gln Ser Cys Val Tyr
 2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
 2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
 2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
 3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
 3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
 3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
 3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
 3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
 3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
 3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
 3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
 3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp

3335

3340

3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
 3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
 3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
 3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
 3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
 3410 3415 3420

<210> 91

<211> 3423

<212> PRT

<213> Zika virus strain MR 766 polyprotein

<400> 91

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
 1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Asn Pro Leu Gly Gly Leu Lys Arg
 20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
 35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
 50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
 65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
 85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
100 105 110

Ile Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
130 135 140

Ile Ser Phe Ala Thr Thr Leu Gly Val Asn Lys Cys His Val Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Val Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly Tyr
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Lys Leu Phe Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Ile Pro Val Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val
770 775 780

Met Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Ile Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Glu Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Lys Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Glu His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Arg Glu Ala Ala His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Val Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val Tyr Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Met Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Val Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Val Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
1205 1210 1215

Asp Val Ala His Leu Ala Leu Val Ala Ala Phe Lys Val Arg Pro
1220 1225 1230

Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
1235 1240 1245

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
1250 1255 1260

Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe
1265 1270 1275

Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Ala Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Ala Leu Pro Ile Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
1310 1315 1320

Gly Gly Ile Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Val Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Glu Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Ala Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ala Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

Leu Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Lys Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Lys Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys Asn Gln Glu Trp Asp Phe Val
1895 1900 1905

Ile Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Met Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu 1985	Gly	His	Ala	His	Trp	Leu 1990	Glu	Ala	Arg	Met	Leu 1995	Leu	Asp	Asn
Ile 2000	Tyr	Leu	Gln	Asp	Gly	Leu 2005	Ile	Ala	Ser	Leu	Tyr 2010	Arg	Pro	Glu
Ala 2015	Asp	Lys	Val	Ala	Ala	Ile 2020	Glu	Gly	Glu	Phe	Lys 2025	Leu	Arg	Thr
Glu 2030	Gln	Arg	Lys	Thr	Phe	Val 2035	Glu	Leu	Met	Lys	Arg 2040	Gly	Asp	Leu
Pro 2045	Val	Trp	Leu	Ala	Tyr	Gln 2050	Val	Ala	Ser	Ala	Gly 2055	Ile	Thr	Tyr
Thr 2060	Asp	Arg	Arg	Trp	Cys	Phe 2065	Asp	Gly	Thr	Thr	Asn 2070	Asn	Thr	Ile
Met 2075	Glu	Asp	Ser	Val	Pro	Ala 2080	Glu	Val	Trp	Thr	Lys 2085	Tyr	Gly	Glu
Lys 2090	Arg	Val	Leu	Lys	Pro	Arg 2095	Trp	Met	Asp	Ala	Arg 2100	Val	Cys	Ser
Asp 2105	His	Ala	Ala	Leu	Lys	Ser 2110	Phe	Lys	Glu	Phe	Ala 2115	Ala	Gly	Lys
Arg 2120	Gly	Ala	Ala	Leu	Gly	Val 2125	Met	Glu	Ala	Leu	Gly 2130	Thr	Leu	Pro
Gly 2135	His	Met	Thr	Glu	Arg	Phe 2140	Gln	Glu	Ala	Ile	Asp 2145	Asn	Leu	Ala
Val 2150	Leu	Met	Arg	Ala	Glu	Thr 2155	Gly	Ser	Arg	Pro	Tyr 2160	Lys	Ala	Ala
Ala 2165	Ala	Gln	Leu	Pro	Glu	Thr 2170	Leu	Glu	Thr	Ile	Met 2175	Leu	Leu	Gly

Leu Leu Gly Thr Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg
2180 2185 2190

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
2210 2215 2220

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Asn Asp Ile Ala
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Met Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Leu Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Leu Gly Val Pro Leu Leu Met Met Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr	Met	Tyr	Leu	Ile	Pro	Gly	Leu	Gln	Ala	Ala	Ala	Ala	Arg	Ala
	2390					2395						2400		
Ala	Gln	Lys	Arg	Thr	Ala	Ala	Gly	Ile	Met	Lys	Asn	Pro	Val	Val
	2405					2410					2415			
Asp	Gly	Ile	Val	Val	Thr	Asp	Ile	Asp	Thr	Met	Thr	Ile	Asp	Pro
	2420					2425					2430			
Gln	Val	Glu	Lys	Lys	Met	Gly	Gln	Val	Leu	Leu	Ile	Ala	Val	Ala
	2435					2440					2445			
Ile	Ser	Ser	Ala	Val	Leu	Leu	Arg	Thr	Ala	Trp	Gly	Trp	Gly	Glu
	2450					2455					2460			
Ala	Gly	Ala	Leu	Ile	Thr	Ala	Ala	Thr	Ser	Thr	Leu	Trp	Glu	Gly
	2465					2470					2475			
Ser	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser	Thr	Ala	Thr	Ser	Leu	Cys
	2480					2485					2490			
Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr
	2495					2500					2505			
Thr	Val	Thr	Arg	Asn	Ala	Gly	Leu	Val	Lys	Arg	Arg	Gly	Gly	Gly
	2510					2515					2520			
Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln
	2525					2530					2535			
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
	2540					2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
	2555					2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
	2570					2575					2580			

Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	Tyr	Gly	Lys	Val	Val
2585						2590					2595			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
2600						2605					2610			
Ile	Arg	Lys	Val	Gln	Glu	Val	Arg	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
2615						2620					2625			
Gly	His	Glu	Glu	Pro	Met	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile
2630						2635					2640			
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu
2645						2650					2655			
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser
2660						2665					2670			
Pro	Glu	Val	Glu	Glu	Thr	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val
2675						2680					2685			
Gly	Asp	Trp	Leu	Glu	Lys	Arg	Pro	Gly	Ala	Phe	Cys	Ile	Lys	Val
2690						2695					2700			
Leu	Cys	Pro	Tyr	Thr	Ser	Thr	Met	Met	Glu	Thr	Met	Glu	Arg	Leu
2705						2710					2715			
Gln	Arg	Arg	His	Gly	Gly	Gly	Leu	Val	Arg	Val	Pro	Leu	Ser	Arg
2720						2725					2730			
Asn	Ser	Thr	His	Glu	Met	Tyr	Trp	Val	Ser	Gly	Ala	Lys	Ser	Asn
2735						2740					2745			
Ile	Ile	Lys	Ser	Val	Ser	Thr	Thr	Ser	Gln	Leu	Leu	Leu	Gly	Arg
2750						2755					2760			
Met	Asp	Gly	Pro	Arg	Arg	Pro	Val	Lys	Tyr	Glu	Glu	Asp	Val	Asn
2765						2770					2775			
Leu	Gly	Ser	Gly	Thr	Arg	Ala	Val	Ala	Ser	Cys	Ala	Glu	Ala	Pro
2780						2785					2790			

Asn Met Lys Ile Ile Gly Arg Arg Ile Glu Arg Ile Arg Asn Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Leu Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Val Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Asn Ile Val
2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys Arg Lys Arg Pro Arg
2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Arg
2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys His Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Ile Leu Glu Glu Met Asn Arg Ala Pro Gly
3035 3040 3045

Gly Lys Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Lys Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Glu Gly His Arg Thr Leu Ala Leu Ala Val Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Gly Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Lys Pro Glu Lys Val Thr Arg Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Ser Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu Tyr Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ala Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Met
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asp Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

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<211> 3423

<212> PRT

<213> Zika virus strain 8375 polyprotein

<400> 92

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Ile Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg

370

375

380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
 385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
 405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
 420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
 435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
 450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
 465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
 485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
 500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
 515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
 530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
 545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
 565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
 580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr

805

810

815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
 820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
 835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
 850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
 865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Ala Pro Gln
 885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
 900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
 915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
 930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
 945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
 965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
 980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
 995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
 1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Ile Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Ala Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
1205 1210 1215

Asp Val Ala His Leu Ala Leu Ile Ala Ala Phe Lys Val Arg Pro

1220						1225					1230			
Ala	Leu	Leu	Val	Ser	Phe	Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg
1235						1240					1245			
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala
1250						1255					1260			
Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Ile	Asn	Gly	Phe
1265						1270					1275			
Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Val	Val	Pro	Arg	Thr
1280						1285					1290			
Asp	Asn	Ile	Thr	Leu	Ala	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala
1295						1300					1305			
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys
1310						1315					1320			
Gly	Gly	Phe	Met	Leu	Leu	Ser	Leu	Lys	Gly	Lys	Gly	Ser	Val	Lys
1325						1330					1335			
Lys	Asn	Leu	Pro	Phe	Val	Met	Ala	Leu	Gly	Leu	Thr	Ala	Val	Arg
1340						1345					1350			
Leu	Val	Asp	Pro	Ile	Asn	Val	Val	Gly	Leu	Leu	Leu	Leu	Thr	Arg
1355						1360					1365			
Ser	Gly	Lys	Arg	Ser	Trp	Pro	Pro	Ser	Glu	Val	Leu	Thr	Ala	Val
1370						1375					1380			
Gly	Leu	Ile	Cys	Ala	Leu	Ala	Gly	Gly	Phe	Ala	Lys	Ala	Asp	Ile
1385						1390					1395			
Glu	Met	Ala	Gly	Pro	Met	Ala	Ala	Val	Gly	Leu	Leu	Ile	Val	Ser
1400						1405					1410			
Tyr	Val	Val	Ser	Gly	Lys	Ser	Val	Asp	Met	Tyr	Ile	Glu	Arg	Ala
1415						1420					1425			

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
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Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly

1625						1630						1635			
Ser	Pro	Ile	Leu	Asp	Lys	Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly	
1640						1645					1650				
Asn	Gly	Val	Val	Ile	Lys	Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr	
1655						1660					1665				
Gln	Gly	Arg	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro	
1670						1675					1680				
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro	
1685						1690					1695				
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu	
1700						1705					1710				
Ala	Ile	Lys	Thr	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg	
1715						1720					1725				
Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro	Val	
1730						1735					1740				
Arg	Tyr	Met	Thr	Thr	Ala	Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu	
1745						1750					1755				
Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Leu	
1760						1765					1770				
Gln	Pro	Ile	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Tyr	Ile	Met	Asp	Glu	
1775						1780					1785				
Ala	His	Phe	Thr	Asp	Pro	Ser	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile	
1790						1795					1800				
Ser	Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr	
1805						1810					1815				
Ala	Thr	Pro	Pro	Gly	Thr	Arg	Asp	Ala	Phe	Pro	Asp	Ser	Asn	Ser	
1820						1825					1830				

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Asp His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu
2000 2005 2010

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr
2015 2020 2025

Glu Gln Arg Lys Thr Phe Val Glu Leu Met Lys Arg Gly Asp Leu

2030	2035	2040
Pro Val Trp Leu Ala Tyr Gln 2045 2050	Val Ala Ser Ala Gly 2055	Ile Thr Tyr
Thr Asp Arg Arg Trp Cys Phe 2060 2065	Asp Gly Thr Thr Asn 2070	Asn Thr Ile
Leu Glu Asp Ser Val Pro Ala 2075 2080	Glu Val Trp Thr Arg 2085	His Gly Glu
Lys Arg Val Leu Lys Pro Arg 2090 2095	Trp Met Asp Ala Arg 2100	Val Cys Ser
Asp His Ala Ala Leu Lys Ser 2105 2110	Phe Lys Glu Phe Ala 2115	Ala Gly Lys
Arg Gly Ala Ala Phe Gly Val 2120 2125	Met Glu Ala Leu Gly 2130	Thr Leu Pro
Gly His Met Thr Glu Arg Phe 2135 2140	Gln Glu Ala Ile Asp 2145	Asn Leu Ala
Val Leu Met Arg Ala Glu Thr 2150 2155	Gly Ser Arg Pro Tyr 2160	Lys Ala Ala
Ala Ala Gln Leu Pro Glu Thr 2165 2170	Leu Glu Thr Ile Met 2175	Leu Leu Gly
Leu Leu Gly Thr Val Ser Leu 2180 2185	Gly Ile Phe Phe Val 2190	Leu Met Arg
Asn Lys Gly Ile Gly Lys Met 2195 2200	Gly Phe Gly Met Val 2205	Thr Leu Gly
Ala Ser Ala Trp Leu Met Trp 2210 2215	Leu Ser Glu Ile Glu 2220	Pro Ala Arg
Ile Ala Cys Val Leu Ile Val 2225 2230	Val Phe Leu Leu Leu 2235	Val Val Leu

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Ile Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala

2435

2440

2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Ile
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Val Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Arg Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp

2840						2845						2850			
Asp	Val	Val	Thr	Gly	Val	Thr	Gly	Ile	Ala	Met	Thr	Asp	Thr	Thr	
2855						2860					2865				
Pro	Tyr	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr	Arg	
2870						2875					2880				
Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Val	Met	Ser	Met	Val	
2885						2890					2895				
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	His	Lys	Arg	Pro	Arg	
2900						2905					2910				
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala	
2915						2920					2925				
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala	
2930						2935					2940				
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys	
2945						2950					2955				
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	Gln	Ser	Cys	Val	Tyr	
2960						2965					2970				
Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys	
2975						2980					2985				
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg	
2990						2995					3000				
Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp	
3005						3010					3015				
Met	Gly	Arg	Glu	Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu	
3020						3025					3030				
Gln	Arg	Leu	Gly	Tyr	Val	Leu	Glu	Glu	Met	Ser	Cys	Ile	Pro	Gly	
3035						3040					3045				

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly

3245

3250

3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
 3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
 3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
 3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
 3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
 3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
 3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
 3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
 3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
 3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
 3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
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<211> 3423

<212> PRT

<213> Zika virus strain 103344 polyprotein

<400> 93

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Ile Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Ala Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Ile Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Ala Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
1205 1210 1215

Asp Val Ala His Leu Ala Leu Ile Ala Ala Phe Lys Val Arg Pro
1220 1225 1230

Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
1235 1240 1245

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
1250 1255 1260

Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe
1265 1270 1275

Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Val	Val	Pro	Arg	Thr
1280						1285					1290			
Asp	Asn	Ile	Thr	Leu	Ala	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala
1295						1300					1305			
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys
1310						1315					1320			
Gly	Gly	Phe	Met	Leu	Leu	Ser	Leu	Lys	Gly	Lys	Gly	Ser	Val	Lys
1325						1330					1335			
Lys	Asn	Leu	Pro	Phe	Val	Met	Ala	Leu	Gly	Leu	Thr	Ala	Val	Arg
1340						1345					1350			
Leu	Val	Asp	Pro	Ile	Asn	Val	Val	Gly	Leu	Leu	Leu	Leu	Thr	Arg
1355						1360					1365			
Ser	Gly	Lys	Arg	Ser	Trp	Pro	Pro	Ser	Glu	Val	Leu	Thr	Ala	Val
1370						1375					1380			
Gly	Leu	Ile	Cys	Ala	Leu	Ala	Gly	Gly	Phe	Ala	Lys	Ala	Asp	Ile
1385						1390					1395			
Glu	Met	Ala	Gly	Pro	Met	Ala	Ala	Val	Gly	Leu	Leu	Ile	Val	Ser
1400						1405					1410			
Tyr	Val	Val	Ser	Gly	Lys	Ser	Val	Asp	Met	Tyr	Ile	Glu	Arg	Ala
1415						1420					1425			
Gly	Asp	Ile	Thr	Trp	Glu	Lys	Asp	Ala	Glu	Val	Thr	Gly	Asn	Ser
1430						1435					1440			
Pro	Arg	Leu	Asp	Val	Ala	Leu	Asp	Glu	Ser	Gly	Asp	Phe	Ser	Leu
1445						1450					1455			
Val	Glu	Asp	Asp	Gly	Pro	Pro	Met	Arg	Glu	Ile	Ile	Leu	Lys	Val
1460						1465					1470			
Val	Leu	Met	Thr	Ile	Cys	Gly	Met	Asn	Pro	Ile	Ala	Ile	Pro	Phe
1475						1480					1485			

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
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Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Arg Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro
	1685					1690					1695			
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu
	1700					1705					1710			
Ala	Ile	Lys	Thr	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg
	1715					1720					1725			
Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro	Val
	1730					1735					1740			
Arg	Tyr	Met	Thr	Thr	Ala	Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu
	1745					1750					1755			
Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Leu
	1760					1765					1770			
Gln	Pro	Ile	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Tyr	Ile	Met	Asp	Glu
	1775					1780					1785			
Ala	His	Phe	Thr	Asp	Pro	Ser	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile
	1790					1795					1800			
Ser	Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr
	1805					1810					1815			
Ala	Thr	Pro	Pro	Gly	Thr	Arg	Asp	Ala	Phe	Pro	Asp	Ser	Asn	Ser
	1820					1825					1830			
Pro	Ile	Met	Asp	Thr	Glu	Val	Glu	Val	Pro	Glu	Arg	Ala	Trp	Ser
	1835					1840					1845			
Ser	Gly	Phe	Asp	Trp	Val	Thr	Asp	His	Ser	Gly	Lys	Thr	Val	Trp
	1850					1855					1860			
Phe	Val	Pro	Ser	Val	Arg	Asn	Gly	Asn	Glu	Ile	Ala	Ala	Cys	Leu
	1865					1870					1875			
Thr	Lys	Ala	Gly	Lys	Arg	Val	Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe
	1880					1885					1890			

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Asp His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu
2000 2005 2010

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr
2015 2020 2025

Glu Gln Arg Lys Thr Phe Val Glu Leu Met Lys Arg Gly Asp Leu
2030 2035 2040

Pro Val Trp Leu Ala Tyr Gln Val Ala Ser Ala Gly Ile Thr Tyr
2045 2050 2055

Thr Asp Arg Arg Trp Cys Phe Asp Gly Thr Thr Asn Asn Thr Ile
2060 2065 2070

Leu Glu Asp Ser Val Pro Ala Glu Val Trp Thr Arg His Gly Glu
2075 2080 2085

Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser
2090						2095					2100			
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys
2105						2110					2115			
Arg	Gly	Ala	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro
2120						2125					2130			
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala
2135						2140					2145			
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
2150						2155					2160			
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2165						2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
2180						2185					2190			
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
2195						2200					2205			
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
2210						2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
2225						2230					2235			
Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met
2240						2245					2250			
Ala	Ile	Ile	Ile	Met	Val	Ala	Val	Gly	Leu	Leu	Gly	Leu	Ile	Thr
2255						2260					2265			
Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Ser	Asp	Leu	Ser
2270						2275					2280			
His	Leu	Met	Gly	Arg	Arg	Glu	Glu	Gly	Ala	Thr	Ile	Gly	Phe	Ser
2285						2290					2295			

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr
	2495					2500					2505			
Thr	Val	Thr	Arg	Asn	Ala	Gly	Leu	Val	Lys	Arg	Arg	Gly	Gly	Gly
	2510					2515					2520			
Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln
	2525					2530					2535			
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
	2540					2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
	2555					2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
	2570					2575					2580			
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	Tyr	Gly	Lys	Val	Ile
	2585					2590					2595			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
	2600					2605					2610			
Ile	Arg	Lys	Val	Gln	Glu	Val	Lys	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
	2615					2620					2625			
Gly	His	Glu	Glu	Pro	Val	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile
	2630					2635					2640			
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu
	2645					2650					2655			
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser
	2660					2665					2670			
Pro	Glu	Val	Glu	Glu	Ala	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val
	2675					2680					2685			
Gly	Asp	Trp	Leu	Glu	Arg	Arg	Pro	Gly	Ala	Phe	Cys	Ile	Lys	Val
	2690					2695					2700			

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Ser Met Val
2885 2890 2895

Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	His	Lys	Arg	Pro	Arg
2900						2905					2910			
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala
2915						2920					2925			
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala
2930						2935					2940			
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys
2945						2950					2955			
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	Gln	Ser	Cys	Val	Tyr
2960						2965					2970			
Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys
2975						2980					2985			
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg
2990						2995					3000			
Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp
3005						3010					3015			
Met	Gly	Arg	Glu	Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu
3020						3025					3030			
Gln	Arg	Leu	Gly	Tyr	Val	Leu	Glu	Glu	Met	Ser	Cys	Ile	Pro	Gly
3035						3040					3045			
Gly	Arg	Met	Tyr	Ala	Asp	Asp	Thr	Ala	Gly	Trp	Asp	Thr	Arg	Ile
3050						3055					3060			
Ser	Arg	Phe	Asp	Leu	Glu	Asn	Glu	Ala	Leu	Ile	Thr	Asn	Gln	Met
3065						3070					3075			
Glu	Lys	Gly	His	Arg	Ala	Leu	Ala	Leu	Ala	Ile	Ile	Lys	Tyr	Thr
3080						3085					3090			
Tyr	Gln	Asn	Lys	Val	Val	Lys	Val	Leu	Arg	Pro	Ala	Glu	Lys	Gly
3095						3100					3105			

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

<210> 94
<211> 3423
<212> PRT
<213> Zika virus strain ArD158084 polyprotein

<400> 94

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Asn Pro Leu Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
100 105 110

Ile Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
130 135 140

Ile Ser Phe Ala Thr Thr Leu Gly Val Asn Lys Cys His Val Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Val Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala

275

280

285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
 290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
 305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
 325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
 340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
 355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
 370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
 385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
 405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
 420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His
 435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro
 450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
 465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
 485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp

705		710		715		720
Phe Gly Ser Val	Gly Gly Val	Phe Asn Ser	Leu Gly Lys Gly	Ile His		
	725	730		735		
Gln Ile Phe Gly	Ala Ala Phe	Lys Ser Leu	Phe Gly Gly	Met Ser Trp		
	740	745		750		
Phe Ser Gln Ile	Leu Ile Gly	Thr Leu Leu	Val Trp Leu	Gly Leu Asn		
	755	760		765		
Thr Lys Asn Gly	Ser Ile Ser	Leu Thr Cys	Leu Ala Leu	Gly Gly Val		
	770	775		780		
Met Ile Phe Leu	Ser Thr Ala	Val Ser Ala	Asp Val Gly	Cys Ser Val		
785		790		795		800
Asp Phe Ser Lys	Arg Glu Thr	Arg Cys Gly	Thr Gly Val	Phe Ile Tyr		
	805		810		815	
Asn Asp Val Glu	Ala Trp Arg	Asp Arg Tyr	Lys Tyr His	Pro Asp Ser		
	820		825		830	
Pro Arg Arg Leu	Ala Ala Ala	Val Lys Gln	Ala Trp Glu	Glu Gly Ile		
	835		840		845	
Cys Gly Ile Ser	Ser Val Ser	Arg Met Glu	Asn Ile Met	Trp Lys Ser		
	850		855		860	
Val Glu Gly Glu	Leu Asn Ala	Ile Leu Glu	Glu Asn Gly	Val Gln Leu		
865		870		875		880
Thr Val Val Val	Gly Ser Val	Lys Asn Pro	Met Trp Arg	Gly Pro Gln		
	885		890		895	
Arg Leu Pro Val	Pro Val Asn	Gly Leu Pro	His Gly Trp	Lys Ala Trp		
	900		905		910	
Gly Lys Ser Tyr	Phe Val Arg	Ala Ala Lys	Thr Asn Asn	Ser Phe Val		
	915		920		925	

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Arg Glu Ala Ala His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Val Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met

1130						1135						1140			
Val	Thr	Ala	Gly	Ser	Thr	Asp	His	Met	Asp	His	Phe	Ser	Leu	Gly	
1145						1150					1155				
Val	Leu	Val	Ile	Leu	Leu	Met	Val	Gln	Glu	Gly	Leu	Lys	Lys	Arg	
1160						1165					1170				
Met	Thr	Thr	Lys	Ile	Ile	Met	Ser	Thr	Ser	Met	Ala	Val	Leu	Val	
1175						1180					1185				
Val	Met	Ile	Leu	Gly	Gly	Phe	Ser	Met	Ser	Asp	Leu	Ala	Lys	Leu	
1190						1195					1200				
Val	Ile	Leu	Met	Gly	Ala	Thr	Phe	Ala	Glu	Met	Asn	Thr	Gly	Gly	
1205						1210					1215				
Asp	Val	Ala	His	Leu	Ala	Leu	Val	Ala	Ala	Phe	Lys	Val	Arg	Pro	
1220						1225					1230				
Ala	Leu	Leu	Val	Ser	Phe	Ile	Leu	Arg	Ala	Asn	Trp	Thr	Pro	Arg	
1235						1240					1245				
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala	
1250						1255					1260				
Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Val	Asn	Gly	Phe	
1265						1270					1275				
Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Ala	Val	Pro	Arg	Thr	
1280						1285					1290				
Asp	Asn	Ile	Ala	Leu	Ala	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala	
1295						1300					1305				
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys	
1310						1315					1320				
Gly	Gly	Phe	Met	Leu	Leu	Ser	Leu	Lys	Gly	Lys	Gly	Ser	Val	Lys	
1325						1330					1335				

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Val Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Glu Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Ala Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe

1535

1540

1545

His Thr Met Trp His Val Thr Lys Gly Ala Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

Leu Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Lys Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Lys Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Asn Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys Asn Gln Glu Trp Asp Phe Val
1895 1900 1905

Ile Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala

1940	1945	1950
Ser Ala 1955	Ala Gln Arg Arg Gly 1960	Arg Ile Gly Arg Asn 1965
Pro Gly 1970	Asp Glu Tyr Met Tyr 1975	Ala Glu Thr Asp 1980
Glu Gly 1985	His Ala His Trp Leu 1990	Glu Ala Arg Met Leu 1995
Ile Tyr 2000	Leu Gln Asp Gly Leu 2005	Ile Ala Ser Leu Tyr 2010
Ala Asp 2015	Lys Val Ala Ala Ile 2020	Glu Gly Glu Phe Lys 2025
Glu Gln 2030	Arg Lys Thr Phe Val 2035	Glu Leu Met Lys Arg 2040
Pro Val 2045	Trp Leu Ala Tyr Gln 2050	Val Ala Ser Ala Gly 2055
Thr Asp 2060	Arg Arg Trp Cys Phe 2065	Asp Gly Thr Thr Asn 2070
Met Glu 2075	Asp Ser Val Pro Ala 2080	Glu Val Trp Thr Lys 2085
Lys Arg 2090	Val Leu Lys Pro Arg 2095	Trp Met Asp Ala Arg 2100
Asp His 2105	Ala Ala Leu Lys Ser 2110	Phe Lys Glu Phe Ala 2115
Arg Gly 2120	Ala Ala Leu Gly Val 2125	Met Glu Ala Leu Gly 2130
Gly His 2135	Met Thr Glu Arg Phe 2140	Gln Glu Ala Ile Asp 2145

Val Leu Met Arg Ala Glu Thr Gly Ser Arg Pro Tyr Lys Ala Ala
2150 2155 2160

Ala Ala Gln Leu Pro Glu Thr Leu Glu Thr Ile Met Leu Leu Gly
2165 2170 2175

Leu Leu Gly Thr Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg
2180 2185 2190

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
2210 2215 2220

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Asn Asp Ile Ala
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Met Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Leu Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp

2345						2350						2355			
Asp	Phe	Gly	Val	Pro	Leu	Leu	Met	Met	Gly	Cys	Tyr	Ser	Gln	Leu	
2360						2365					2370				
Thr	Pro	Leu	Thr	Leu	Ile	Val	Ala	Ile	Ile	Leu	Leu	Val	Ala	His	
2375						2380					2385				
Tyr	Met	Tyr	Leu	Ile	Pro	Gly	Leu	Gln	Ala	Ala	Ala	Ala	Arg	Ala	
2390						2395					2400				
Ala	Gln	Lys	Arg	Thr	Ala	Ala	Gly	Ile	Met	Lys	Asn	Pro	Val	Val	
2405						2410					2415				
Asp	Gly	Ile	Val	Val	Thr	Asp	Ile	Asp	Thr	Met	Thr	Ile	Asp	Pro	
2420						2425					2430				
Gln	Val	Glu	Lys	Lys	Met	Gly	Gln	Val	Leu	Leu	Ile	Ala	Val	Ala	
2435						2440					2445				
Ile	Ser	Ser	Ala	Val	Leu	Leu	Arg	Thr	Ala	Trp	Gly	Trp	Gly	Glu	
2450						2455					2460				
Ala	Gly	Ala	Leu	Ile	Thr	Ala	Ala	Thr	Ser	Thr	Leu	Trp	Glu	Gly	
2465						2470					2475				
Ser	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser	Thr	Ala	Thr	Ser	Leu	Cys	
2480						2485					2490				
Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr	
2495						2500					2505				
Thr	Val	Thr	Arg	Asn	Ala	Gly	Leu	Val	Lys	Arg	Arg	Gly	Gly	Gly	
2510						2515					2520				
Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln	
2525						2530					2535				
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr	
2540						2545					2550				

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro His Gly Lys Val Val
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Arg Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Met Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Thr Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Met Glu Arg Leu
2705 2710 2715

Gln Arg Arg His Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Ile Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg

2750

2755

2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
 2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Ala Ser Cys Ala Glu Ala Pro
 2780 2785 2790

Asn Met Lys Ile Ile Gly Arg Arg Ile Glu Arg Ile Arg Asn Glu
 2795 2800 2805

His Ala Glu Thr Trp Phe Leu Asp Glu Asn His Pro Tyr Arg Thr
 2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
 2825 2830 2835

Ser Ser Leu Val Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
 2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
 2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
 2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Asn Met Val
 2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys Arg Lys Arg Pro Arg
 2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
 2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
 2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Arg
 2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys His Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Gln Ala Pro Gly
3035 3040 3045

Gly Lys Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Lys Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Glu Gly His Arg Thr Leu Ala Leu Ala Val Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Gly Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Lys Pro Glu Lys Val Thr Arg Trp

3155

3160

3165

Leu Gln Ser Asn Gly Trp Asp Gly Leu Lys Arg Met Ala Val Ser
 3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
 3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
 3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Ser Asn Trp Glu Glu Val
 3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu Tyr Leu Lys Asp Gly
 3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
 3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
 3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
 3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
 3290 3295 3300

Ala Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
 3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Met
 3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
 3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
 3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asp Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
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<400> 95

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Leu Lys Arg Gly Val Ala Arg Val Asn Pro Leu Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
100 105 110

Ile Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
130 135 140

Ile Ser Phe Ala Thr Thr Leu Gly Val Asn Lys Cys His Val Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Thr Arg Arg Ser Arg Arg Ser Val Ser Leu Arg Tyr His Tyr Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Lys Lys His Leu Ile Met Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Ile Val Ser Val Ala Ile Thr Trp Leu Met Gly Ser Leu Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Val Leu Ile Val Pro Ala
275 280 285

Tyr Ser Ile Ser Cys Ile Gly Val Ser Asn Arg Asp Leu Val Glu Gly

290

295

300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Glu Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Met Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Leu Ser Asp Met Ala Ser Ala Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Pro Ser Leu Asp Lys Gln Ser Asp Thr Gln Ser Val Cys Lys Arg
370 375 380

Thr Leu Gly Asp Arg Gly Trp Gly Asn Gly Cys Gly Ile Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ser Lys Phe Thr Cys Cys Lys Lys Met Pro
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Pro
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Ser Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Ile His

725

730

735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
 740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn
 755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val
 770 775 780

Met Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
 785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Ile Tyr
 805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
 820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Glu Gly Ile
 835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Lys Ser
 850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
 865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
 885 890 895

Arg Leu Pro Val Pro Val Asn Xaa Leu Pro His Gly Trp Lys Ala Trp
 900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
 915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
 930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Arg Glu Ala Ala His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Val Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly

1145		1150		1155
Val Leu 1160	Val Ile Leu Leu	Met 1165	Val Gln Glu Gly	Leu Lys Lys Arg 1170
Met Thr 1175	Thr Lys Ile Ile	Met 1180	Ser Thr Ser Met	Ala Val Leu Val 1185
Val Met 1190	Ile Leu Gly Gly	Phe 1195	Ser Met Ser Asp	Leu Ala Lys Leu 1200
Val Ile 1205	Leu Met Gly Ala	Thr 1210	Phe Ala Glu Met	Asn Thr Gly Gly 1215
Asp Val 1220	Ala His Leu Ala	Leu 1225	Val Ala Ala Phe	Lys Val Arg Pro 1230
Ala Leu 1235	Leu Val Ser Phe	Ile 1240	Leu Arg Ala Asn	Trp Thr Pro Arg 1245
Glu Ser 1250	Met Leu Leu Ala	Leu 1255	Ala Ser Cys Leu	Leu Gln Thr Ala 1260
Ile Ser 1265	Ala Leu Glu Gly	Asp 1270	Leu Met Val Leu	Val Asn Gly Phe 1275
Ala Leu 1280	Ala Trp Leu Ala	Ile 1285	Arg Ala Met Ala	Val Pro Arg Thr 1290
Asp Asn 1295	Ile Ala Leu Ala	Ile 1300	Leu Ala Ala Leu	Thr Pro Leu Ala 1305
Arg Gly 1310	Thr Leu Leu Val	Ala 1315	Trp Arg Ala Gly	Leu Ala Thr Cys 1320
Gly Gly 1325	Phe Met Leu Leu	Ser 1330	Leu Lys Gly Lys	Gly Ser Val Lys 1335
Lys Asn 1340	Leu Pro Phe Val	Met 1345	Ala Leu Gly Leu	Thr Ala Val Arg 1350

Val Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Glu Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Ala Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ala Ala Leu Arg Ser Gly

1550						1555						1560			
Glu	Gly	Arg	Leu	Asp	Pro	Tyr	Trp	Gly	Asp	Val	Lys	Gln	Asp	Leu	
1565						1570					1575				
Val	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Ala	Ala	Trp	Asp	Gly	
1580						1585					1590				
Leu	Ser	Glu	Val	Gln	Leu	Leu	Ala	Val	Pro	Pro	Gly	Glu	Arg	Ala	
1595						1600					1605				
Arg	Asn	Ile	Gln	Thr	Leu	Pro	Gly	Ile	Phe	Lys	Thr	Lys	Asp	Gly	
1610						1615					1620				
Asp	Ile	Gly	Ala	Val	Ala	Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly	
1625						1630					1635				
Ser	Pro	Ile	Leu	Asp	Lys	Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly	
1640						1645					1650				
Asn	Gly	Val	Val	Ile	Lys	Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr	
1655						1660					1665				
Gln	Gly	Lys	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro	
1670						1675					1680				
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro	
1685						1690					1695				
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu	
1700						1705					1710				
Ala	Ile	Lys	Lys	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Pro	
1715						1720					1725				
Val	Glu	Arg	Ser	Tyr	Ser	Arg	Trp	Ser	Leu	Trp	Pro	Ser	Val	Ala	
1730						1735					1740				
Arg	Thr	Gln	Thr	Thr	Ala	Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu	
1745						1750					1755				

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Asn Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Ser Gly Glu Glu Ser Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys Asn Gln Glu Trp Asp Phe Val
1895 1900 1905

Ile Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys

1955						1960						1965					
Pro	Gly	Asp	Glu	Tyr	Met	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp			
1970						1975					1980						
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn			
1985						1990					1995						
Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu			
2000						2005					2010						
Ala	Asp	Lys	Val	Ala	Ala	Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr			
2015						2020					2025						
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu			
2030						2035					2040						
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr			
2045						2050					2055						
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile			
2060						2065					2070						
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Lys	Tyr	Gly	Glu			
2075						2080					2085						
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser			
2090						2095					2100						
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys			
2105						2110					2115						
Arg	Gly	Ala	Ala	Leu	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro			
2120						2125					2130						
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala			
2135						2140					2145						
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala			
2150						2155					2160						

Ala Ala Gln Leu Pro Glu Thr Leu Glu Thr Ile Met Leu Leu Gly
2165 2170 2175

Leu Leu Gly Thr Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg
2180 2185 2190

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
2210 2215 2220

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Asn Asp Ile Ala
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Met Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Leu Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Met His Gly
2345 2350 2355

Asp Leu Gly Val Pro Leu Leu Met Met Gly Cys Tyr Ser Gln Leu

2360

2365

2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
 2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
 2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
 2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
 2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
 2435 2440 2445

Ile Ser Ser Ala Val Leu Leu Arg Thr Ala Trp Gly Trp Gly Glu
 2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
 2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
 2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
 2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
 2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
 2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
 2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
 2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro His Gly Lys Val Val
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Arg Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Met Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Thr Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Met Glu Arg Leu
2705 2710 2715

Gln Arg Arg His Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Ile Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn

2765

2770

2775

Leu Gly Ser Gly Thr Arg Ala Val Ala Ser Cys Ala Glu Ala Pro
 2780 2785 2790

Asn Met Lys Ile Ile Gly Arg Arg Ile Glu Arg Ile Arg Asn Glu
 2795 2800 2805

His Ala Glu Thr Trp Phe Leu Asp Glu Asn His Pro Tyr Arg Thr
 2810 2815 2820

Trp Ala Tyr His Gly Xaa Tyr Glu Ala Pro Thr Gln Gly Ser Ala
 2825 2830 2835

Ser Ser Leu Val Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
 2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
 2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
 2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Asn Met Val
 2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys Arg Lys Arg Pro Arg
 2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
 2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
 2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Arg
 2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys His Ser Cys Val Tyr
 2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ser Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Gln Ala Pro Gly
3035 3040 3045

Gly Lys Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Lys Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Glu Gly His Arg Thr Leu Ala Leu Ala Val Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Gly Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Lys Pro Glu Lys Val Thr Arg Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser

3170

3175

3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Ser Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu Tyr Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ala Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Met
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asp Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
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<222> (442)..(446)
<223> Xaa can be any naturally occurring amino acid

<400> 96

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Leu Lys Arg Gly Val Ala Arg Val Asn Pro Leu Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
100 105 110

Ile Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
130 135 140

Ile Ser Phe Ala Thr Thr Leu Gly Val Asn Lys Cys His Val Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Xaa Xaa Xaa Xaa Xaa Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Arg Leu Val Arg Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His
675 680 685

His Trp Leu Lys Lys Gly Ser Ser Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Val His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val
770 775 780

Met Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Glu Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Lys Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Ile Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Ala His Ser Asp Leu
980 985 990

Cys Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Arg Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Val Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val Tyr Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Met Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Val Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Val Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
1205 1210 1215

Asp Val Ala His Leu Ala Leu Val Ala Ala Phe Lys Val Arg Pro
1220 1225 1230

Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
1235 1240 1245

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
1250 1255 1260

Ile Ser Ala Leu Glu Gly Glu Leu Met Val Leu Val Asn Gly Phe
1265 1270 1275

Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Ala Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Ala Leu Ala Thr Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
1310 1315 1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Ala Ala Val Arg
1340 1345 1350

Ile Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly	Leu	Ile	Cys	Ala	Leu	Ala	Gly	Gly	Phe	Ala	Lys	Ala	Asp	Ile
1385						1390					1395			
Glu	Met	Ala	Gly	Pro	Met	Ala	Ala	Val	Gly	Leu	Leu	Ile	Val	Ser
1400						1405					1410			
Tyr	Val	Val	Ser	Gly	Lys	Ser	Val	Asp	Met	Tyr	Ile	Glu	Arg	Ala
1415						1420					1425			
Gly	Asp	Ile	Thr	Trp	Glu	Lys	Asp	Ala	Glu	Val	Thr	Gly	Asn	Ser
1430						1435					1440			
Pro	Arg	Leu	Asp	Val	Ala	Leu	Asp	Glu	Ser	Gly	Asp	Phe	Ser	Leu
1445						1450					1455			
Val	Glu	Glu	Asp	Gly	Pro	Pro	Met	Arg	Glu	Ile	Ile	Leu	Lys	Val
1460						1465					1470			
Val	Leu	Met	Ala	Ile	Cys	Gly	Met	Asn	Pro	Ile	Ala	Ile	Pro	Phe
1475						1480					1485			
Ala	Ala	Gly	Ala	Trp	Tyr	Val	Tyr	Val	Lys	Thr	Gly	Lys	Arg	Ser
1490						1495					1500			
Gly	Ala	Leu	Trp	Asp	Val	Pro	Ala	Pro	Lys	Glu	Val	Lys	Lys	Gly
1505						1510					1515			
Glu	Thr	Thr	Asp	Gly	Val	Tyr	Arg	Val	Met	Thr	Arg	Arg	Leu	Leu
1520						1525					1530			
Gly	Ser	Thr	Gln	Val	Gly	Val	Gly	Val	Met	Gln	Glu	Gly	Val	Phe
1535						1540					1545			
His	Thr	Met	Trp	His	Val	Thr	Lys	Gly	Ala	Ala	Leu	Arg	Ser	Gly
1550						1555					1560			
Glu	Gly	Arg	Leu	Asp	Pro	Tyr	Trp	Gly	Asp	Val	Lys	Gln	Asp	Leu
1565						1570					1575			
Val	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Ala	Thr	Trp	Asp	Gly
1580						1585					1590			

Leu Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Lys Arg Glu Glu Glu Ala Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Arg Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Lys Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Asn Ile Met Asp Glu
1775 1780 1785

Ala	His	Phe	Thr	Asp	Pro	Ser	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile
1790						1795					1800			
Ser	Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr
1805						1810					1815			
Ala	Thr	Pro	Pro	Gly	Thr	Arg	Asp	Ala	Phe	Pro	Asp	Ser	Asn	Ser
1820						1825					1830			
Pro	Ile	Met	Asp	Thr	Glu	Val	Glu	Val	Pro	Glu	Arg	Ala	Trp	Ser
1835						1840					1845			
Ser	Gly	Phe	Asp	Trp	Val	Thr	Asp	His	Ser	Gly	Lys	Thr	Ile	Trp
1850						1855					1860			
Phe	Val	Pro	Ser	Val	Arg	Asn	Gly	Asn	Glu	Ile	Ala	Ala	Cys	Leu
1865						1870					1875			
Thr	Lys	Ala	Gly	Lys	Arg	Val	Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe
1880						1885					1890			
Glu	Thr	Glu	Phe	Gln	Lys	Thr	Lys	Asn	Gln	Glu	Trp	Asp	Phe	Val
1895						1900					1905			
Ile	Thr	Thr	Asp	Ile	Ser	Glu	Met	Gly	Ala	Asn	Phe	Lys	Ala	Asp
1910						1915					1920			
Arg	Val	Ile	Asp	Ser	Arg	Arg	Cys	Leu	Lys	Pro	Val	Ile	Leu	Asp
1925						1930					1935			
Gly	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro	Met	Pro	Val	Thr	His	Ala
1940						1945					1950			
Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly	Arg	Asn	Pro	Asn	Lys
1955						1960					1965			
Pro	Gly	Asp	Glu	Tyr	Met	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp
1970						1975					1980			
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn
1985						1990					1995			

Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu
2000						2005					2010			
Ala	Asp	Lys	Val	Ala	Ala	Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr
2015						2020					2025			
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu
2030						2035					2040			
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr
2045						2050					2055			
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile
2060						2065					2070			
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Lys	Tyr	Gly	Glu
2075						2080					2085			
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser
2090						2095					2100			
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys
2105						2110					2115			
Arg	Gly	Ala	Ala	Leu	Gly	Val	Met	Asp	Ala	Leu	Gly	Thr	Leu	Pro
2120						2125					2130			
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala
2135						2140					2145			
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
2150						2155					2160			
Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly
2165						2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
2180						2185					2190			

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
2210 2215 2220

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Ile Ala
2270 2275 2280

Tyr Leu Met Gly Arg Lys Glu Glu Gly Thr Thr Ile Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Leu Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Val Leu Leu Arg Thr Ala Gly Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro His Gly Lys Val Val
2585 2590 2595

Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
2600						2605					2610			
Ile	Arg	Lys	Val	Gln	Glu	Val	Arg	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
2615						2620					2625			
Gly	His	Glu	Glu	Pro	Met	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile
2630						2635					2640			
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu
2645						2650					2655			
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser
2660						2665					2670			
Pro	Glu	Val	Glu	Glu	Thr	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val
2675						2680					2685			
Glu	Asp	Trp	Leu	Glu	Lys	Arg	Pro	Gly	Ala	Phe	Cys	Ile	Lys	Val
2690						2695					2700			
Leu	Cys	Pro	Tyr	Thr	Ser	Thr	Met	Met	Glu	Thr	Met	Glu	Arg	Leu
2705						2710					2715			
Gln	Arg	Arg	His	Gly	Gly	Gly	Leu	Val	Arg	Val	Pro	Leu	Ser	Arg
2720						2725					2730			
Asn	Ser	Thr	His	Glu	Met	Tyr	Trp	Val	Ser	Gly	Ala	Lys	Ser	Asn
2735						2740					2745			
Ile	Ile	Lys	Ser	Val	Ser	Thr	Thr	Ser	Gln	Leu	Leu	Leu	Gly	Arg
2750						2755					2760			
Met	Asp	Gly	Pro	Arg	Arg	Pro	Val	Lys	Tyr	Glu	Glu	Asp	Val	Asn
2765						2770					2775			
Leu	Gly	Ser	Gly	Thr	Arg	Ala	Val	Ala	Ser	Cys	Ala	Glu	Ala	Pro
2780						2785					2790			
Asn	Met	Lys	Ile	Ile	Gly	Arg	Arg	Ile	Glu	Arg	Ile	Arg	Asn	Glu
2795						2800					2805			

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Val Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Asn Ile Val
2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys Arg Lys Arg Pro Arg
2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys His Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp
3005						3010					3015			
Met	Gly	Arg	Glu	Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu
3020						3025					3030			
Gln	Arg	Leu	Gly	Tyr	Ile	Leu	Glu	Glu	Met	Asn	Arg	Ala	Pro	Gly
3035						3040					3045			
Gly	Lys	Met	Tyr	Ala	Asp	Asp	Thr	Ala	Gly	Trp	Asp	Thr	Arg	Ile
3050						3055					3060			
Ser	Lys	Phe	Asp	Leu	Glu	Asn	Glu	Ala	Leu	Ile	Thr	Asn	Gln	Met
3065						3070					3075			
Glu	Glu	Gly	His	Arg	Ala	Leu	Ala	Leu	Ala	Val	Ile	Lys	Tyr	Thr
3080						3085					3090			
Tyr	Gln	Asn	Lys	Val	Val	Lys	Val	Leu	Arg	Pro	Ala	Glu	Gly	Gly
3095						3100					3105			
Lys	Thr	Val	Met	Asp	Ile	Ile	Ser	Arg	Gln	Asp	Gln	Arg	Gly	Ser
3110						3115					3120			
Gly	Gln	Val	Val	Thr	Tyr	Ala	Leu	Asn	Thr	Phe	Thr	Asn	Leu	Val
3125						3130					3135			
Val	Gln	Leu	Ile	Arg	Asn	Met	Glu	Ala	Glu	Glu	Val	Leu	Glu	Met
3140						3145					3150			
His	Asp	Leu	Trp	Leu	Leu	Arg	Lys	Pro	Glu	Lys	Val	Thr	Arg	Trp
3155						3160					3165			
Leu	Gln	Ser	Asn	Gly	Trp	Asp	Arg	Leu	Lys	Arg	Met	Ala	Val	Ser
3170						3175					3180			
Gly	Asp	Asp	Cys	Val	Val	Lys	Pro	Ile	Asp	Asp	Arg	Phe	Ala	His
3185						3190					3195			
Ala	Leu	Arg	Phe	Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Thr
3200						3205					3210			

Gln Glu Trp Lys Pro Ser Thr Gly Trp Ser Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ala Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Met
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Pro Lys Trp Thr Glu Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Ser Leu Trp Cys Gly Tyr Ile Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asp Thr Val Asn Met Val Leu
3380 3385 3390

Arg Leu Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
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 <213> Zika virus strain ArD7117 polyprotein

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 <222> (1437)..(1437)
 <223> Xaa can be any naturally occurring amino acid

<220>
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 <222> (1742)..(1742)
 <223> Xaa can be any naturally occurring amino acid

<400> 97

Met Lys Asn Pro Lys Lys Arg Ser Gly Gly Phe Arg Ile Val Asn Met
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Leu Lys Arg Gly Val Ala Arg Val Asn Pro Leu Gly Gly Leu Lys Arg
 20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
 35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
 50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
 65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
 85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
 100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
 115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
130 135 140

Ile Ser Phe Ala Thr Thr Leu Gly Val Asn Lys Cys His Val Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys Gln His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Val Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Val Cys Thr Ala Ala Lys Val Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val
770 775 780

Met Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Glu Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Lys Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Ile Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Ala His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Arg Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Val Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Met Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Val Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Val Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
1205 1210 1215

Asp Val Ala His Leu Ala Leu Val Ala Ala Phe Lys Val Arg Pro
1220 1225 1230

Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
1235 1240 1245

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
1250 1255 1260

Ile Ser Ala Leu Glu Gly Glu Leu Met Val Leu Val Asn Gly Phe
1265 1270 1275

Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Ala Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Ala Leu Ala Ile Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
1310 1315 1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Ile Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu	Met	Ala	Gly	Pro	Met	Ala	Ala	Val	Gly	Leu	Leu	Ile	Val	Ser
1400						1405					1410			
Tyr	Val	Val	Ser	Gly	Lys	Ser	Val	Asp	Met	Tyr	Ile	Glu	Arg	Ala
1415						1420					1425			
Gly	Asp	Ile	Thr	Trp	Glu	Lys	Asp	Xaa	Glu	Val	Thr	Gly	Asn	Ser
1430						1435					1440			
Pro	Arg	Leu	Asp	Val	Ala	Leu	Asp	Glu	Ser	Gly	Asp	Phe	Ser	Leu
1445						1450					1455			
Val	Glu	Glu	Asp	Gly	Pro	Pro	Met	Arg	Glu	Ile	Ile	Leu	Lys	Val
1460						1465					1470			
Val	Leu	Met	Ala	Ile	Cys	Gly	Met	Asn	Pro	Ile	Ala	Ile	Pro	Phe
1475						1480					1485			
Ala	Ala	Gly	Ala	Trp	Tyr	Val	Tyr	Val	Lys	Thr	Gly	Lys	Arg	Ser
1490						1495					1500			
Gly	Ala	Leu	Trp	Asp	Val	Pro	Ala	Pro	Lys	Glu	Val	Lys	Lys	Gly
1505						1510					1515			
Glu	Thr	Thr	Asp	Gly	Val	Tyr	Arg	Val	Met	Thr	Arg	Arg	Leu	Leu
1520						1525					1530			
Gly	Ser	Thr	Gln	Val	Gly	Val	Gly	Val	Met	Gln	Glu	Gly	Val	Phe
1535						1540					1545			
His	Thr	Met	Trp	His	Val	Thr	Lys	Gly	Ala	Ala	Leu	Arg	Ser	Gly
1550						1555					1560			
Glu	Gly	Arg	Leu	Asp	Pro	Tyr	Trp	Gly	Asp	Val	Lys	Gln	Asp	Leu
1565						1570					1575			
Val	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Ala	Ala	Trp	Asp	Gly
1580						1585					1590			
Leu	Ser	Glu	Val	Gln	Leu	Leu	Ala	Val	Pro	Pro	Gly	Glu	Arg	Ala
1595						1600					1605			

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Lys Arg Glu Glu Glu Ala Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Arg Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Lys Arg Leu Arg Thr Leu Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Xaa Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Asn Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser	Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr
1805						1810					1815			
Ala	Thr	Pro	Pro	Gly	Thr	Arg	Asp	Ala	Phe	Pro	Asp	Ser	Asn	Ser
1820						1825					1830			
Pro	Ile	Met	Asp	Thr	Glu	Val	Glu	Val	Pro	Glu	Arg	Ala	Trp	Ser
1835						1840					1845			
Ser	Gly	Phe	Asp	Trp	Val	Thr	Asp	His	Ser	Gly	Lys	Thr	Ile	Trp
1850						1855					1860			
Phe	Val	Pro	Ser	Val	Arg	Ser	Gly	Glu	Glu	Ser	Ala	Ala	Cys	Leu
1865						1870					1875			
Thr	Lys	Ala	Gly	Lys	Arg	Val	Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe
1880						1885					1890			
Glu	Thr	Glu	Phe	Gln	Lys	Thr	Lys	Asn	Gln	Glu	Trp	Asp	Phe	Val
1895						1900					1905			
Ile	Thr	Thr	Asp	Ile	Ser	Glu	Met	Gly	Ala	Asn	Phe	Lys	Ala	Asp
1910						1915					1920			
Arg	Val	Ile	Asp	Ser	Arg	Arg	Cys	Leu	Lys	Pro	Val	Ile	Leu	Asp
1925						1930					1935			
Gly	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro	Met	Pro	Val	Thr	His	Ala
1940						1945					1950			
Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly	Arg	Asn	Pro	Asn	Lys
1955						1960					1965			
Pro	Gly	Asp	Glu	Tyr	Met	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp
1970						1975					1980			
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn
1985						1990					1995			
Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu
2000						2005					2010			

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr
2015 2020 2025

Glu Gln Arg Lys Thr Phe Val Glu Leu Met Lys Arg Gly Asp Leu
2030 2035 2040

Pro Val Trp Leu Ala Tyr Gln Val Ala Ser Ala Gly Ile Thr Tyr
2045 2050 2055

Thr Asp Arg Arg Trp Cys Phe Asp Gly Thr Thr Asn Asn Thr Ile
2060 2065 2070

Met Glu Asp Ser Val Pro Ala Glu Val Trp Thr Lys Tyr Gly Glu
2075 2080 2085

Lys Arg Val Leu Lys Pro Arg Trp Met Asp Ala Arg Val Cys Ser
2090 2095 2100

Asp His Ala Ala Leu Lys Ser Phe Lys Glu Phe Ala Ala Gly Lys
2105 2110 2115

Arg Gly Ala Ala Leu Gly Val Met Asp Ala Leu Gly Thr Leu Pro
2120 2125 2130

Gly His Met Thr Glu Arg Phe Gln Glu Ala Ile Asp Asn Leu Ala
2135 2140 2145

Val Leu Met Arg Ala Glu Thr Gly Ser Arg Pro Tyr Lys Ala Ala
2150 2155 2160

Ala Ala Gln Leu Pro Glu Thr Leu Glu Thr Ile Met Leu Leu Gly
2165 2170 2175

Leu Leu Gly Thr Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg
2180 2185 2190

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
2210						2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
2225						2230					2235			
Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met
2240						2245					2250			
Ala	Ile	Ile	Ile	Met	Val	Ala	Val	Gly	Leu	Leu	Gly	Leu	Ile	Thr
2255						2260					2265			
Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Ser	Asp	Ile	Ala
2270						2275					2280			
His	Leu	Met	Gly	Arg	Lys	Glu	Glu	Gly	Thr	Thr	Ile	Gly	Phe	Ser
2285						2290					2295			
Met	Asp	Ile	Asp	Leu	Arg	Pro	Ala	Ser	Ala	Trp	Ala	Ile	Tyr	Ala
2300						2305					2310			
Ala	Leu	Thr	Thr	Leu	Ile	Thr	Pro	Ala	Val	Gln	His	Ala	Val	Thr
2315						2320					2325			
Thr	Ser	Tyr	Asn	Asn	Tyr	Ser	Leu	Met	Ala	Met	Ala	Thr	Gln	Ala
2330						2335					2340			
Gly	Val	Leu	Phe	Gly	Met	Gly	Lys	Gly	Met	Pro	Phe	Tyr	Ala	Trp
2345						2350					2355			
Asp	Phe	Gly	Val	Pro	Leu	Leu	Met	Met	Gly	Cys	Tyr	Ser	Gln	Leu
2360						2365					2370			
Thr	Pro	Leu	Thr	Leu	Ile	Val	Ala	Ile	Ile	Leu	Leu	Val	Ala	His
2375						2380					2385			
Tyr	Met	Tyr	Leu	Ile	Pro	Gly	Leu	Gln	Ala	Ala	Ala	Ala	Arg	Ala
2390						2395					2400			
Ala	Gln	Lys	Arg	Thr	Ala	Ala	Gly	Ile	Met	Lys	Asn	Pro	Val	Val
2405						2410					2415			

Asp	Gly	Ile	Val	Val	Thr	Asp	Ile	Asp	Thr	Met	Thr	Ile	Asp	Pro
	2420					2425					2430			
Gln	Val	Glu	Lys	Lys	Met	Gly	Gln	Val	Leu	Leu	Ile	Ala	Val	Ala
	2435					2440					2445			
Val	Ser	Ser	Ala	Val	Leu	Leu	Arg	Thr	Ala	Trp	Gly	Trp	Gly	Glu
	2450					2455					2460			
Ala	Gly	Ala	Leu	Ile	Thr	Ala	Ala	Thr	Ser	Thr	Leu	Trp	Glu	Gly
	2465					2470					2475			
Ser	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser	Thr	Ala	Thr	Ser	Leu	Cys
	2480					2485					2490			
Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr
	2495					2500					2505			
Thr	Val	Thr	Arg	Asn	Ala	Gly	Leu	Val	Lys	Arg	Arg	Gly	Gly	Gly
	2510					2515					2520			
Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln
	2525					2530					2535			
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
	2540					2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
	2555					2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
	2570					2575					2580			
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	His	Gly	Lys	Val	Val
	2585					2590					2595			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
	2600					2605					2610			

Ile	Arg	Lys	Val	Gln	Glu	Val	Arg	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
2615						2620					2625			
Gly	His	Glu	Glu	Pro	Met	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile
2630						2635					2640			
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu
2645						2650					2655			
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser
2660						2665					2670			
Pro	Glu	Val	Glu	Glu	Thr	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val
2675						2680					2685			
Gly	Asp	Trp	Leu	Glu	Lys	Arg	Pro	Gly	Ala	Phe	Cys	Ile	Lys	Val
2690						2695					2700			
Leu	Cys	Pro	Tyr	Thr	Ser	Thr	Met	Met	Glu	Thr	Met	Glu	Arg	Leu
2705						2710					2715			
Gln	Arg	Arg	His	Gly	Gly	Gly	Leu	Val	Arg	Val	Pro	Leu	Ser	Arg
2720						2725					2730			
Asn	Ser	Thr	His	Glu	Met	Tyr	Trp	Val	Ser	Gly	Ala	Lys	Ser	Asn
2735						2740					2745			
Ile	Ile	Lys	Ser	Val	Ser	Thr	Thr	Ser	Gln	Leu	Leu	Leu	Gly	Arg
2750						2755					2760			
Met	Asp	Gly	Pro	Arg	Arg	Pro	Val	Lys	Tyr	Glu	Glu	Asp	Val	Asn
2765						2770					2775			
Leu	Gly	Ser	Gly	Thr	Arg	Ala	Val	Ala	Ser	Cys	Ala	Glu	Ala	Pro
2780						2785					2790			
Asn	Met	Lys	Ile	Ile	Gly	Arg	Arg	Ile	Glu	Arg	Ile	Arg	Asn	Glu
2795						2800					2805			
His	Ala	Glu	Thr	Trp	Phe	Phe	Asp	Glu	Asn	His	Pro	Tyr	Arg	Thr
2810						2815					2820			

Trp	Ala	Tyr	His	Gly	Ser	Tyr	Glu	Ala	Pro	Thr	Gln	Gly	Ser	Ala
2825						2830					2835			
Ser	Ser	Leu	Val	Asn	Gly	Val	Val	Arg	Leu	Leu	Ser	Lys	Pro	Trp
2840						2845					2850			
Asp	Val	Val	Thr	Gly	Val	Thr	Gly	Ile	Ala	Met	Thr	Asp	Thr	Thr
2855						2860					2865			
Pro	Tyr	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr	Arg
2870						2875					2880			
Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Val	Met	Asn	Met	Val
2885						2890					2895			
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	Arg	Lys	Arg	Pro	Arg
2900						2905					2910			
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala
2915						2920					2925			
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala
2930						2935					2940			
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys
2945						2950					2955			
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	His	Ser	Cys	Val	Tyr
2960						2965					2970			
Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys
2975						2980					2985			
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg
2990						2995					3000			
Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp
3005						3010					3015			

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Ile Leu Glu Glu Met Asn Arg Ala Pro Gly
3035 3040 3045

Gly Lys Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Lys Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Glu Gly His Arg Ala Leu Ala Leu Ala Val Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Gly Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

His Asp Leu Trp Leu Leu Arg Lys Pro Glu Lys Val Thr Arg Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Ser Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
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Phe His Lys Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ala Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Met
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Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

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

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
100 105 110

Ile Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
130 135 140

Ile Ser Phe Ala Thr Thr Leu Gly Val Asn Lys Cys His Val Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Ile Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu

340

345

350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
 355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
 370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
 385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
 405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
 420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Asn Arg Ala Glu Val Glu Val Thr Pro Asn Ser Pro
 450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
 465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
 485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
 500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
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Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
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Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
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Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
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Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
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Phe Gly Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val

770

775

780

Met Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Arg Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Glu Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Lys Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

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

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Ala His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

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

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

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
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Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
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Met Thr Thr Lys Ile Ile Val Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu

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Val	Ile	Leu	Met	Gly	Ala	Thr	Phe	Ala	Glu	Met	Asn	Thr	Gly	Gly	
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Asp	Val	Ala	His	Leu	Ala	Leu	Val	Ala	Ala	Phe	Lys	Val	Arg	Pro	
1220						1225					1230				
Ala	Leu	Leu	Val	Ser	Phe	Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg	
1235						1240					1245				
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala	
1250						1255					1260				
Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Val	Asn	Gly	Phe	
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Asp	Asn	Ile	Ala	Leu	Ala	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala	
1295						1300					1305				
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys	
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Gly	Gly	Phe	Met	Leu	Leu	Ser	Leu	Lys	Gly	Lys	Gly	Ser	Val	Lys	
1325						1330					1335				
Lys	Asn	Leu	Pro	Phe	Val	Met	Ala	Leu	Gly	Met	Thr	Ala	Val	Arg	
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Ser	Gly	Lys	Arg	Ser	Trp	Pro	Pro	Ser	Glu	Val	Leu	Thr	Ala	Val	
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Gly	Leu	Ile	Cys	Ala	Leu	Ala	Gly	Gly	Phe	Ala	Lys	Ala	Asp	Ile	
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Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Glu Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Ala Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ala Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

Leu Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala

1595	1600	1605
Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly 1610 1615 1620		
Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly 1625 1630 1635		
Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly 1640 1645 1650		
Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr 1655 1660 1665		
Gln Gly Lys Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro 1670 1675 1680		
Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro 1685 1690 1695		
Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu 1700 1705 1710		
Ala Ile Lys Lys Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg 1715 1720 1725		
Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Xaa Val 1730 1735 1740		
Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu 1745 1750 1755		
Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu 1760 1765 1770		
Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Asn Ile Met Asp Glu 1775 1780 1785		
Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile 1790 1795 1800		

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Thr Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys Asn Gln Glu Trp Asp Phe Val
1895 1900 1905

Ile Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Met Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Asp His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu

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Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr
2045					2050					2055				
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile
2060					2065					2070				
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Lys	Tyr	Gly	Glu
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Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser
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Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
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Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
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Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
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Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Asn Asp Ile Ala
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Val Thr Met Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Leu Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Met Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val

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2450						2455					2460				
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2465						2470					2475				
Ser	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser	Thr	Ala	Thr	Ser	Leu	Cys	
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Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr	
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Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln	
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Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr	
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Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val	
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Gly His Glu Glu Pro Met Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Thr Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Met Glu Arg Leu
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Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
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Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Ile Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Ala Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Lys Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr

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Ser	Ser	Leu	Val	Asn	Gly	Val	Val	Arg	Leu	Leu	Ser	Lys	Pro	Trp	
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2855						2860					2865				
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2870						2875					2880				
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2885						2890					2895				
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	Arg	Lys	Arg	Pro	Arg	
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Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala	
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Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala	
2930						2935					2940				
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys	
2945						2950					2955				
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	His	Ser	Cys	Val	Tyr	
2960						2965					2970				
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2975						2980					2985				
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Gln Arg Leu Gly Tyr Ile Leu Glu Glu Met Asn Arg Ala Pro Gly
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Gly Lys Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Lys Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
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Glu Glu Gly His Arg Ala Leu Ala Leu Ala Val Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Gly Gly
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Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
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Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
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Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
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Gln Asp Leu Trp Leu Leu Arg Lys Pro Glu Lys Val Thr Arg Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala Cys
3185 3190 3195

Cys Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
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Gln Glu Trp Lys Pro Ser Thr Gly Trp Ser Asn Trp Glu Glu Val

3215

3220

3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
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Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
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Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
 3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
 3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
 3290 3295 3300

Ala Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
 3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Met
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Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
 3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
 3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
 3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asp Thr Val Asn Met Val Arg
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Met Lys Asn Pro Lys Glu Glu Ile Arg Arg Ile Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Thr Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Val Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Ala Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly

355

360

365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
 370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
 385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
 405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
 420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
 435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
 450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
 465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
 485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
 500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
 515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
 530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
 545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
 565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val

785		790		795		800
Asp Phe Ser Lys	Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr	805		810		815
Asn Asp Val Asp	Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser	820		825		830
Pro Arg Arg Leu	Ala Ala Ala Val Lys Gln Ala Trp Xaa Asp Gly Ile	835		840		845
Cys Gly Ile Ser	Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser	850		855		860
Val Glu Gly Glu	Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu	865		870		875
Thr Val Val Val	Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln	885		890		895
Arg Leu Pro Val	Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp	900		905		910
Gly Lys Ser Tyr	Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val	915		920		925
Val Asp Gly Asp	Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp	930		935		940
Asn Ser Phe Leu	Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser	945		950		955
Val Trp Leu Lys	Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala	965		970		975
Val Ile Gly Thr	Ala Ala Lys Gly Lys Glu Ala Val His Ser Asp Leu	980		985		990
Gly Tyr Trp Ile	Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg	995		1000		1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Ile Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Ala Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly

1205						1210						1215			
Asp	Val	Ala	His	Leu	Ala	Leu	Ile	Ala	Ala	Phe	Lys	Val	Arg	Pro	
1220						1225					1230				
Ala	Leu	Leu	Val	Ser	Phe	Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg	
1235						1240					1245				
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala	
1250						1255					1260				
Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Ile	Asn	Gly	Phe	
1265						1270					1275				
Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Val	Val	Pro	Arg	Thr	
1280						1285					1290				
Asp	Asn	Ile	Thr	Leu	Ala	Ile	Leu	Thr	Ala	Leu	Thr	Pro	Leu	Ala	
1295						1300					1305				
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys	
1310						1315					1320				
Gly	Gly	Phe	Met	Leu	Leu	Ser	Leu	Lys	Gly	Lys	Gly	Ser	Val	Lys	
1325						1330					1335				
Lys	Asn	Leu	Pro	Phe	Val	Met	Ala	Leu	Gly	Leu	Thr	Ala	Val	Arg	
1340						1345					1350				
Leu	Val	Asp	Pro	Ile	Asn	Val	Val	Gly	Leu	Leu	Leu	Leu	Thr	Arg	
1355						1360					1365				
Ser	Gly	Lys	Arg	Ser	Trp	Pro	Pro	Ser	Glu	Val	Leu	Thr	Ala	Val	
1370						1375					1380				
Gly	Leu	Ile	Cys	Ala	Leu	Ala	Gly	Gly	Phe	Ala	Lys	Ala	Asp	Ile	
1385						1390					1395				
Glu	Met	Ala	Gly	Pro	Met	Ala	Ala	Val	Gly	Leu	Leu	Ile	Val	Ser	
1400						1405					1410				

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Pro Pro Gly Ile Phe Lys Thr Lys Asp Gly

1610						1615						1620			
Asp	Ile	Gly	Ala	Val	Ala	Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly	
1625						1630					1635				
Ser	Pro	Ile	Leu	Asp	Lys	Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly	
1640						1645					1650				
Asn	Gly	Val	Val	Ile	Lys	Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr	
1655						1660					1665				
Gln	Gly	Arg	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro	
1670						1675					1680				
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro	
1685						1690					1695				
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu	
1700						1705					1710				
Ala	Ile	Lys	Thr	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg	
1715						1720					1725				
Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro	Val	
1730						1735					1740				
Arg	Tyr	Met	Thr	Thr	Ala	Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu	
1745						1750					1755				
Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Leu	
1760						1765					1770				
Gln	Pro	Ile	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Tyr	Ile	Met	Asp	Glu	
1775						1780					1785				
Ala	His	Phe	Thr	Asp	Pro	Ser	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile	
1790						1795					1800				
Ser	Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr	
1805						1810					1815				

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Leu Lys Thr Lys Asn Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu Asp His Ala His Trp Leu Glu Ala Arg Met Leu Leu Asp Asn
1985 1990 1995

Ile Tyr Leu Gln Asp Gly Leu Ile Ala Ser Leu Tyr Arg Pro Glu
2000 2005 2010

Ala Asp Lys Val Ala Ala Ile Glu Gly Glu Phe Lys Leu Arg Thr

2015						2020						2025					
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu			
2030						2035						2040					
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr			
2045						2050						2055					
Thr	Asp	Arg	Lys	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile			
2060						2065						2070					
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Arg	Tyr	Gly	Glu			
2075						2080						2085					
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser			
2090						2095						2100					
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys			
2105						2110						2115					
Arg	Gly	Xaa	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro			
2120						2125						2130					
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala			
2135						2140						2145					
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Glu	Ala	Ala			
2150						2155						2160					
Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly			
2165						2170						2175					
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg			
2180						2185						2190					
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly			
2195						2200						2205					
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg			
2210						2215						2220					

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Ile Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Ile Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Met Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp His

2420

2425

2430

Arg Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
 2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
 2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
 2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
 2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
 2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
 2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
 2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
 2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
 2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
 2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Ile
 2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
 2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
 2615 2620 2625

Gly His Glu Glu Pro Met Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala

2825						2830						2835			
Ser	Ser	Leu	Ile	Asn	Gly	Val	Val	Arg	Leu	Leu	Ser	Lys	Pro	Trp	
2840						2845					2850				
Asp	Val	Val	Thr	Gly	Val	Thr	Gly	Ile	Ala	Met	Thr	Asp	Thr	Thr	
2855						2860					2865				
Pro	Tyr	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr	Arg	
2870						2875					2880				
Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Val	Met	Ser	Met	Val	
2885						2890					2895				
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	His	Lys	Arg	Pro	Arg	
2900						2905					2910				
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala	
2915						2920					2925				
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala	
2930						2935					2940				
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys	
2945						2950					2955				
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	Gln	Ser	Cys	Val	Tyr	
2960						2965					2970				
Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys	
2975						2980					2985				
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg	
2990						2995					3000				
Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp	
3005						3010					3015				
Met	Gly	Arg	Glu	Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu	
3020						3025					3030				

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly

3230

3235

3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Met Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

<210> 100

<211> 3423

<212> PRT

<213> Zika virus isolate Zika virus/H.sapiens-tc/PHL/2012/CPC-0740

<400> 100

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Val Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Val Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Ala Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Ile Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Ala Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
1205 1210 1215

Asp Val Ala His Leu Ala Leu Ile Ala Ala Phe Lys Val Arg Pro
1220 1225 1230

Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
1235 1240 1245

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
1250 1255 1260

Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Ile	Asn	Gly	Phe
1265						1270					1275			
Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Val	Val	Pro	Arg	Thr
1280						1285					1290			
Asp	Asn	Ile	Thr	Leu	Ala	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala
1295						1300					1305			
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys
1310						1315					1320			
Gly	Gly	Phe	Met	Leu	Leu	Ser	Leu	Lys	Gly	Lys	Gly	Ser	Val	Lys
1325						1330					1335			
Lys	Asn	Leu	Pro	Phe	Val	Met	Ala	Leu	Gly	Leu	Thr	Ala	Val	Arg
1340						1345					1350			
Leu	Val	Asp	Pro	Ile	Asn	Val	Val	Gly	Leu	Leu	Leu	Leu	Thr	Arg
1355						1360					1365			
Ser	Gly	Lys	Arg	Ser	Trp	Pro	Pro	Ser	Glu	Val	Leu	Thr	Ala	Val
1370						1375					1380			
Gly	Leu	Ile	Cys	Ala	Leu	Ala	Gly	Gly	Phe	Ala	Lys	Ala	Asp	Ile
1385						1390					1395			
Glu	Met	Ala	Gly	Pro	Met	Ala	Ala	Val	Gly	Leu	Leu	Ile	Val	Ser
1400						1405					1410			
Tyr	Val	Val	Ser	Gly	Lys	Ser	Val	Asp	Met	Tyr	Ile	Glu	Arg	Ala
1415						1420					1425			
Gly	Asp	Ile	Thr	Trp	Glu	Lys	Asp	Ala	Glu	Ile	Thr	Gly	Asn	Ser
1430						1435					1440			
Pro	Arg	Leu	Asp	Val	Ala	Leu	Asp	Glu	Ser	Gly	Asp	Phe	Ser	Leu
1445						1450					1455			
Val	Glu	Asp	Asp	Gly	Pro	Pro	Met	Arg	Glu	Ile	Ile	Leu	Lys	Val
1460						1465					1470			

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Thr Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln	Gly	Arg	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro
1670						1675					1680			
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro
1685						1690					1695			
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu
1700						1705					1710			
Ala	Ile	Lys	Thr	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg
1715						1720					1725			
Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro	Val
1730						1735					1740			
Arg	Tyr	Met	Thr	Thr	Ala	Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu
1745						1750					1755			
Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Leu
1760						1765					1770			
Gln	Pro	Ile	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Tyr	Ile	Met	Asp	Glu
1775						1780					1785			
Ala	His	Phe	Thr	Asp	Pro	Ser	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile
1790						1795					1800			
Ser	Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr
1805						1810					1815			
Ala	Thr	Pro	Pro	Gly	Thr	Arg	Asp	Ala	Phe	Pro	Asp	Ser	Asn	Ser
1820						1825					1830			
Pro	Ile	Met	Asp	Thr	Glu	Val	Glu	Val	Pro	Glu	Arg	Ala	Trp	Ser
1835						1840					1845			
Thr	Gly	Phe	Asp	Trp	Val	Thr	Asp	His	Ser	Gly	Lys	Thr	Val	Trp
1850						1855					1860			
Phe	Val	Pro	Ser	Val	Arg	Asn	Gly	Asn	Glu	Ile	Ala	Ala	Cys	Leu
1865						1870					1875			

Thr	Lys	Ala	Gly	Lys	Arg	Val	Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe
1880						1885					1890			
Glu	Thr	Glu	Phe	Gln	Lys	Thr	Lys	Asn	Gln	Glu	Trp	Asp	Phe	Val
1895						1900					1905			
Val	Thr	Thr	Asp	Ile	Ser	Glu	Met	Gly	Ala	Asn	Phe	Lys	Ala	Asp
1910						1915					1920			
Arg	Val	Ile	Asp	Ser	Arg	Arg	Cys	Leu	Lys	Pro	Val	Ile	Leu	Asp
1925						1930					1935			
Gly	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro	Met	Pro	Val	Thr	His	Ala
1940						1945					1950			
Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly	Arg	Asn	Pro	Asn	Lys
1955						1960					1965			
Pro	Gly	Asp	Glu	Tyr	Leu	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp
1970						1975					1980			
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn
1985						1990					1995			
Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu
2000						2005					2010			
Ala	Asp	Lys	Val	Ala	Ala	Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr
2015						2020					2025			
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu
2030						2035					2040			
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr
2045						2050					2055			
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Met	Thr	Asn	Asn	Thr	Ile
2060						2065					2070			

Met Glu Asp Ser Val Pro Ala Glu Val Trp Thr Arg Tyr Gly Glu
2075 2080 2085

Lys Arg Val Leu Lys Pro Arg Trp Met Asp Ala Arg Val Cys Ser
2090 2095 2100

Asp His Ala Ala Leu Lys Ser Phe Lys Glu Phe Ala Ala Gly Lys
2105 2110 2115

Arg Gly Ala Ala Phe Gly Val Ile Glu Ala Leu Gly Thr Leu Pro
2120 2125 2130

Gly His Met Thr Glu Arg Phe Gln Glu Ala Ile Asp Asn Leu Ala
2135 2140 2145

Val Leu Met Arg Ala Glu Thr Gly Ser Arg Pro Tyr Lys Ala Ala
2150 2155 2160

Ala Ala Gln Leu Pro Glu Thr Leu Glu Thr Ile Met Leu Leu Gly
2165 2170 2175

Leu Leu Gly Thr Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg
2180 2185 2190

Asn Lys Gly Met Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
2210 2215 2220

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Thr Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Met Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser	Thr	Ala	Thr	Ser	Leu	Cys
	2480					2485					2490			
Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr
	2495					2500					2505			
Thr	Val	Thr	Arg	Asn	Ala	Gly	Leu	Val	Lys	Arg	Arg	Gly	Gly	Gly
	2510					2515					2520			
Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln
	2525					2530					2535			
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
	2540					2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
	2555					2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
	2570					2575					2580			
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	Tyr	Gly	Lys	Val	Ile
	2585					2590					2595			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
	2600					2605					2610			
Ile	Arg	Lys	Val	Gln	Glu	Val	Lys	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
	2615					2620					2625			
Gly	His	Glu	Glu	Pro	Met	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile
	2630					2635					2640			
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu
	2645					2650					2655			
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser
	2660					2665					2670			
Pro	Glu	Val	Glu	Glu	Ala	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val
	2675					2680					2685			

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Val	Met	Ser	Met	Val
2885						2890					2895			
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	His	Lys	Arg	Pro	Arg
2900						2905					2910			
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala
2915						2920					2925			
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala
2930						2935					2940			
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys
2945						2950					2955			
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	Gln	Ser	Cys	Val	Tyr
2960						2965					2970			
Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys
2975						2980					2985			
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg
2990						2995					3000			
Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp
3005						3010					3015			
Met	Gly	Arg	Glu	Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu
3020						3025					3030			
Gln	Arg	Leu	Gly	Tyr	Val	Leu	Glu	Glu	Met	Ser	Arg	Ile	Pro	Gly
3035						3040					3045			
Gly	Arg	Met	Tyr	Ala	Asp	Asp	Thr	Ala	Gly	Trp	Asp	Thr	Arg	Ile
3050						3055					3060			
Ser	Arg	Phe	Asp	Leu	Glu	Asn	Glu	Ala	Leu	Ile	Thr	Asn	Gln	Met
3065						3070					3075			
Glu	Lys	Gly	His	Arg	Ala	Leu	Ala	Leu	Ala	Ile	Ile	Lys	Tyr	Thr
3080						3085					3090			

Tyr	Gln	Asn	Lys	Val	Val	Lys	Val	Leu	Arg	Pro	Ala	Glu	Lys	Gly
3095						3100					3105			
Lys	Thr	Val	Met	Asp	Ile	Ile	Ser	Arg	Gln	Asp	Gln	Arg	Gly	Ser
3110						3115					3120			
Gly	Gln	Val	Val	Thr	Tyr	Ala	Leu	Asn	Thr	Phe	Thr	Asn	Leu	Val
3125						3130					3135			
Val	Gln	Leu	Ile	Arg	Asn	Met	Glu	Ala	Glu	Glu	Val	Leu	Glu	Met
3140						3145					3150			
Gln	Asp	Leu	Trp	Leu	Leu	Arg	Arg	Pro	Glu	Lys	Val	Thr	Asn	Trp
3155						3160					3165			
Leu	Gln	Ser	Asn	Gly	Trp	Asp	Arg	Leu	Lys	Arg	Met	Ala	Val	Ser
3170						3175					3180			
Gly	Asp	Asp	Cys	Val	Val	Lys	Pro	Ile	Asp	Asp	Arg	Phe	Ala	His
3185						3190					3195			
Ala	Leu	Arg	Phe	Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Thr
3200						3205					3210			
Gln	Glu	Trp	Lys	Pro	Ser	Thr	Gly	Trp	Asp	Asn	Trp	Glu	Glu	Val
3215						3220					3225			
Pro	Phe	Cys	Ser	His	His	Phe	Asn	Lys	Leu	His	Leu	Lys	Asp	Gly
3230						3235					3240			
Arg	Ser	Ile	Val	Val	Pro	Cys	Arg	His	Gln	Asp	Glu	Leu	Ile	Gly
3245						3250					3255			
Arg	Ala	Arg	Val	Ser	Pro	Gly	Ala	Gly	Trp	Ser	Ile	Arg	Glu	Thr
3260						3265					3270			
Ala	Cys	Leu	Ala	Lys	Ser	Tyr	Ala	Gln	Met	Trp	Gln	Leu	Leu	Tyr
3275						3280					3285			

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Met Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

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<400> 101

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
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Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Thr Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr

260

265

270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
 275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
 290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
 305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
 325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
 340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
 355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
 370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
 385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
 405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
 420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
 435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
 450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
 465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Thr Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Gly Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr

690

695

700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
 705 710 715 720

Phe Gly Ser Val Gly Gly Val Leu Asn Ser Leu Gly Lys Gly Ile His
 725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
 740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
 755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
 770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
 785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
 805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
 820 825 830

Pro Arg Arg Leu Ala Ala Val Val Lys Gln Ala Trp Glu Asp Gly Ile
 835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
 850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
 865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
 885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
 900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Arg Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu

1115	1120	1125
Ile Arg Pro Arg Lys Glu 1130	Pro Glu Ser Asn Leu 1135	Val Arg Ser Met 1140
Val Thr Ala Gly Ser Thr 1145	Asp His Met Asp His 1150	Phe Ser Leu Gly 1155
Val Leu Val Ile Leu Leu 1160	Met Val Gln Glu Gly 1165	Leu Lys Lys Arg 1170
Met Thr Thr Lys Ile Ile 1175	Ile Ser Thr Ser Met 1180	Ala Val Leu Val 1185
Ala Met Ile Leu Gly Gly 1190	Phe Ser Met Ser Asp 1195	Leu Ala Lys Leu 1200
Ala Ile Leu Met Gly Ala 1205	Thr Phe Ala Glu Met 1210	Asn Thr Gly Gly 1215
Asp Val Ala His Leu Ala 1220	Leu Val Ala Ala Phe 1225	Lys Val Arg Pro 1230
Ala Leu Leu Val Ser Phe 1235	Ile Phe Arg Ala Asn 1240	Trp Thr Pro Arg 1245
Glu Ser Met Leu Leu Ala 1250	Leu Ala Ser Cys Leu 1255	Leu Gln Thr Ala 1260
Ile Ser Ala Leu Glu Gly 1265	Asp Leu Met Val Leu 1270	Ile Asn Gly Phe 1275
Ala Leu Ala Trp Leu Ala 1280	Ile Arg Ala Met Val 1285	Val Pro Arg Thr 1290
Asp Asn Ile Thr Leu Ala 1295	Ile Leu Ala Ala Leu 1300	Thr Pro Leu Ala 1305
Arg Gly Thr Leu Leu Val 1310	Ala Trp Arg Ala Gly 1315	Leu Ala Thr Cys 1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu

1520						1525						1530			
Gly	Ser	Thr	Gln	Val	Gly	Val	Gly	Val	Met	Gln	Glu	Gly	Val	Phe	
1535						1540					1545				
His	Thr	Met	Trp	His	Val	Thr	Lys	Gly	Ser	Ala	Leu	Arg	Ser	Gly	
1550						1555					1560				
Glu	Gly	Arg	Leu	Asp	Pro	Tyr	Trp	Gly	Asp	Val	Lys	Gln	Asp	Leu	
1565						1570					1575				
Val	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Ala	Ala	Trp	Asp	Gly	
1580						1585					1590				
His	Ser	Glu	Val	Gln	Leu	Leu	Ala	Val	Pro	Pro	Gly	Glu	Arg	Ala	
1595						1600					1605				
Arg	Asn	Ile	Gln	Thr	Leu	Pro	Gly	Ile	Phe	Lys	Thr	Lys	Asp	Gly	
1610						1615					1620				
Asp	Ile	Gly	Ala	Val	Ala	Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly	
1625						1630					1635				
Ser	Pro	Ile	Leu	Asp	Lys	Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly	
1640						1645					1650				
Asn	Gly	Val	Val	Ile	Lys	Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr	
1655						1660					1665				
Gln	Gly	Arg	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro	
1670						1675					1680				
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro	
1685						1690					1695				
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu	
1700						1705					1710				
Ala	Ile	Lys	Thr	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg	
1715						1720					1725				

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp

1925						1930						1935			
Gly	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro	Met	Pro	Val	Thr	His	Ala	
1940						1945					1950				
Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly	Arg	Asn	Pro	Asn	Lys	
1955						1960					1965				
Pro	Gly	Asp	Glu	Tyr	Leu	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp	
1970						1975					1980				
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn	
1985						1990					1995				
Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu	
2000						2005					2010				
Ala	Asp	Lys	Val	Ala	Ala	Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr	
2015						2020					2025				
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu	
2030						2035					2040				
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr	
2045						2050					2055				
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Met	Thr	Asn	Asn	Thr	Ile	
2060						2065					2070				
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Arg	His	Gly	Glu	
2075						2080					2085				
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser	
2090						2095					2100				
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys	
2105						2110					2115				
Arg	Gly	Ala	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro	
2120						2125					2130				

Gly His Met Thr Glu Arg Phe Gln Glu Ala Ile Asp Asn Leu Ala
2135 2140 2145

Val Leu Met Arg Ala Glu Thr Gly Ser Arg Pro Tyr Lys Ala Ala
2150 2155 2160

Ala Ala Gln Leu Pro Glu Thr Leu Glu Thr Ile Met Leu Leu Gly
2165 2170 2175

Leu Leu Gly Thr Val Ser Leu Gly Ile Phe Phe Val Leu Met Arg
2180 2185 2190

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
2210 2215 2220

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Ile Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala

2330

2335

2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
 2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
 2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
 2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
 2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
 2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
 2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
 2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
 2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
 2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
 2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
 2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
 2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
 2525 2530 2535

Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
2540						2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
2555						2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
2570						2575					2580			
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	Tyr	Gly	Lys	Val	Ile
2585						2590					2595			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
2600						2605					2610			
Ile	Arg	Lys	Val	Gln	Glu	Val	Lys	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
2615						2620					2625			
Gly	His	Glu	Glu	Pro	Met	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile
2630						2635					2640			
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu
2645						2650					2655			
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser
2660						2665					2670			
Pro	Glu	Val	Glu	Glu	Ala	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val
2675						2680					2685			
Gly	Asp	Trp	Leu	Glu	Lys	Arg	Pro	Gly	Ala	Phe	Cys	Val	Lys	Val
2690						2695					2700			
Leu	Cys	Pro	Tyr	Thr	Ser	Thr	Met	Met	Glu	Thr	Leu	Glu	Arg	Leu
2705						2710					2715			
Gln	Arg	Arg	Tyr	Gly	Gly	Gly	Leu	Val	Arg	Val	Pro	Leu	Ser	Arg
2720						2725					2730			
Asn	Ser	Thr	His	Glu	Met	Tyr	Trp	Val	Ser	Gly	Ala	Lys	Ser	Asn

2735

2740

2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
 2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
 2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
 2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
 2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
 2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
 2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
 2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
 2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
 2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Val Met Ser Met Val
 2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys His Lys Arg Pro Arg
 2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
 2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
 2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys Gln Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met

3140

3145

3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
 3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
 3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
 3185 3190 3195

Ala Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr
 3200 3205 3210

Gln Glu Trp Lys Pro Ser Thr Gly Trp Asp Asn Trp Glu Glu Val
 3215 3220 3225

Pro Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly
 3230 3235 3240

Arg Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly
 3245 3250 3255

Arg Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr
 3260 3265 3270

Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
 3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
 3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
 3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
 3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
 3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
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<223> Xaa can be any naturally occurring amino acid

<400> 102

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Asn Pro Leu Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
100 105 110

Ile Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
130 135 140

Ile Ser Phe Ala Thr Asn Leu Gly Val Asn Lys Cys His Val Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Val His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val
770 775 780

Met Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Arg Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Glu Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Lys Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Ala His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Ala Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Xaa Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Met Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Leu Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Val Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
1205 1210 1215

Asp Val Ala His Leu Ala Leu Val Ala Ala Phe Lys Val Arg Pro
1220 1225 1230

Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
1235 1240 1245

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
1250 1255 1260

Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Val Asn Gly Phe
1265 1270 1275

Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Ala Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Ala Leu Ala Ile Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
1310 1315 1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Ile	Val	Asp	Pro	Ile	Asn	Val	Val	Gly	Leu	Leu	Leu	Leu	Thr	Arg
1355						1360					1365			
Ser	Gly	Lys	Arg	Ser	Trp	Pro	Pro	Ser	Glu	Val	Leu	Thr	Ala	Val
1370						1375					1380			
Gly	Leu	Ile	Cys	Ala	Leu	Ala	Gly	Gly	Phe	Ala	Lys	Ala	Asp	Ile
1385						1390					1395			
Glu	Met	Ala	Gly	Pro	Met	Ala	Ala	Val	Gly	Leu	Leu	Ile	Val	Ser
1400						1405					1410			
Tyr	Val	Val	Ser	Gly	Lys	Ser	Val	Asp	Met	Tyr	Ile	Glu	Arg	Ala
1415						1420					1425			
Gly	Asp	Ile	Thr	Trp	Glu	Lys	Asp	Ala	Glu	Val	Thr	Gly	Asn	Ser
1430						1435					1440			
Pro	Arg	Leu	Asp	Val	Ala	Leu	Asp	Glu	Ser	Gly	Asp	Phe	Ser	Leu
1445						1450					1455			
Val	Glu	Glu	Asp	Gly	Pro	Pro	Met	Arg	Glu	Ile	Ile	Leu	Lys	Val
1460						1465					1470			
Val	Leu	Met	Ala	Ile	Cys	Gly	Met	Asn	Pro	Ile	Ala	Ile	Pro	Phe
1475						1480					1485			
Ala	Ala	Gly	Ala	Trp	Tyr	Val	Tyr	Val	Lys	Thr	Gly	Lys	Arg	Ser
1490						1495					1500			
Gly	Ala	Leu	Trp	Asp	Val	Pro	Ala	Pro	Lys	Glu	Val	Lys	Lys	Gly
1505						1510					1515			
Glu	Thr	Thr	Asp	Gly	Val	Tyr	Arg	Val	Met	Thr	Arg	Arg	Leu	Leu
1520						1525					1530			
Gly	Ser	Thr	Gln	Val	Gly	Val	Gly	Val	Met	Gln	Glu	Gly	Val	Phe
1535						1540					1545			
His	Thr	Met	Trp	His	Val	Thr	Lys	Gly	Ala	Ala	Leu	Arg	Ser	Gly
1550						1555					1560			

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

Leu Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Lys Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

Ala Ile Lys Lys Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys Asn Gln Glu Trp Asp Phe Val
1895 1900 1905

Ile Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro	Gly	Asp	Glu	Tyr	Met	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp
1970						1975					1980			
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn
1985						1990					1995			
Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu
2000						2005					2010			
Ala	Asp	Lys	Val	Ala	Ala	Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr
2015						2020					2025			
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu
2030						2035					2040			
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr
2045						2050					2055			
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile
2060						2065					2070			
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Lys	Tyr	Gly	Glu
2075						2080					2085			
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser
2090						2095					2100			
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys
2105						2110					2115			
Arg	Gly	Val	Ala	Leu	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro
2120						2125					2130			
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala
2135						2140					2145			
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
2150						2155					2160			

Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly
2165						2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
2180						2185					2190			
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
2195						2200					2205			
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
2210						2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
2225						2230					2235			
Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met
2240						2245					2250			
Ala	Ile	Ile	Ile	Met	Val	Ala	Val	Gly	Leu	Leu	Gly	Leu	Ile	Thr
2255						2260					2265			
Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Asn	Asp	Ile	Ala
2270						2275					2280			
His	Leu	Met	Gly	Arg	Arg	Glu	Glu	Gly	Val	Thr	Met	Gly	Phe	Ser
2285						2290					2295			
Met	Asp	Ile	Asp	Leu	Arg	Pro	Ala	Ser	Ala	Trp	Ala	Ile	Tyr	Ala
2300						2305					2310			
Ala	Leu	Thr	Thr	Leu	Ile	Thr	Pro	Ala	Val	Gln	His	Ala	Val	Thr
2315						2320					2325			
Thr	Ser	Tyr	Asn	Asn	Tyr	Ser	Leu	Met	Ala	Met	Ala	Thr	Gln	Ala
2330						2335					2340			
Gly	Val	Leu	Phe	Gly	Met	Gly	Lys	Gly	Met	Pro	Phe	Tyr	Ala	Trp
2345						2350					2355			
Asp	Phe	Gly	Val	Pro	Leu	Leu	Met	Met	Gly	Cys	Tyr	Ser	Gln	Leu
2360						2365					2370			

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Ile Ser Ser Ala Val Leu Leu Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro His Gly Lys Val Val
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Met Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Thr Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Met Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Val Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu	Gly	Ser	Gly	Thr	Arg	Ala	Val	Ala	Ser	Cys	Ala	Glu	Ala	Pro
2780						2785					2790			
Asn	Met	Lys	Val	Ile	Gly	Lys	Arg	Ile	Glu	Arg	Ile	Arg	Ser	Glu
2795						2800					2805			
His	Ala	Glu	Thr	Trp	Phe	Phe	Asp	Glu	Asn	His	Pro	Tyr	Arg	Thr
2810						2815					2820			
Trp	Ala	Tyr	His	Gly	Ser	Tyr	Glu	Ala	Pro	Thr	Gln	Gly	Ser	Ala
2825						2830					2835			
Ser	Ser	Leu	Val	Asn	Gly	Val	Val	Arg	Leu	Leu	Ser	Lys	Pro	Trp
2840						2845					2850			
Asp	Val	Val	Thr	Gly	Val	Thr	Gly	Ile	Ala	Met	Thr	Asp	Thr	Thr
2855						2860					2865			
Pro	Tyr	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr	Arg
2870						2875					2880			
Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Ala	Met	Asn	Met	Val
2885						2890					2895			
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	Arg	Lys	Arg	Pro	Arg
2900						2905					2910			
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala
2915						2920					2925			
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala
2930						2935					2940			
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys
2945						2950					2955			
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	His	Ser	Cys	Val	Tyr
2960						2965					2970			

Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys
2975						2980					2985			
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg
2990						2995					3000			
Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp
3005						3010					3015			
Met	Gly	Arg	Glu	Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu
3020						3025					3030			
Gln	Arg	Leu	Gly	Tyr	Ile	Leu	Glu	Glu	Met	Asn	Arg	Ala	Pro	Gly
3035						3040					3045			
Gly	Lys	Met	Tyr	Ala	Asp	Asp	Thr	Ala	Gly	Trp	Asp	Thr	Arg	Ile
3050						3055					3060			
Ser	Lys	Phe	Asp	Leu	Glu	Asn	Glu	Ala	Leu	Ile	Thr	Asn	Gln	Met
3065						3070					3075			
Glu	Glu	Gly	His	Arg	Ala	Leu	Ala	Leu	Ala	Val	Ile	Lys	Tyr	Thr
3080						3085					3090			
Lys	Asn	Lys	Val	Val	Lys	Val	Leu	Arg	Pro	Ala	Glu	Gly	Gly	Lys
3095						3100					3105			
Thr	Val	Met	Asp	Ile	Ile	Ser	Arg	Gln	Asp	Gln	Arg	Gly	Ser	Gly
3110						3115					3120			
Gln	Val	Val	Thr	Tyr	Ala	Leu	Asn	Thr	Phe	Thr	Asn	Leu	Val	Val
3125						3130					3135			
Gln	Leu	Ile	Arg	Asn	Met	Glu	Ala	Glu	Glu	Val	Leu	Glu	Met	Gln
3140						3145					3150			
Asp	Leu	Trp	Leu	Leu	Arg	Lys	Pro	Glu	Lys	Val	Thr	Arg	Trp	Leu
3155						3160					3165			
Gln	Cys	Asn	Gly	Trp	Asp	Arg	Leu	Lys	Arg	Met	Ala	Val	Ser	Gly
3170						3175					3180			

Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His Ala
3185 3190 3195

Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr Gln
3200 3205 3210

Glu Trp Lys Pro Ser Thr Gly Trp Ser Asn Trp Glu Glu Val Pro
3215 3220 3225

Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly Arg
3230 3235 3240

Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly Arg
3245 3250 3255

Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr Ala
3260 3265 3270

Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr Phe
3275 3280 3285

His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser Ala
3290 3295 3300

Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser Ile
3305 3310 3315

His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Met Val
3320 3325 3330

Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp Lys
3335 3340 3345

Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys Arg
3350 3355 3360

Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg Thr
3365 3370 3375

Thr Trp Ala Glu Asn Ile Lys Asp Thr Val Asn Met Val Arg Arg
3380 3385 3390

Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr Gln
3395 3400 3405

Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

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<211> 3417
<212> PRT
<213> Zika virus isolate ARB15076 polyprotein

<400> 103

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Asn Pro Leu Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
100 105 110

Ile Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
130 135 140

Ile Ser Phe Ala Thr Asn Leu Gly Val Asn Lys Cys His Val Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly

355

360

365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
 370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
 385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
 405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
 420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Glu Asn Arg
 435 440 445

Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu
 450 455 460

Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu
 465 470 475 480

Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu
 485 490 495

Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly
 500 505 510

Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu
 515 520 525

Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser
 530 535 540

Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu
 545 550 555 560

Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His Leu Lys Cys Arg
 565 570 575

Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys
580 585 590

Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu Thr Leu His Gly
595 600 605

Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys
610 615 620

Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly
625 630 635 640

Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser
645 650 655

Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp Ser Tyr Ile Val
660 665 670

Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp His Arg Ser Gly
675 680 685

Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg Gly Ala Lys Arg
690 695 700

Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly
705 710 715 720

Val Phe Asn Ser Leu Gly Lys Gly Ile His Gln Ile Phe Gly Ala Ala
725 730 735

Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser Gln Ile Leu Ile
740 745 750

Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys Asn Gly Ser Ile
755 760 765

Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile Phe Leu Ser Thr
770 775 780

Ala Val Ser Ala Asp Val Gly Cys Ser Val Asp Phe Ser Lys Arg Glu

785					790						795				800
Thr	Arg	Cys	Gly	Thr	Gly	Val	Phe	Val	Tyr	Asn	Asp	Val	Glu	Ala	Trp
				805					810					815	
Arg	Asp	Arg	Tyr	Lys	Tyr	His	Pro	Asp	Ser	Pro	Arg	Arg	Leu	Ala	Ala
			820					825					830		
Ala	Val	Lys	Gln	Ala	Trp	Glu	Glu	Gly	Ile	Cys	Gly	Ile	Ser	Ser	Val
		835					840					845			
Ser	Arg	Met	Glu	Asn	Ile	Met	Trp	Lys	Ser	Val	Glu	Gly	Glu	Leu	Asn
	850					855					860				
Ala	Ile	Leu	Glu	Glu	Asn	Gly	Val	Gln	Leu	Thr	Val	Val	Val	Gly	Ser
865					870					875					880
Val	Lys	Asn	Pro	Met	Trp	Arg	Gly	Pro	Gln	Arg	Leu	Pro	Val	Pro	Val
				885					890					895	
Asn	Glu	Leu	Pro	His	Gly	Trp	Lys	Ala	Trp	Gly	Lys	Ser	Tyr	Phe	Val
			900					905					910		
Arg	Ala	Ala	Lys	Thr	Asn	Asn	Arg	Phe	Val	Val	Asp	Gly	Asp	Thr	Leu
		915					920					925			
Lys	Glu	Cys	Pro	Leu	Lys	His	Arg	Ala	Trp	Asn	Ser	Phe	Leu	Val	Glu
	930					935					940				
Asp	His	Gly	Phe	Gly	Val	Phe	His	Thr	Ser	Val	Trp	Leu	Lys	Val	Arg
945					950					955					960
Glu	Asp	Tyr	Ser	Leu	Glu	Cys	Asp	Pro	Ala	Val	Ile	Gly	Thr	Ala	Val
				965					970					975	
Lys	Gly	Lys	Glu	Ala	Ala	His	Ser	Asp	Leu	Gly	Tyr	Trp	Ile	Glu	Ser
			980					985					990		
Glu	Lys	Asn	Asp	Thr	Trp	Arg	Leu	Lys	Arg	Ala	His	Leu	Ile	Glu	Met
		995					1000					1005			

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

1205						1210						1215			
Leu	Val	Ala	Ala	Phe	Lys	Val	Arg	Pro	Ala	Leu	Leu	Val	Ser	Phe	
1220						1225					1230				
Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg	Glu	Ser	Met	Leu	Leu	Ala	
1235						1240					1245				
Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala	Ile	Ser	Ala	Leu	Glu	Gly	
1250						1255					1260				
Asp	Leu	Met	Val	Leu	Val	Asn	Gly	Phe	Ala	Leu	Ala	Trp	Leu	Ala	
1265						1270					1275				
Ile	Arg	Ala	Met	Ala	Val	Pro	Arg	Thr	Asp	Asn	Ile	Ala	Leu	Ala	
1280						1285					1290				
Val	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala	Arg	Gly	Thr	Leu	Leu	Val	
1295						1300					1305				
Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys	Gly	Gly	Phe	Met	Leu	Leu	
1310						1315					1320				
Ser	Leu	Lys	Gly	Lys	Gly	Ser	Val	Lys	Lys	Asn	Leu	Pro	Phe	Val	
1325						1330					1335				
Met	Ala	Leu	Gly	Leu	Thr	Ala	Val	Arg	Ile	Val	Asp	Pro	Ile	Asn	
1340						1345					1350				
Val	Val	Gly	Leu	Leu	Leu	Leu	Thr	Arg	Ser	Gly	Lys	Arg	Ser	Trp	
1355						1360					1365				
Pro	Pro	Ser	Glu	Val	Leu	Thr	Ala	Val	Gly	Leu	Ile	Cys	Ala	Leu	
1370						1375					1380				
Ala	Gly	Gly	Phe	Ala	Lys	Ala	Asp	Ile	Glu	Met	Ala	Gly	Pro	Met	
1385						1390					1395				
Ala	Ala	Val	Gly	Leu	Leu	Ile	Val	Ser	Tyr	Val	Val	Ser	Gly	Lys	
1400						1405					1410				

Ser Val Asp Met Tyr Ile Glu Arg Ala Gly Asp Ile Thr Trp Glu
1415 1420 1425

Lys Asp Ala Glu Val Thr Gly Asn Ser Pro Arg Leu Asp Val Ala
1430 1435 1440

Leu Asp Glu Ser Gly Asp Phe Ser Leu Val Glu Glu Asp Gly Pro
1445 1450 1455

Pro Met Arg Glu Ile Ile Leu Lys Val Val Leu Met Ala Ile Cys
1460 1465 1470

Gly Met Asn Pro Ile Ala Ile Pro Phe Ala Ala Gly Ala Trp Tyr
1475 1480 1485

Val Tyr Val Lys Thr Gly Lys Arg Ser Gly Ala Leu Trp Asp Val
1490 1495 1500

Pro Ala Pro Lys Glu Val Lys Lys Gly Glu Thr Thr Asp Gly Val
1505 1510 1515

Tyr Arg Val Met Thr Arg Arg Leu Leu Gly Ser Thr Gln Val Gly
1520 1525 1530

Val Gly Val Met Gln Glu Gly Val Phe His Thr Met Trp His Val
1535 1540 1545

Thr Lys Gly Ala Ala Leu Arg Ser Gly Glu Gly Arg Leu Asp Pro
1550 1555 1560

Tyr Trp Gly Asp Val Lys Gln Asp Leu Val Ser Tyr Cys Gly Pro
1565 1570 1575

Trp Lys Leu Asp Ala Ala Trp Asp Gly Leu Ser Glu Val Gln Leu
1580 1585 1590

Leu Ala Val Pro Pro Gly Glu Arg Ala Arg Asn Ile Gln Thr Leu
1595 1600 1605

Pro Gly Ile Phe Lys Thr Lys Asp Gly Asp Ile Gly Ala Val Ala

1610						1615						1620			
Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly	Ser	Pro	Ile	Leu	Asp	Lys	
1625						1630					1635				
Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly	Asn	Gly	Val	Val	Ile	Lys	
1640						1645					1650				
Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr	Gln	Gly	Lys	Arg	Glu	Glu	
1655						1660					1665				
Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro	Ser	Met	Leu	Lys	Lys	Lys	
1670						1675					1680				
Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro	Gly	Ala	Gly	Lys	Thr	Arg	
1685						1690					1695				
Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu	Ala	Ile	Lys	Lys	Arg	Leu	
1700						1705					1710				
Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg	Val	Val	Ala	Ala	Glu	Met	
1715						1720					1725				
Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro	Val	Arg	Tyr	Met	Thr	Thr	Ala	
1730						1735					1740				
Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu	Ile	Val	Asp	Leu	Met	Cys	
1745						1750					1755				
His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Leu	Gln	Pro	Ile	Arg	Val	Pro	
1760						1765					1770				
Asn	Tyr	Asn	Leu	Tyr	Ile	Met	Asp	Glu	Ala	His	Phe	Thr	Asp	Pro	
1775						1780					1785				
Ser	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile	Ser	Thr	Arg	Val	Glu	Met	
1790						1795					1800				
Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr	Ala	Thr	Pro	Pro	Gly	Thr	
1805						1810					1815				

Arg Asp Ala Phe Pro Asp Ser Asn Ser Pro Ile Met Asp Thr Glu
1820 1825 1830

Val Glu Val Pro Glu Arg Ala Trp Ser Ser Gly Phe Asp Trp Val
1835 1840 1845

Thr Asp His Ser Gly Lys Thr Val Trp Phe Val Pro Ser Val Arg
1850 1855 1860

Asn Gly Asn Glu Ile Ala Ala Cys Leu Thr Lys Ala Gly Lys Arg
1865 1870 1875

Val Ile Gln Leu Ser Arg Lys Thr Phe Glu Thr Glu Phe Gln Lys
1880 1885 1890

Thr Lys Asn Gln Glu Trp Asp Phe Val Ile Thr Thr Asp Ile Ser
1895 1900 1905

Glu Met Gly Ala Asn Phe Lys Ala Asp Arg Val Ile Asp Ser Arg
1910 1915 1920

Arg Cys Leu Lys Pro Val Ile Leu Asp Gly Glu Arg Val Ile Leu
1925 1930 1935

Ala Gly Pro Met Pro Val Thr His Ala Ser Ala Ala Gln Arg Arg
1940 1945 1950

Gly Arg Ile Gly Arg Asn Pro Asn Lys Pro Gly Asp Glu Tyr Met
1955 1960 1965

Tyr Gly Gly Gly Cys Ala Glu Thr Asp Glu Asp His Ala His Trp
1970 1975 1980

Leu Glu Ala Arg Met Leu Leu Asp Asn Ile Tyr Leu Gln Asp Gly
1985 1990 1995

Leu Ile Ala Ser Leu Tyr Arg Pro Glu Ala Asp Lys Val Ala Ala
2000 2005 2010

Ile Glu Gly Glu Phe Lys Leu Arg Thr Glu Gln Arg Lys Thr Phe

2015	2020	2025
Val Glu Leu Met Lys Arg Gly Asp Leu Pro Val Trp Leu Ala Tyr 2030 2035 2040		
Gln Val Ala Ser Ala Gly Ile Thr Tyr Thr Asp Arg Arg Trp Cys 2045 2050 2055		
Phe Asp Gly Thr Thr Asn Asn Thr Ile Met Glu Asp Ser Val Pro 2060 2065 2070		
Ala Glu Val Trp Thr Lys Tyr Gly Glu Lys Arg Val Leu Lys Pro 2075 2080 2085		
Arg Trp Met Asp Ala Arg Val Cys Ser Asp His Ala Ala Leu Lys 2090 2095 2100		
Ser Phe Lys Glu Phe Ala Ala Gly Lys Arg Gly Ala Ala Leu Gly 2105 2110 2115		
Val Met Glu Ala Leu Gly Thr Leu Pro Gly His Met Thr Glu Arg 2120 2125 2130		
Phe Gln Glu Ala Ile Asp Asn Leu Ala Val Leu Met Arg Ala Glu 2135 2140 2145		
Thr Gly Ser Arg Pro Tyr Lys Ala Ala Ala Ala Gln Leu Pro Glu 2150 2155 2160		
Thr Leu Glu Thr Ile Met Leu Leu Gly Leu Leu Gly Thr Val Ser 2165 2170 2175		
Leu Gly Ile Phe Phe Val Leu Met Arg Asn Lys Gly Ile Gly Lys 2180 2185 2190		
Met Gly Phe Gly Met Val Thr Leu Gly Ala Ser Ala Trp Leu Met 2195 2200 2205		
Trp Leu Ser Glu Ile Glu Pro Ala Arg Ile Ala Cys Val Leu Ile 2210 2215 2220		

Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu	Ile	Pro	Glu	Pro	Glu	Lys
2225						2230					2235			
Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met	Ala	Ile	Ile	Ile	Met	Val
2240						2245					2250			
Ala	Val	Gly	Leu	Leu	Gly	Leu	Ile	Thr	Ala	Asn	Glu	Leu	Gly	Trp
2255						2260					2265			
Leu	Glu	Arg	Thr	Lys	Asn	Asp	Ile	Ala	His	Leu	Met	Gly	Arg	Arg
2270						2275					2280			
Glu	Glu	Gly	Val	Thr	Met	Gly	Phe	Ser	Met	Asp	Ile	Asp	Leu	Arg
2285						2290					2295			
Pro	Ala	Ser	Ala	Trp	Ala	Ile	Tyr	Ala	Ala	Leu	Thr	Thr	Leu	Ile
2300						2305					2310			
Thr	Pro	Ala	Val	Gln	His	Ala	Val	Thr	Thr	Ser	Tyr	Asn	Asn	Tyr
2315						2320					2325			
Ser	Leu	Met	Ala	Met	Ala	Thr	Gln	Ala	Gly	Val	Leu	Phe	Gly	Met
2330						2335					2340			
Gly	Lys	Gly	Met	Pro	Phe	Tyr	Ala	Trp	Asp	Phe	Gly	Val	Pro	Leu
2345						2350					2355			
Leu	Met	Val	Gly	Cys	Tyr	Ser	Gln	Leu	Thr	Pro	Leu	Thr	Leu	Ile
2360						2365					2370			
Val	Ala	Ile	Ile	Leu	Leu	Val	Ala	His	Tyr	Met	Tyr	Leu	Ile	Pro
2375						2380					2385			
Gly	Leu	Gln	Ala	Ala	Ala	Ala	Arg	Ala	Ala	Gln	Lys	Arg	Thr	Ala
2390						2395					2400			
Ala	Gly	Ile	Met	Lys	Asn	Pro	Val	Val	Asp	Gly	Ile	Val	Val	Thr
2405						2410					2415			
Asp	Ile	Asp	Thr	Met	Thr	Ile	Asp	Pro	Gln	Val	Glu	Lys	Lys	Met

2420

2425

2430

Gly Gln Val Leu Leu Ile Ala Val Ala Ile Ser Ser Ala Val Leu
 2435 2440 2445

Leu Arg Thr Ala Trp Gly Trp Gly Glu Ala Gly Ala Leu Ile Thr
 2450 2455 2460

Ala Ala Thr Ser Thr Leu Trp Glu Gly Ser Pro Asn Lys Tyr Trp
 2465 2470 2475

Asn Ser Ser Thr Ala Thr Ser Leu Cys Asn Ile Phe Arg Gly Ser
 2480 2485 2490

Tyr Leu Ala Gly Ala Ser Leu Ile Tyr Thr Val Thr Arg Asn Ala
 2495 2500 2505

Gly Leu Val Lys Arg Arg Gly Gly Gly Thr Gly Glu Thr Leu Gly
 2510 2515 2520

Glu Lys Trp Lys Ala Arg Leu Asn Gln Met Ser Ala Leu Glu Phe
 2525 2530 2535

Tyr Ser Tyr Lys Lys Ser Gly Ile Thr Glu Val Cys Arg Glu Glu
 2540 2545 2550

Ala Arg Arg Ala Leu Lys Asn Gly Val Ala Thr Gly Gly His Ala
 2555 2560 2565

Val Ser Arg Gly Ser Ala Lys Leu Arg Trp Leu Val Glu Arg Gly
 2570 2575 2580

Tyr Leu Gln Pro His Gly Lys Val Val Asp Leu Gly Cys Gly Arg
 2585 2590 2595

Gly Gly Trp Ser Tyr Tyr Ala Ala Thr Ile Arg Lys Val Gln Glu
 2600 2605 2610

Val Lys Gly Tyr Thr Lys Gly Gly Pro Gly His Glu Glu Pro Met
 2615 2620 2625

Leu Val Gln Ser Tyr Gly Trp Asn Ile Val Arg Leu Lys Ser Gly
2630 2635 2640

Val Asp Val Phe His Met Ala Ala Glu Pro Cys Asp Thr Leu Leu
2645 2650 2655

Cys Asp Ile Gly Glu Ser Ser Ser Ser Pro Glu Val Glu Glu Thr
2660 2665 2670

Arg Thr Leu Arg Val Leu Ser Met Val Gly Asp Trp Leu Glu Lys
2675 2680 2685

Arg Pro Gly Ala Phe Cys Ile Lys Val Leu Cys Pro Tyr Thr Ser
2690 2695 2700

Thr Met Met Glu Thr Met Glu Arg Leu Gln Arg Arg Tyr Gly Gly
2705 2710 2715

Gly Leu Val Arg Val Pro Leu Ser Arg Asn Ser Thr His Glu Met
2720 2725 2730

Tyr Trp Val Ser Gly Ala Lys Ser Asn Ile Ile Lys Ser Val Ser
2735 2740 2745

Thr Thr Ser Gln Leu Leu Leu Gly Arg Met Asp Gly Pro Arg Arg
2750 2755 2760

Pro Val Lys Tyr Glu Glu Asp Val Asn Leu Gly Ser Gly Thr Arg
2765 2770 2775

Ala Val Ala Ser Cys Ala Glu Ala Pro Asn Met Lys Ile Ile Gly
2780 2785 2790

Lys Arg Ile Glu Arg Ile Arg Ser Glu His Ala Glu Thr Trp Phe
2795 2800 2805

Phe Asp Glu Asn His Pro Tyr Arg Thr Trp Ala Tyr His Gly Ser
2810 2815 2820

Tyr Glu Ala Pro Thr Gln Gly Ser Ala Ser Ser Leu Val Asn Gly

2825

2830

2835

Val Val Arg Leu Leu Ser Lys Pro Trp Asp Val Val Thr Gly Val
2840 2845 2850

Thr Gly Ile Ala Met Thr Asp Thr Thr Pro Tyr Gly Gln Gln Arg
2855 2860 2865

Val Phe Lys Glu Lys Val Asp Thr Arg Val Pro Asp Pro Gln Glu
2870 2875 2880

Gly Thr Arg Gln Thr Met Asn Met Val Ser Ser Trp Leu Trp Lys
2885 2890 2895

Glu Leu Gly Lys Arg Lys Arg Pro Arg Val Cys Thr Lys Glu Glu
2900 2905 2910

Phe Ile Asn Lys Val Arg Ser Asn Ala Ala Leu Gly Ala Ile Phe
2915 2920 2925

Glu Glu Glu Lys Glu Trp Lys Thr Ala Val Glu Ala Val Asn Asp
2930 2935 2940

Pro Arg Phe Trp Ala Leu Val Asp Lys Glu Arg Glu His His Leu
2945 2950 2955

Arg Gly Glu Cys His Ser Cys Val Tyr Asn Met Met Gly Lys Arg
2960 2965 2970

Glu Lys Lys Gln Gly Glu Phe Gly Lys Ala Lys Gly Ser Arg Ala
2975 2980 2985

Ile Trp Tyr Met Trp Leu Gly Ala Arg Phe Leu Glu Phe Glu Ala
2990 2995 3000

Leu Gly Phe Leu Asn Glu Asp His Trp Met Gly Arg Glu Asn Ser
3005 3010 3015

Gly Gly Gly Val Glu Gly Leu Gly Leu Gln Arg Leu Gly Tyr Ile
3020 3025 3030

Leu Glu Glu Met Asn Arg Ala Pro Gly Gly Lys Met Tyr Ala Asp
3035 3040 3045

Asp Thr Ala Gly Trp Asp Thr Arg Ile Ser Lys Phe Asp Leu Glu
3050 3055 3060

Asn Glu Ala Leu Ile Thr Asn Gln Met Glu Glu Gly His Arg Ala
3065 3070 3075

Leu Ala Leu Ala Val Ile Lys Tyr Thr Tyr Gln Asn Lys Val Val
3080 3085 3090

Lys Val Leu Arg Pro Ala Glu Gly Gly Lys Thr Val Met Asp Ile
3095 3100 3105

Ile Ser Arg Gln Asp Gln Arg Gly Ser Gly Gln Val Val Thr Tyr
3110 3115 3120

Ala Leu Asn Thr Phe Thr Asn Leu Val Val Gln Leu Ile Arg Asn
3125 3130 3135

Met Glu Ala Glu Glu Val Leu Glu Met Gln Asp Leu Trp Leu Leu
3140 3145 3150

Arg Lys Pro Glu Lys Val Thr Arg Trp Leu Gln Cys Asn Gly Trp
3155 3160 3165

Asp Arg Leu Lys Arg Met Ala Val Ser Gly Asp Asp Cys Val Val
3170 3175 3180

Lys Pro Ile Asp Asp Arg Phe Ala His Ala Leu Arg Phe Leu Asn
3185 3190 3195

Asp Met Gly Lys Val Arg Lys Asp Thr Gln Glu Trp Lys Pro Ser
3200 3205 3210

Thr Gly Trp Ser Asn Trp Glu Glu Val Pro Phe Cys Ser His His
3215 3220 3225

Phe Asn Lys Leu His Leu Lys Asp Gly Arg Ser Ile Val Val Pro

3230

3235

3240

Cys Arg His Gln Asp Glu Leu Ile Gly Arg Ala Arg Val Ser Pro
 3245 3250 3255

Gly Ala Gly Trp Ser Ile Arg Glu Thr Ala Cys Leu Ala Lys Ser
 3260 3265 3270

Tyr Ala Gln Met Trp Gln Leu Leu Tyr Phe His Arg Arg Asp Leu
 3275 3280 3285

Arg Leu Met Ala Asn Ala Ile Cys Ser Ala Val Pro Val Asp Trp
 3290 3295 3300

Val Pro Thr Gly Arg Thr Thr Trp Ser Ile His Gly Lys Gly Glu
 3305 3310 3315

Trp Met Thr Thr Glu Asp Met Leu Met Val Trp Asn Arg Val Trp
 3320 3325 3330

Ile Glu Glu Asn Asp His Met Glu Asp Lys Thr Pro Val Thr Lys
 3335 3340 3345

Trp Thr Asp Ile Pro Tyr Leu Gly Lys Arg Glu Asp Leu Trp Cys
 3350 3355 3360

Gly Ser Leu Ile Gly His Arg Pro Arg Thr Thr Trp Ala Glu Asn
 3365 3370 3375

Ile Lys Asp Thr Val Asn Met Val Arg Arg Ile Ile Gly Asp Glu
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Glu Lys Tyr Met Asp Tyr Leu Ser Thr Gln Val Arg Tyr Leu Gly
 3395 3400 3405

Glu Glu Gly Ser Thr Pro Gly Val Leu
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<211> 3422

<212> PRT

<213> Zika virus isolate ARB13565 polyprotein

<400> 104

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20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
100 105 110

Ile Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
130 135 140

Ile Ser Phe Ala Thr Asn Leu Gly Val Asn Lys Cys His Val Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Val His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val
770 775 780

Met Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Arg Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Glu Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Lys Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Ala His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Ala Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
1115 1120 1125

Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Met Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Leu Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Val Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
1205 1210 1215

Asp Val Ala His Leu Ala Leu Val Ala Ala Phe Lys Val Arg Pro
1220 1225 1230

Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
1235 1240 1245

Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Leu Leu Gln Thr Ala
1250 1255 1260

Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Val Asn Gly Phe
1265 1270 1275

Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Ala Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Ala Leu Ala Ile Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
1310 1315 1320

Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Ile Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Glu Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Ala Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ala Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

Leu Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln	Gly	Lys	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro
1670						1675					1680			
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro
1685						1690					1695			
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu
1700						1705					1710			
Ala	Ile	Lys	Lys	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg
1715						1720					1725			
Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro	Val
1730						1735					1740			
Arg	Tyr	Met	Thr	Thr	Ala	Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu
1745						1750					1755			
Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Leu
1760						1765					1770			
Gln	Pro	Ile	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Tyr	Ile	Met	Asp	Glu
1775						1780					1785			
Ala	His	Phe	Thr	Asp	Pro	Ser	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile
1790						1795					1800			
Ser	Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr
1805						1810					1815			
Ala	Thr	Pro	Pro	Gly	Thr	Arg	Asp	Ala	Phe	Pro	Asp	Ser	Asn	Ser
1820						1825					1830			
Pro	Ile	Met	Asp	Thr	Glu	Val	Glu	Val	Pro	Glu	Arg	Ala	Trp	Ser
1835						1840					1845			
Ser	Gly	Phe	Asp	Trp	Val	Thr	Asp	His	Ser	Gly	Lys	Thr	Val	Trp
1850						1855					1860			
Phe	Val	Pro	Ser	Val	Arg	Asn	Gly	Asn	Glu	Ile	Ala	Ala	Cys	Leu
1865						1870					1875			

Thr	Lys	Ala	Gly	Lys	Arg	Val	Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe
1880						1885					1890			
Glu	Thr	Glu	Phe	Gln	Lys	Thr	Lys	Asn	Gln	Glu	Trp	Asp	Phe	Val
1895						1900					1905			
Ile	Thr	Thr	Asp	Ile	Ser	Glu	Met	Gly	Ala	Asn	Phe	Lys	Ala	Asp
1910						1915					1920			
Arg	Val	Ile	Asp	Ser	Arg	Arg	Cys	Leu	Lys	Pro	Val	Ile	Leu	Asp
1925						1930					1935			
Gly	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro	Met	Pro	Val	Thr	His	Ala
1940						1945					1950			
Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly	Arg	Asn	Pro	Asn	Lys
1955						1960					1965			
Pro	Gly	Asp	Glu	Tyr	Met	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp
1970						1975					1980			
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn
1985						1990					1995			
Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu
2000						2005					2010			
Ala	Asp	Lys	Val	Ala	Ala	Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr
2015						2020					2025			
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu
2030						2035					2040			
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr
2045						2050					2055			
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile
2060						2065					2070			

Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Lys	Tyr	Gly	Glu
2075						2080					2085			
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser
2090						2095					2100			
Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys
2105						2110					2115			
Arg	Gly	Val	Ala	Leu	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro
2120						2125					2130			
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala
2135						2140					2145			
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
2150						2155					2160			
Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly
2165						2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
2180						2185					2190			
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
2195						2200					2205			
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
2210						2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
2225						2230					2235			
Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met
2240						2245					2250			
Ala	Ile	Ile	Ile	Met	Val	Ala	Val	Gly	Leu	Leu	Gly	Leu	Ile	Thr
2255						2260					2265			
Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Asn	Asp	Ile	Ala
2270						2275					2280			

His Leu Met Gly Arg Arg Glu Glu Gly Val Thr Met Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Leu Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Met Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Ile Ser Ser Ala Val Leu Leu Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser	Thr	Ala	Thr	Ser	Leu	Cys
	2480					2485					2490			
Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr
	2495					2500					2505			
Thr	Val	Thr	Arg	Asn	Ala	Gly	Leu	Val	Lys	Arg	Arg	Gly	Gly	Gly
	2510					2515					2520			
Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln
	2525					2530					2535			
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
	2540					2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
	2555					2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
	2570					2575					2580			
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	His	Gly	Lys	Val	Val
	2585					2590					2595			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Ala	Ala	Thr
	2600					2605					2610			
Ile	Arg	Lys	Val	Gln	Glu	Val	Lys	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
	2615					2620					2625			
Gly	His	Glu	Glu	Pro	Met	Leu	Val	Gln	Ser	Tyr	Gly	Trp	Asn	Ile
	2630					2635					2640			
Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val	Phe	His	Met	Ala	Ala	Glu
	2645					2650					2655			
Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Ser
	2660					2665					2670			
Pro	Glu	Val	Glu	Glu	Thr	Arg	Thr	Leu	Arg	Val	Leu	Ser	Met	Val
	2675					2680					2685			

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Met Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Val Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Ala Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Val Ile Gly Lys Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Val Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

Val Pro Asp Pro Gln Glu Gly Thr Arg Gln Ala Met Asn Met Val
2885 2890 2895

Ser Ser Trp Leu Trp Lys Glu Leu Gly Lys Arg Lys Arg Pro Arg
2900 2905 2910

Val Cys Thr Lys Glu Glu Phe Ile Asn Lys Val Arg Ser Asn Ala
2915 2920 2925

Ala Leu Gly Ala Ile Phe Glu Glu Glu Lys Glu Trp Lys Thr Ala
2930 2935 2940

Val Glu Ala Val Asn Asp Pro Arg Phe Trp Ala Leu Val Asp Lys
2945 2950 2955

Glu Arg Glu His His Leu Arg Gly Glu Cys His Ser Cys Val Tyr
2960 2965 2970

Asn Met Met Gly Lys Arg Glu Lys Lys Gln Gly Glu Phe Gly Lys
2975 2980 2985

Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
2990 2995 3000

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Ile Leu Glu Glu Met Asn Arg Ala Pro Gly
3035 3040 3045

Gly Lys Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Lys Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Glu Gly His Arg Ala Leu Ala Leu Ala Val Ile Lys Tyr Thr
3080 3085 3090

Lys Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Gly Gly Lys
3095 3100 3105

Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser Gly
3110 3115 3120

Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val Val
3125 3130 3135

Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met Gln
3140 3145 3150

Asp Leu Trp Leu Leu Arg Lys Pro Glu Lys Val Thr Arg Trp Leu
3155 3160 3165

Gln Cys Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser Gly
3170 3175 3180

Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His Ala
3185 3190 3195

Leu Arg Phe Leu Asn Asp Met Gly Lys Val Arg Lys Asp Thr Gln
3200 3205 3210

Glu Trp Lys Pro Ser Thr Gly Trp Ser Asn Trp Glu Glu Val Pro
3215 3220 3225

Phe Cys Ser His His Phe Asn Lys Leu His Leu Lys Asp Gly Arg
3230 3235 3240

Ser Ile Val Val Pro Cys Arg His Gln Asp Glu Leu Ile Gly Arg
3245 3250 3255

Ala Arg Val Ser Pro Gly Ala Gly Trp Ser Ile Arg Glu Thr Ala
3260 3265 3270

Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr Phe
3275 3280 3285

His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser Ala
3290 3295 3300

Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser Ile
3305 3310 3315

His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Met Val
3320 3325 3330

Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp Lys
3335 3340 3345

Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys Arg
3350 3355 3360

Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg Thr
3365 3370 3375

Thr Trp Ala Glu Asn Ile Lys Asp Thr Val Asn Met Val Arg Arg
3380 3385 3390

Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr Gln
3395 3400 3405

Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

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<211> 3417
<212> PRT
<213> Zika virus strain MR 766 polyprotein

<400> 105

Met Lys Asn Pro Lys Lys Lys Ser Gly Gly Phe Arg Ile Val Asn Met
1 5 10 15

Leu Lys Arg Gly Val Ala Arg Val Asn Pro Leu Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Thr Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Arg Lys Arg Arg Gly Ala Asp Thr Ser Ile Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Ile Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Ser Asp Ala Gly Lys Ala
130 135 140

Ile Ser Phe Ala Thr Thr Leu Gly Val Asn Lys Cys His Val Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Lys Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Thr Leu Val Ala Val Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr

260

265

270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
 275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
 290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
 305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
 325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
 340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
 355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
 370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
 385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr
 405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
 420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Glu Asn Arg
 435 440 445

Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu
 450 455 460

Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu
 465 470 475 480

Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu
485 490 495

Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly
500 505 510

Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu
515 520 525

Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser
530 535 540

Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu
545 550 555 560

Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His Leu Lys Cys Arg
565 570 575

Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys
580 585 590

Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu Thr Leu His Gly
595 600 605

Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys
610 615 620

Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly
625 630 635 640

Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser
645 650 655

Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp Ser Tyr Ile Val
660 665 670

Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp His Arg Ser Gly
675 680 685

Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg Gly Ala Lys Arg

690

695

700

Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly
 705 710 715 720

Val Phe Asn Ser Leu Gly Lys Gly Ile His Gln Ile Phe Gly Ala Ala
 725 730 735

Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser Gln Ile Leu Ile
 740 745 750

Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys Asn Gly Ser Ile
 755 760 765

Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile Phe Leu Ser Thr
 770 775 780

Ala Val Ser Ala Asp Val Gly Cys Ser Val Asp Phe Ser Lys Lys Glu
 785 790 795 800

Thr Arg Cys Gly Thr Gly Val Phe Val Tyr Asn Asp Val Glu Ala Trp
 805 810 815

Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser Pro Arg Arg Leu Ala Ala
 820 825 830

Ala Val Lys Gln Ala Trp Glu Glu Gly Ile Cys Gly Ile Ser Ser Val
 835 840 845

Ser Arg Met Glu Asn Ile Met Trp Lys Ser Val Glu Gly Glu Leu Asn
 850 855 860

Ala Ile Leu Glu Glu Asn Gly Val Gln Leu Thr Val Val Val Gly Ser
 865 870 875 880

Val Lys Asn Pro Met Trp Arg Gly Pro Gln Arg Leu Pro Val Pro Val
 885 890 895

Asn Glu Leu Pro His Gly Trp Lys Ala Trp Gly Lys Ser Tyr Phe Val
 900 905 910

Arg Ala Ala Lys Thr Asn Asn Ser Phe Val Val Asp Gly Asp Thr Leu
915 920 925

Lys Glu Cys Pro Leu Lys His Arg Ala Trp Asn Ser Phe Leu Val Glu
930 935 940

Asp His Gly Phe Gly Val Phe His Thr Ser Val Trp Leu Lys Val Arg
945 950 955 960

Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala Val Ile Gly Thr Ala Val
965 970 975

Lys Gly Lys Glu Ala Ala His Ser Asp Leu Gly Tyr Trp Ile Glu Ser
980 985 990

Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg Ala His Leu Ile Glu Met
995 1000 1005

Lys Thr Cys Glu Trp Pro Lys Ser His Thr Leu Trp Thr Asp Gly
1010 1015 1020

Val Glu Glu Ser Asp Leu Ile Ile Pro Lys Ser Leu Ala Gly Pro
1025 1030 1035

Leu Ser His His Asn Thr Arg Glu Gly Tyr Arg Thr Gln Val Lys
1040 1045 1050

Gly Pro Trp His Ser Glu Glu Leu Glu Ile Arg Phe Glu Glu Cys
1055 1060 1065

Pro Gly Thr Lys Val His Val Glu Glu Thr Cys Gly Thr Arg Gly
1070 1075 1080

Pro Ser Leu Arg Ser Thr Thr Ala Ser Gly Arg Val Ile Glu Glu
1085 1090 1095

Trp Cys Cys Arg Glu Cys Thr Met Pro Pro Leu Ser Phe Arg Ala
1100 1105 1110

Lys Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Arg Lys Glu

1115						1120						1125			
Pro	Glu	Ser	Asn	Leu	Val	Arg	Ser	Met	Val	Thr	Ala	Gly	Ser	Thr	
1130						1135					1140				
Asp	His	Met	Asp	His	Phe	Ser	Leu	Gly	Val	Leu	Val	Ile	Leu	Leu	
1145						1150					1155				
Met	Val	Gln	Glu	Gly	Leu	Lys	Lys	Arg	Met	Thr	Thr	Lys	Ile	Ile	
1160						1165					1170				
Met	Ser	Thr	Ser	Met	Ala	Val	Leu	Val	Ala	Met	Ile	Leu	Gly	Gly	
1175						1180					1185				
Phe	Ser	Met	Ser	Asp	Leu	Ala	Lys	Leu	Val	Ile	Leu	Met	Gly	Ala	
1190						1195					1200				
Thr	Phe	Ala	Glu	Met	Asn	Thr	Gly	Gly	Asp	Val	Ala	His	Leu	Ala	
1205						1210					1215				
Leu	Val	Ala	Ala	Phe	Lys	Val	Arg	Pro	Ala	Leu	Leu	Val	Ser	Phe	
1220						1225					1230				
Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg	Glu	Ser	Met	Leu	Leu	Ala	
1235						1240					1245				
Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala	Ile	Ser	Ala	Leu	Glu	Gly	
1250						1255					1260				
Asp	Leu	Met	Val	Leu	Val	Asn	Gly	Phe	Ala	Leu	Ala	Trp	Leu	Ala	
1265						1270					1275				
Ile	Arg	Ala	Met	Ala	Val	Pro	Arg	Thr	Asp	Asn	Ile	Ala	Leu	Ala	
1280						1285					1290				
Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala	Arg	Gly	Thr	Leu	Leu	Val	
1295						1300					1305				
Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys	Gly	Gly	Phe	Met	Leu	Leu	
1310						1315					1320				

Ser Leu Lys Gly Lys Gly Ser Val Lys Lys Asn Leu Pro Phe Val
1325 1330 1335

Ala Ala Leu Gly Leu Thr Ala Val Arg Ile Val Asp Pro Ile Asn
1340 1345 1350

Val Val Gly Leu Leu Leu Leu Thr Arg Ser Gly Lys Arg Ser Trp
1355 1360 1365

Pro Pro Ser Glu Val Leu Thr Ala Val Gly Leu Ile Cys Ala Leu
1370 1375 1380

Ala Gly Gly Phe Ala Lys Ala Asp Ile Glu Met Ala Gly Pro Met
1385 1390 1395

Ala Ala Val Gly Leu Leu Ile Val Ser Tyr Val Val Ser Gly Lys
1400 1405 1410

Ser Val Asp Met Tyr Ile Glu Arg Ala Gly Asp Ile Thr Trp Glu
1415 1420 1425

Lys Asp Ala Glu Val Thr Gly Asn Ser Pro Arg Leu Asp Val Ala
1430 1435 1440

Leu Asp Glu Ser Gly Asp Phe Ser Leu Val Glu Glu Asp Gly Pro
1445 1450 1455

Pro Met Arg Glu Ile Ile Leu Lys Val Val Leu Met Ala Ile Cys
1460 1465 1470

Gly Met Asn Pro Ile Ala Ile Pro Phe Ala Ala Gly Ala Trp Tyr
1475 1480 1485

Val Tyr Val Lys Thr Gly Lys Arg Ser Gly Ala Leu Trp Asp Val
1490 1495 1500

Pro Ala Pro Lys Glu Val Lys Lys Gly Glu Thr Thr Asp Gly Val
1505 1510 1515

Tyr Arg Val Met Thr Arg Arg Leu Leu Gly Ser Thr Gln Val Gly

1520						1525						1530			
Val	Gly	Val	Met	Gln	Glu	Gly	Val	Phe	His	Thr	Met	Trp	His	Val	
1535						1540					1545				
Thr	Lys	Gly	Ala	Ala	Leu	Arg	Ser	Gly	Glu	Gly	Arg	Leu	Asp	Pro	
1550						1555					1560				
Tyr	Trp	Gly	Asp	Val	Lys	Gln	Asp	Leu	Val	Ser	Tyr	Cys	Gly	Pro	
1565						1570					1575				
Trp	Lys	Leu	Asp	Ala	Ala	Trp	Asp	Gly	Val	Ser	Glu	Val	Gln	Leu	
1580						1585					1590				
Leu	Ala	Val	Pro	Pro	Gly	Glu	Arg	Ala	Arg	Asn	Ile	Gln	Thr	Leu	
1595						1600					1605				
Pro	Gly	Ile	Phe	Lys	Thr	Lys	Asp	Gly	Asp	Ile	Gly	Ala	Val	Ala	
1610						1615					1620				
Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly	Ser	Pro	Ile	Leu	Asp	Lys	
1625						1630					1635				
Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly	Asn	Gly	Val	Val	Ile	Lys	
1640						1645					1650				
Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr	Gln	Gly	Lys	Arg	Glu	Glu	
1655						1660					1665				
Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro	Ser	Met	Leu	Lys	Lys	Lys	
1670						1675					1680				
Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro	Gly	Ala	Gly	Lys	Thr	Arg	
1685						1690					1695				
Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu	Ala	Ile	Lys	Lys	Arg	Leu	
1700						1705					1710				
Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg	Val	Val	Ala	Ala	Glu	Met	
1715						1720					1725				

Glu Glu Ala Leu Arg Gly Leu Pro Val Arg Tyr Met Thr Thr Ala
1730 1735 1740

Val Lys Val Thr His Ser Gly Thr Glu Ile Val Asp Leu Met Cys
1745 1750 1755

His Ala Thr Phe Thr Ser Arg Leu Leu Gln Pro Ile Arg Val Pro
1760 1765 1770

Asn Tyr Asn Leu Tyr Ile Met Asp Glu Ala His Phe Thr Asp Pro
1775 1780 1785

Ser Ser Ile Ala Ala Arg Gly Tyr Ile Ser Thr Arg Val Glu Met
1790 1795 1800

Gly Glu Ala Ala Ala Ile Phe Met Thr Ala Thr Pro Pro Gly Thr
1805 1810 1815

Arg Asp Ala Phe Pro Asp Ser Asn Ser Pro Ile Met Asp Thr Glu
1820 1825 1830

Val Glu Val Pro Glu Arg Ala Trp Ser Ser Gly Phe Asp Trp Val
1835 1840 1845

Thr Asp His Ser Gly Lys Thr Val Trp Phe Val Pro Ser Val Arg
1850 1855 1860

Asn Gly Asn Glu Ile Ala Ala Cys Leu Thr Lys Ala Gly Lys Arg
1865 1870 1875

Val Ile Gln Leu Ser Arg Lys Thr Phe Glu Thr Glu Phe Gln Lys
1880 1885 1890

Thr Lys Asn Gln Glu Trp Asp Phe Val Ile Thr Thr Asp Ile Ser
1895 1900 1905

Glu Met Gly Ala Asn Phe Lys Ala Asp Arg Val Ile Asp Ser Arg
1910 1915 1920

Arg Cys Leu Lys Pro Val Ile Leu Asp Gly Glu Arg Val Ile Leu

1925				1930				1935						
Ala	Gly	Pro	Met	Pro	Val	Thr	His	Ala	Ser	Ala	Ala	Gln	Arg	Arg
1940						1945					1950			
Gly	Arg	Ile	Gly	Arg	Asn	Pro	Asn	Lys	Pro	Gly	Asp	Glu	Tyr	Met
1955						1960					1965			
Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp	Glu	Asp	His	Ala	His	Trp
1970						1975					1980			
Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn	Ile	Tyr	Leu	Gln	Asp	Gly
1985						1990					1995			
Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu	Ala	Asp	Lys	Val	Ala	Ala
2000						2005					2010			
Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr	Glu	Gln	Arg	Lys	Thr	Phe
2015						2020					2025			
Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu	Pro	Val	Trp	Leu	Ala	Tyr
2030						2035					2040			
Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr	Thr	Asp	Arg	Arg	Trp	Cys
2045						2050					2055			
Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile	Met	Glu	Asp	Ser	Val	Pro
2060						2065					2070			
Ala	Glu	Val	Trp	Thr	Lys	Tyr	Gly	Glu	Lys	Arg	Val	Leu	Lys	Pro
2075						2080					2085			
Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser	Asp	His	Ala	Ala	Leu	Lys
2090						2095					2100			
Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys	Arg	Gly	Ala	Ala	Leu	Gly
2105						2110					2115			
Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro	Gly	His	Met	Thr	Glu	Arg
2120						2125					2130			

Phe Gln Glu Ala Ile Asp Asn Leu Ala Val Leu Met Arg Ala Glu
2135 2140 2145

Thr Gly Ser Arg Pro Tyr Lys Ala Ala Ala Ala Gln Leu Pro Glu
2150 2155 2160

Thr Leu Glu Thr Ile Met Leu Leu Gly Leu Leu Gly Thr Val Ser
2165 2170 2175

Leu Gly Ile Phe Phe Val Leu Met Arg Asn Lys Gly Ile Gly Lys
2180 2185 2190

Met Gly Phe Glu Met Val Thr Leu Gly Ala Ser Ala Trp Leu Met
2195 2200 2205

Trp Leu Ser Glu Ile Glu Pro Ala Arg Ile Ala Cys Val Leu Ile
2210 2215 2220

Val Val Phe Leu Leu Leu Val Val Leu Ile Pro Glu Pro Glu Lys
2225 2230 2235

Gln Arg Ser Pro Gln Asp Asn Gln Met Ala Ile Ile Ile Met Val
2240 2245 2250

Ala Val Gly Leu Leu Gly Leu Ile Thr Ala Asn Glu Leu Gly Trp
2255 2260 2265

Leu Glu Arg Thr Lys Asn Asp Ile Ala His Leu Met Gly Lys Arg
2270 2275 2280

Glu Glu Gly Thr Thr Val Gly Phe Ser Met Asp Ile Asp Leu Arg
2285 2290 2295

Pro Ala Ser Ala Trp Ala Ile Tyr Ala Ala Leu Thr Thr Leu Ile
2300 2305 2310

Thr Pro Ala Val Gln His Ala Val Thr Thr Ser Tyr Asn Asn Tyr
2315 2320 2325

Ser Leu Met Ala Met Ala Thr Gln Ala Gly Val Leu Phe Gly Met

2330

2335

2340

Gly Lys Gly Met Pro Phe Tyr Ala Trp Asp Leu Gly Val Pro Leu
 2345 2350 2355

Leu Met Met Gly Cys Tyr Ser Gln Leu Thr Pro Leu Thr Leu Ile
 2360 2365 2370

Val Ala Ile Ile Leu Leu Val Ala His Tyr Met Tyr Leu Ile Pro
 2375 2380 2385

Gly Leu Gln Ala Ala Ala Ala Arg Ala Ala Gln Lys Arg Thr Ala
 2390 2395 2400

Ala Gly Ile Met Lys Asn Pro Val Val Asp Gly Ile Val Val Thr
 2405 2410 2415

Asp Ile Asp Thr Met Thr Ile Asp Pro Gln Val Glu Lys Lys Met
 2420 2425 2430

Gly Gln Val Leu Leu Ile Ala Val Ala Val Ser Ser Ala Val Leu
 2435 2440 2445

Leu Arg Thr Ala Trp Gly Trp Gly Glu Ala Gly Ala Leu Ile Thr
 2450 2455 2460

Ala Ala Thr Ser Thr Leu Trp Glu Gly Ser Pro Asn Lys Tyr Trp
 2465 2470 2475

Asn Ser Ser Thr Ala Thr Ser Leu Cys Asn Ile Phe Arg Gly Ser
 2480 2485 2490

Tyr Leu Ala Gly Ala Ser Leu Ile Tyr Thr Val Thr Arg Asn Ala
 2495 2500 2505

Gly Leu Val Lys Arg Arg Gly Gly Gly Thr Gly Glu Thr Leu Gly
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Glu Lys Trp Lys Ala Arg Leu Asn Gln Met Ser Ala Leu Glu Phe
 2525 2530 2535

Tyr Ser Tyr Lys Lys Ser Gly Ile Thr Glu Val Cys Arg Glu Glu
2540 2545 2550

Ala Arg Arg Ala Leu Lys Asp Gly Val Ala Thr Gly Gly His Ala
2555 2560 2565

Val Ser Arg Gly Ser Ala Lys Leu Arg Trp Leu Val Glu Arg Gly
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Tyr Leu Gln Pro Tyr Gly Lys Val Val Asp Leu Gly Cys Gly Arg
2585 2590 2595

Gly Gly Trp Ser Tyr Tyr Ala Ala Thr Ile Arg Lys Val Gln Glu
2600 2605 2610

Val Arg Gly Tyr Thr Lys Gly Gly Pro Gly His Glu Glu Pro Met
2615 2620 2625

Leu Val Gln Ser Tyr Gly Trp Asn Ile Ile Arg Leu Lys Ser Gly
2630 2635 2640

Val Asp Val Phe His Met Ala Ala Glu Ser Cys Asp Thr Leu Leu
2645 2650 2655

Cys Asp Ile Gly Glu Ser Ser Ser Ser Pro Glu Val Glu Glu Thr
2660 2665 2670

Arg Thr Leu Arg Val Leu Ser Met Val Gly Asp Trp Leu Glu Lys
2675 2680 2685

Arg Pro Gly Ala Phe Cys Ile Lys Val Leu Cys Pro Tyr Thr Ser
2690 2695 2700

Thr Met Met Glu Thr Met Glu Arg Leu Gln Arg Arg Tyr Gly Gly
2705 2710 2715

Gly Leu Val Arg Val Pro Leu Ser Arg Asn Ser Thr His Glu Met
2720 2725 2730

Tyr Trp Val Ser Gly Ala Lys Ser Asn Ile Ile Lys Ser Val Ser

2735

2740

2745

Thr Thr Ser Gln Leu Leu Leu Gly Arg Met Asp Gly Pro Arg Arg
2750 2755 2760

Pro Val Lys Tyr Glu Glu Asp Val Asn Leu Gly Ser Gly Thr Arg
2765 2770 2775

Ala Val Ala Ser Cys Ala Glu Ala Pro Asn Met Lys Val Ile Gly
2780 2785 2790

Arg Arg Ile Glu Arg Ile Arg Ser Glu His Ala Glu Thr Trp Phe
2795 2800 2805

Phe Asp Glu Asn His Pro Tyr Arg Thr Trp Ala Tyr His Gly Ser
2810 2815 2820

Tyr Glu Ala Pro Thr Gln Gly Ser Ala Ser Ser Leu Val Asn Gly
2825 2830 2835

Val Val Arg Leu Leu Ser Lys Pro Trp Asp Val Val Thr Gly Val
2840 2845 2850

Thr Gly Ile Ala Met Thr Asp Thr Thr Pro Tyr Gly Gln Gln Arg
2855 2860 2865

Val Phe Lys Glu Lys Val Asp Thr Arg Val Pro Asp Pro Gln Glu
2870 2875 2880

Gly Thr Arg Gln Val Met Asn Met Val Ala Ser Trp Leu Trp Lys
2885 2890 2895

Glu Leu Gly Lys Arg Lys Arg Pro Arg Val Cys Thr Lys Glu Glu
2900 2905 2910

Phe Ile Asn Lys Val Arg Ser Asn Ala Ala Leu Gly Ala Ile Phe
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Glu Glu Glu Lys Glu Trp Lys Thr Ala Val Glu Ala Val Asn Asp
2930 2935 2940

Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys	Glu	Arg	Glu	His	His	Leu
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	2960					2965					2970			
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	2975					2980					2985			
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	2990					2995					3000			
Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp	Met	Gly	Arg	Glu	Asn	Ser
	3005					3010					3015			
Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu	Gln	Arg	Leu	Gly	Tyr	Val
	3020					3025					3030			
Leu	Glu	Glu	Met	Ser	Arg	Ala	Pro	Gly	Gly	Lys	Met	Tyr	Ala	Asp
	3035					3040					3045			
Asp	Thr	Ala	Gly	Trp	Asp	Thr	Arg	Ile	Ser	Lys	Phe	Asp	Leu	Glu
	3050					3055					3060			
Asn	Glu	Ala	Leu	Ile	Thr	Asn	Gln	Met	Asp	Glu	Gly	His	Arg	Thr
	3065					3070					3075			
Leu	Ala	Leu	Ala	Val	Ile	Lys	Tyr	Thr	Tyr	Gln	Asn	Lys	Val	Val
	3080					3085					3090			
Lys	Val	Leu	Arg	Pro	Ala	Glu	Gly	Gly	Lys	Thr	Val	Met	Asp	Ile
	3095					3100					3105			
Ile	Ser	Arg	Gln	Asp	Gln	Arg	Gly	Ser	Gly	Gln	Val	Val	Thr	Tyr
	3110					3115					3120			
Ala	Leu	Asn	Thr	Phe	Thr	Asn	Leu	Val	Val	Gln	Leu	Ile	Arg	Asn
	3125					3130					3135			
Met	Glu	Ala	Glu	Glu	Val	Leu	Glu	Met	Gln	Asp	Leu	Trp	Leu	Leu

3140

3145

3150

Arg Lys Pro Glu Lys Val Thr Arg Trp Leu Gln Ser Ser Gly Trp
 3155 3160 3165

Asp Arg Leu Lys Arg Met Ala Val Ser Gly Asp Asp Cys Val Val
 3170 3175 3180

Lys Pro Ile Asp Asp Arg Phe Ala His Ala Leu Arg Phe Leu Asn
 3185 3190 3195

Asp Met Gly Lys Val Arg Lys Asp Thr Gln Glu Trp Lys Pro Ser
 3200 3205 3210

Thr Gly Trp Ser Asn Trp Glu Glu Val Pro Phe Cys Ser His His
 3215 3220 3225

Phe Asn Lys Leu His Leu Lys Asp Gly Arg Ser Ile Val Val Pro
 3230 3235 3240

Cys Arg His Gln Asp Glu Leu Ile Gly Arg Ala Arg Val Ser Pro
 3245 3250 3255

Gly Ala Gly Trp Ser Ile Arg Glu Thr Ala Cys Leu Ala Lys Ser
 3260 3265 3270

Tyr Ala Gln Met Trp Gln Leu Leu Tyr Phe His Arg Arg Asp Leu
 3275 3280 3285

Arg Leu Met Ala Asn Ala Ile Cys Ser Ala Val Pro Val Asp Trp
 3290 3295 3300

Val Pro Thr Gly Arg Thr Thr Trp Ser Ile His Gly Lys Gly Glu
 3305 3310 3315

Trp Met Thr Thr Glu Asp Met Leu Met Val Trp Asn Arg Val Trp
 3320 3325 3330

Ile Glu Glu Asn Asp His Met Glu Asp Lys Thr Pro Val Thr Lys
 3335 3340 3345

Trp Thr Asp Ile Pro Tyr Leu Gly Lys Arg Glu Asp Leu Trp Cys
3350 3355 3360

Gly Ser Leu Ile Gly His Arg Pro Arg Thr Thr Trp Ala Glu Asn
3365 3370 3375

Ile Lys Asp Thr Val Ser Met Val Arg Arg Ile Ile Gly Asp Glu
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Glu Lys Tyr Met Asp Tyr Leu Ser Thr Gln Val Arg Tyr Leu Gly
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Glu Glu Gly Ser Thr Pro Gly Val Leu
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<212> PRT
<213> Zika virus isolate Brazil-ZKV2015

<400> 106

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Leu Lys Arg Gly Val Ala Arg Val Ser Pro Phe Gly Gly Leu Lys Arg
20 25 30

Leu Pro Ala Gly Leu Leu Leu Gly His Gly Pro Ile Arg Met Val Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Leu Gly
50 55 60

Leu Ile Asn Arg Trp Gly Ser Val Gly Lys Lys Glu Ala Met Glu Ile
65 70 75 80

Ile Lys Lys Phe Lys Lys Asp Leu Ala Ala Met Leu Arg Ile Ile Asn
85 90 95

Ala Arg Lys Glu Lys Lys Arg Arg Gly Ala Asp Thr Ser Val Gly Ile
100 105 110

Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
115 120 125

Gly Ser Ala Tyr Tyr Met Tyr Leu Asp Arg Asn Asp Ala Gly Glu Ala
130 135 140

Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
145 150 155 160

Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
165 170 175

Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
180 185 190

Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
225 230 235 240

Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
245 250 255

Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
260 265 270

Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
290 295 300

Met Ser Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys
305 310 315 320

Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
385 390 395 400

Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
405 410 415

Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
420 425 430

Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
435 440 445

Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
450 455 460

Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
500 505 510

Leu Pro Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr
530 535 540

Val Val Val Leu Gly Thr Gln Glu Gly Ala Val His Thr Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
580 585 590

Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
595 600 605

Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
610 615 620

Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
625 630 635 640

Thr Leu Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr
645 650 655

Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His
725 730 735

Gln Ile Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Ser Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn
755 760 765

Thr Lys Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val
770 775 780

Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
785 790 795 800

Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
805 810 815

Asn Asp Val Glu Ala Trp Arg Asp Arg Tyr Lys Tyr His Pro Asp Ser
820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
850 855 860

Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
865 870 875 880

Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
900 905 910

Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Leu Lys Glu Cys Pro Leu Lys His Arg Ala Trp
930 935 940

Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg
995 1000 1005

Ala His Leu Ile Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Ile Glu Glu Ser Asp Leu Ile Ile Pro
1025 1030 1035

Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr Arg Glu Gly
1040 1045 1050

Tyr Arg Thr Gln Met Lys Gly Pro Trp His Ser Glu Glu Leu Glu
1055 1060 1065

Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu Glu
1070 1075 1080

Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
1085 1090 1095

Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro
1100 1105 1110

Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu
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Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met
1130 1135 1140

Val Thr Ala Gly Ser Thr Asp His Met Asp His Phe Ser Leu Gly
1145 1150 1155

Val Leu Val Ile Leu Leu Met Val Gln Glu Gly Leu Lys Lys Arg
1160 1165 1170

Met Thr Thr Lys Ile Ile Ile Ser Thr Ser Met Ala Val Leu Val
1175 1180 1185

Ala Met Ile Leu Gly Gly Phe Ser Met Ser Asp Leu Ala Lys Leu
1190 1195 1200

Ala Ile Leu Met Gly Ala Thr Phe Ala Glu Met Asn Thr Gly Gly
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Asp Val Ala His Leu Ala Leu Ile Ala Ala Phe Lys Val Arg Pro
1220 1225 1230

Ala Leu Leu Val Ser Phe Ile Phe Arg Ala Asn Trp Thr Pro Arg
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Glu Ser Met Leu Leu Ala Leu Ala Ser Cys Phe Leu Gln Thr Ala
1250 1255 1260

Ile Ser Ala Leu Glu Gly Asp Leu Met Val Leu Ile Asn Gly Phe
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Ala Leu Ala Trp Leu Ala Ile Arg Ala Met Val Val Pro Arg Thr
1280 1285 1290

Asp Asn Ile Thr Leu Ala Ile Leu Ala Ala Leu Thr Pro Leu Ala
1295 1300 1305

Arg Gly Thr Leu Leu Val Ala Trp Arg Ala Gly Leu Ala Thr Cys
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Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
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Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
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Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
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Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Ala	Ala	Trp	Asp	Gly
1580						1585					1590			
His	Ser	Glu	Val	Gln	Leu	Leu	Ala	Val	Pro	Pro	Gly	Glu	Arg	Ala
1595						1600					1605			
Arg	Asn	Ile	Gln	Thr	Leu	Pro	Gly	Ile	Phe	Lys	Thr	Lys	Asp	Gly
1610						1615					1620			
Asp	Ile	Gly	Ala	Val	Ala	Leu	Asp	Tyr	Pro	Ala	Gly	Thr	Ser	Gly
1625						1630					1635			
Ser	Pro	Ile	Leu	Asp	Lys	Cys	Gly	Arg	Val	Ile	Gly	Leu	Tyr	Gly
1640						1645					1650			
Asn	Gly	Val	Val	Ile	Lys	Asn	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Thr
1655						1660					1665			
Gln	Gly	Arg	Arg	Glu	Glu	Glu	Thr	Pro	Val	Glu	Cys	Phe	Glu	Pro
1670						1675					1680			
Ser	Met	Leu	Lys	Lys	Lys	Gln	Leu	Thr	Val	Leu	Asp	Leu	His	Pro
1685						1690					1695			
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Glu	Ile	Val	Arg	Glu
1700						1705					1710			
Ala	Ile	Lys	Thr	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg
1715						1720					1725			
Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro	Val
1730						1735					1740			
Arg	Tyr	Met	Thr	Thr	Ala	Val	Asn	Val	Thr	His	Ser	Gly	Thr	Glu
1745						1750					1755			
Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Leu
1760						1765					1770			
Gln	Pro	Ile	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Tyr	Ile	Met	Asp	Glu
1775						1780					1785			

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Arg Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Gly Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr His Ala
1940 1945 1950

Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Asn Lys
1955 1960 1965

Pro Gly Asp Glu Tyr Leu Tyr Gly Gly Gly Cys Ala Glu Thr Asp
1970 1975 1980

Glu 1985	Asp	His	Ala	His	Trp	Leu 1990	Glu	Ala	Arg	Met	Leu 1995	Leu	Asp	Asn
Ile 2000	Tyr	Leu	Gln	Asp	Gly	Leu 2005	Ile	Ala	Ser	Leu	Tyr 2010	Arg	Pro	Glu
Ala 2015	Asp	Lys	Val	Ala	Ala	Ile 2020	Glu	Gly	Glu	Phe	Lys 2025	Leu	Arg	Thr
Glu 2030	Gln	Arg	Lys	Thr	Phe	Val 2035	Glu	Leu	Met	Lys	Arg 2040	Gly	Asp	Leu
Pro 2045	Val	Trp	Leu	Ala	Tyr	Gln 2050	Val	Ala	Ser	Ala	Gly 2055	Ile	Thr	Tyr
Thr 2060	Asp	Arg	Arg	Trp	Cys	Phe 2065	Asp	Gly	Thr	Thr	Asn 2070	Asn	Thr	Ile
Met 2075	Glu	Asp	Ser	Val	Pro	Ala 2080	Glu	Val	Trp	Thr	Arg 2085	His	Gly	Glu
Lys 2090	Arg	Val	Leu	Lys	Pro	Arg 2095	Trp	Met	Asp	Ala	Arg 2100	Val	Cys	Ser
Asp 2105	His	Ala	Ala	Leu	Lys	Ser 2110	Phe	Lys	Glu	Phe	Ala 2115	Ala	Gly	Lys
Arg 2120	Gly	Ala	Ala	Phe	Gly	Val 2125	Met	Glu	Ala	Leu	Gly 2130	Thr	Leu	Pro
Gly 2135	His	Met	Thr	Glu	Arg	Phe 2140	Gln	Glu	Ala	Ile	Asp 2145	Asn	Leu	Ala
Val 2150	Leu	Met	Arg	Ala	Glu	Thr 2155	Gly	Ser	Arg	Pro	Tyr 2160	Lys	Ala	Ala
Ala 2165	Ala	Gln	Leu	Pro	Glu	Thr 2170	Leu	Glu	Thr	Ile	Met 2175	Leu	Leu	Gly
Leu 2180	Leu	Gly	Thr	Val	Ser	Leu 2185	Gly	Ile	Phe	Phe	Val 2190	Leu	Met	Arg

Asn Lys Gly Ile Gly Lys Met Gly Phe Gly Met Val Thr Leu Gly
2195 2200 2205

Ala Ser Ala Trp Leu Met Trp Leu Ser Glu Ile Glu Pro Ala Arg
2210 2215 2220

Ile Ala Cys Val Leu Ile Val Val Phe Leu Leu Leu Val Val Leu
2225 2230 2235

Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn Gln Met
2240 2245 2250

Ala Ile Ile Ile Met Val Ala Val Gly Leu Leu Gly Leu Ile Thr
2255 2260 2265

Ala Asn Glu Leu Gly Trp Leu Glu Arg Thr Lys Ser Asp Leu Ser
2270 2275 2280

His Leu Met Gly Arg Arg Glu Glu Gly Ala Thr Ile Gly Phe Ser
2285 2290 2295

Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr	Met	Tyr	Leu	Ile	Pro	Gly	Leu	Gln	Ala	Ala	Ala	Ala	Arg	Ala
2390						2395					2400			
Ala	Gln	Lys	Arg	Thr	Ala	Ala	Gly	Ile	Met	Lys	Asn	Pro	Val	Val
2405						2410					2415			
Asp	Gly	Ile	Val	Val	Thr	Asp	Ile	Asp	Thr	Met	Thr	Ile	Asp	Pro
2420						2425					2430			
Gln	Val	Glu	Lys	Lys	Met	Gly	Gln	Val	Leu	Leu	Ile	Ala	Val	Ala
2435						2440					2445			
Val	Ser	Ser	Ala	Ile	Leu	Ser	Arg	Thr	Ala	Trp	Gly	Trp	Gly	Glu
2450						2455					2460			
Ala	Gly	Ala	Leu	Ile	Thr	Ala	Ala	Thr	Ser	Thr	Leu	Trp	Glu	Gly
2465						2470					2475			
Ser	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser	Thr	Ala	Thr	Ser	Leu	Cys
2480						2485					2490			
Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Ser	Leu	Ile	Tyr
2495						2500					2505			
Thr	Val	Thr	Arg	Asn	Ala	Gly	Leu	Val	Lys	Arg	Arg	Gly	Gly	Gly
2510						2515					2520			
Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ala	Arg	Leu	Asn	Gln
2525						2530					2535			
Met	Ser	Ala	Leu	Glu	Phe	Tyr	Ser	Tyr	Lys	Lys	Ser	Gly	Ile	Thr
2540						2545					2550			
Glu	Val	Cys	Arg	Glu	Glu	Ala	Arg	Arg	Ala	Leu	Lys	Asp	Gly	Val
2555						2560					2565			
Ala	Thr	Gly	Gly	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg
2570						2575					2580			
Trp	Leu	Val	Glu	Arg	Gly	Tyr	Leu	Gln	Pro	Tyr	Gly	Lys	Val	Ile
2585						2590					2595			

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Val Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn	Met	Lys	Ile	Ile	Gly	Asn	Arg	Ile	Glu	Arg	Ile	Arg	Ser	Glu
	2795					2800					2805			
His	Ala	Glu	Thr	Trp	Phe	Phe	Asp	Glu	Asn	His	Pro	Tyr	Arg	Thr
	2810					2815					2820			
Trp	Ala	Tyr	His	Gly	Ser	Tyr	Val	Ala	Pro	Thr	Gln	Gly	Ser	Ala
	2825					2830					2835			
Ser	Ser	Leu	Ile	Asn	Gly	Val	Val	Arg	Leu	Leu	Ser	Lys	Pro	Trp
	2840					2845					2850			
Asp	Val	Val	Thr	Gly	Val	Thr	Gly	Ile	Ala	Met	Thr	Asp	Thr	Thr
	2855					2860					2865			
Pro	Tyr	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr	Arg
	2870					2875					2880			
Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Val	Met	Ser	Met	Val
	2885					2890					2895			
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	His	Lys	Arg	Pro	Arg
	2900					2905					2910			
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala
	2915					2920					2925			
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala
	2930					2935					2940			
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys
	2945					2950					2955			
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	Gln	Ser	Cys	Val	Tyr
	2960					2965					2970			
Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys
	2975					2980					2985			
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg
	2990					2995					3000			

Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp
3005 3010 3015

Met Gly Arg Glu Asn Ser Gly Gly Gly Val Glu Gly Leu Gly Leu
3020 3025 3030

Gln Arg Leu Gly Tyr Val Leu Glu Glu Met Ser Arg Ile Pro Gly
3035 3040 3045

Gly Arg Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
3050 3055 3060

Ser Arg Phe Asp Leu Glu Asn Glu Ala Leu Ile Thr Asn Gln Met
3065 3070 3075

Glu Lys Gly His Arg Ala Leu Ala Leu Ala Ile Ile Lys Tyr Thr
3080 3085 3090

Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Ala Glu Lys Gly
3095 3100 3105

Lys Thr Val Met Asp Ile Ile Ser Arg Gln Asp Gln Arg Gly Ser
3110 3115 3120

Gly Gln Val Val Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Val
3125 3130 3135

Val Gln Leu Ile Arg Asn Met Glu Ala Glu Glu Val Leu Glu Met
3140 3145 3150

Gln Asp Leu Trp Leu Leu Arg Arg Ser Glu Lys Val Thr Asn Trp
3155 3160 3165

Leu Gln Ser Asn Gly Trp Asp Arg Leu Lys Arg Met Ala Val Ser
3170 3175 3180

Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala His
3185 3190 3195

Ala	Leu	Arg	Phe	Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Thr
3200						3205					3210			
Gln	Glu	Trp	Lys	Pro	Ser	Thr	Gly	Trp	Asp	Asn	Trp	Glu	Glu	Val
3215						3220					3225			
Pro	Phe	Cys	Ser	His	His	Phe	Asn	Lys	Leu	His	Leu	Lys	Asp	Gly
3230						3235					3240			
Arg	Ser	Ile	Val	Val	Pro	Cys	Arg	His	Gln	Asp	Glu	Leu	Ile	Gly
3245						3250					3255			
Arg	Ala	Arg	Val	Ser	Pro	Gly	Ala	Gly	Trp	Ser	Ile	Arg	Glu	Thr
3260						3265					3270			
Ala	Cys	Leu	Ala	Lys	Ser	Tyr	Ala	Gln	Met	Trp	Gln	Leu	Leu	Tyr
3275						3280					3285			
Phe	His	Arg	Arg	Asp	Leu	Arg	Leu	Met	Ala	Asn	Ala	Ile	Cys	Ser
3290						3295					3300			
Ser	Val	Pro	Val	Asp	Trp	Val	Pro	Thr	Gly	Arg	Thr	Thr	Trp	Ser
3305						3310					3315			
Ile	His	Gly	Lys	Gly	Glu	Trp	Met	Thr	Thr	Glu	Asp	Met	Leu	Val
3320						3325					3330			
Val	Trp	Asn	Arg	Val	Trp	Ile	Glu	Glu	Asn	Asp	His	Met	Glu	Asp
3335						3340					3345			
Lys	Thr	Pro	Val	Thr	Lys	Trp	Thr	Asp	Ile	Pro	Tyr	Leu	Gly	Lys
3350						3355					3360			
Arg	Glu	Asp	Leu	Trp	Cys	Gly	Ser	Leu	Ile	Gly	His	Arg	Pro	Arg
3365						3370					3375			
Thr	Thr	Trp	Ala	Glu	Asn	Ile	Lys	Asn	Thr	Val	Asn	Met	Val	Arg
3380						3385					3390			
Arg	Ile	Ile	Gly	Asp	Glu	Glu	Lys	Tyr	Met	Asp	Tyr	Leu	Ser	Thr
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Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

<210> 107
<211> 3429
<212> PRT
<213> Spondweni virus strain SM-6 V-1 polyprotein

<400> 107

Met Lys Asn Pro Lys Arg Ala Gly Ser Ser Arg Leu Val Asn Met Leu
1 5 10 15

Arg Arg Gly Ala Ala Arg Val Ile Pro Pro Gly Gly Gly Leu Lys Arg
20 25 30

Leu Pro Val Gly Leu Leu Leu Gly Arg Gly Pro Ile Lys Met Ile Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Thr Gly
50 55 60

Leu Ile Asn Arg Trp Gly Lys Val Gly Lys Lys Glu Ala Ile Lys Ile
65 70 75 80

Leu Thr Lys Phe Lys Ala Asp Val Gly Thr Met Leu Arg Ile Ile Asn
85 90 95

Asn Arg Lys Thr Lys Lys Arg Gly Val Glu Thr Gly Ile Val Phe Leu
100 105 110

Ala Leu Leu Val Ser Ile Val Ala Val Glu Val Thr Lys Lys Gly Asp
115 120 125

Thr Tyr Tyr Met Phe Ala Asp Lys Lys Asp Ala Gly Lys Val Val Thr
130 135 140

Phe Glu Thr Glu Ser Gly Pro Asn Arg Cys Ser Ile Gln Ala Met Asp
145 150 155 160

Ile Gly His Met Cys Pro Ala Thr Met Ser Tyr Glu Cys Pro Val Leu

165

170

175

Glu Pro Gln Tyr Glu Pro Glu Asp Val Asp Cys Trp Cys Asn Ser Thr
 180 185 190

Ala Ala Trp Ile Val Tyr Gly Thr Cys Thr His Lys Thr Thr Gly Glu
 195 200 205

Thr Arg Arg Ser Arg Arg Ser Ile Thr Leu Pro Ser His Ala Ser Gln
 210 215 220

Lys Leu Glu Thr Arg Ser Ser Thr Trp Leu Glu Ser Arg Glu Tyr Ser
 225 230 235 240

Lys Tyr Leu Ile Lys Val Glu Asn Trp Ile Leu Arg Asn Pro Gly Tyr
 245 250 255

Ala Leu Val Ala Ala Val Ile Gly Trp Thr Leu Gly Ser Ser Arg Ser
 260 265 270

Gln Lys Ile Ile Phe Val Thr Leu Leu Met Leu Val Ala Pro Ala Tyr
 275 280 285

Ser Ile Arg Cys Ile Gly Ile Gly Asn Arg Asp Phe Ile Glu Gly Met
 290 295 300

Ser Gly Gly Thr Trp Val Asp Ile Val Leu Glu His Gly Gly Cys Val
 305 310 315 320

Thr Val Met Ser Asn Asp Lys Pro Thr Leu Asp Phe Glu Leu Val Thr
 325 330 335

Thr Thr Ala Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala
 340 345 350

Asn Ile Ser Glu Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu
 355 360 365

Ala Tyr Leu Asp Lys Met Ala Asp Ser Gln Phe Val Cys Lys Arg Gly
 370 375 380

Tyr Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly
385 390 395 400

Ser Ile Val Thr Cys Ala Lys Phe Thr Cys Val Lys Lys Leu Thr Gly
405 410 415

Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Val Leu Val Ser Val
420 425 430

His Ala Ser Gln His Gly Gly Met Ile Asn Asn Asp Thr Asn His Gln
435 440 445

His Asp Lys Glu Asn Arg Ala Arg Ile Asp Ile Thr Ala Ser Ala Pro
450 455 460

Arg Val Glu Val Glu Leu Gly Ser Phe Gly Ser Phe Ser Met Glu Cys
465 470 475 480

Glu Pro Arg Ser Gly Leu Asn Phe Gly Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val Asn Arg Asp Trp Phe His Asp Leu Ser
500 505 510

Leu Pro Trp His Thr Gly Ala Thr Ser Asn Asn His His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Arg Glu Ala His Ala Lys Lys Gln Thr
530 535 540

Ala Val Val Leu Gly Ser Gln Glu Gly Ala Val His Ala Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Ser Asp Gly His Lys Ala Thr Ile Tyr Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Leu Asp Lys Leu Arg Leu Lys Gly
580 585 590

Met Ser Tyr Ala Leu Cys Thr Gly Ala Phe Thr Phe Ala Arg Thr Pro

595

600

605

Ser Glu Thr Ile His Gly Thr Ala Thr Val Glu Leu Gln Tyr Ala Gly
 610 615 620

Glu Asp Gly Pro Cys Lys Val Pro Ile Val Ile Thr Ser Asp Thr Asn
 625 630 635 640

Ser Met Ala Ser Thr Gly Arg Leu Ile Thr Ala Asn Pro Val Val Thr
 645 650 655

Glu Ser Gly Ala Asn Ser Lys Met Met Val Glu Ile Asp Pro Pro Phe
 660 665 670

Gly Asp Ser Tyr Ile Ile Val Gly Thr Gly Thr Thr Lys Ile Thr His
 675 680 685

His Trp His Arg Ala Gly Ser Ser Ile Gly Arg Ala Phe Glu Ala Thr
 690 695 700

Met Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
 705 710 715 720

Phe Gly Ser Val Gly Gly Met Phe Asn Ser Val Gly Lys Phe Val His
 725 730 735

Gln Val Phe Gly Ser Ala Phe Lys Ala Leu Phe Gly Gly Met Ser Trp
 740 745 750

Phe Thr Gln Leu Leu Ile Gly Phe Leu Leu Ile Trp Met Gly Leu Asn
 755 760 765

Ala Arg Gly Gly Thr Val Ala Met Ser Phe Met Gly Ile Gly Ala Met
 770 775 780

Leu Ile Phe Leu Ala Thr Ser Val Ser Gly Asp Thr Gly Cys Ser Val
 785 790 795 800

Asp Ile Ser Arg Arg Glu Met Arg Cys Gly Ser Gly Ile Phe Val Tyr
 805 810 815

Asn Asp Val Asp Ala Trp Arg Ser Arg Tyr Lys Tyr His Pro Glu Thr
820 825 830

Pro Arg Ala Leu Ala Ala Ala Val Lys Thr Ala Trp Glu Glu Gly Thr
835 840 845

Cys Gly Ile Thr Ser Val Ser Arg Met Glu Asn Leu Met Trp Ser Ser
850 855 860

Val Ala Gly Glu Leu Asn Ala Ile Leu Glu Asp Asn Ser Val Pro Leu
865 870 875 880

Thr Val Val Val Gly Glu Pro Lys Tyr Pro Leu Tyr Asn Ala Pro Lys
885 890 895

Arg Leu Lys Pro Pro Ala Ser Glu Leu Pro Gln Gly Trp Lys Ser Trp
900 905 910

Gly Lys Ser Tyr Phe Val Ser Ala Ala Lys Asn Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Met Lys Glu Cys Pro Arg Gln Lys Arg Ala Trp
930 935 940

Asn Ser Leu Arg Ile Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Ile Trp Leu Lys Phe His Glu Asp Asn Ser Thr Glu Cys Asp Thr Ala
965 970 975

Ile Ile Gly Thr Ala Val Arg Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Arg Asn Asp Thr Trp Arg Leu Ser Arg
995 1000 1005

Ala His Leu Ile Glu Ala Lys Thr Cys Glu Trp Pro Arg Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Glu Leu Ile Ile Pro

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

Ala Met Leu Val Ser Phe Met Phe Arg Ala Leu Trp Thr Pro Arg
1235 1240 1245

Glu Ser Leu Leu Leu Ala Leu Ala Ala Cys Leu Leu Gln Val Ser
1250 1255 1260

Val Thr Pro Leu Asp His Ser Ile Met Ile Val Val Asp Gly Ile
1265 1270 1275

Ala Leu Ser Trp Leu Cys Leu Lys Ala Ile Leu Val Pro Arg Thr
1280 1285 1290

Pro Asn Ile Ala Leu Pro Leu Leu Ala Met Leu Ser Pro Met Leu
1295 1300 1305

Gln Gly Thr Thr Ile Val Ala Trp Arg Ala Met Met Ala Ala Leu
1310 1315 1320

Ala Val Ile Thr Leu Ala Ser Met Lys His Gly Arg Gly Val Lys
1325 1330 1335

Lys Thr Phe Pro Tyr Thr Ile Gly Cys Ile Leu Gly Ser Met Gly
1340 1345 1350

Leu Val Glu Asn Leu Gly Leu Val Gly Leu Leu Leu Leu Thr Ala
1355 1360 1365

Ser Lys Lys Arg Ser Trp Pro Pro Ser Glu Val Met Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Ile Val Gly Gly Leu Thr Lys Thr Asp Ile
1385 1390 1395

Asp Met Ala Gly Pro Met Ala Ala Ile Gly Leu Leu Val Val Ser
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Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Lys Val
1415 1420 1425

Cys Asp Ile Ser Trp Asp Lys Asp Ala Glu Ile Thr Gly Thr Ser

1430						1435						1440			
Pro	Arg	Leu	Asp	Val	Ala	Leu	Asp	Asp	Ser	Gly	Asp	Phe	Ser	Leu	
1445						1450					1455				
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1460						1465					1470				
Phe	Leu	Met	Cys	Val	Cys	Gly	Val	Ser	Pro	Ile	Ala	Ile	Pro	Phe	
1475						1480					1485				
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1490						1495					1500				
Gly	Ala	Met	Trp	Asp	Ile	Pro	Ser	Pro	Arg	Glu	Val	Lys	Lys	Gly	
1505						1510					1515				
Glu	Thr	Thr	Ala	Gly	Val	Tyr	Arg	Ile	Met	Thr	Arg	Lys	Leu	Leu	
1520						1525					1530				
Gly	Ser	Thr	Gln	Val	Gly	Ala	Gly	Val	Met	His	Glu	Gly	Val	Phe	
1535						1540					1545				
His	Thr	Met	Trp	His	Val	Thr	Lys	Gly	Ser	Ala	Leu	Arg	Ser	Gly	
1550						1555					1560				
Glu	Gly	Arg	Leu	Asp	Pro	Tyr	Trp	Gly	Asn	Val	Lys	Gln	Asp	Leu	
1565						1570					1575				
Ile	Ser	Tyr	Cys	Gly	Pro	Trp	Lys	Leu	Asp	Gly	Lys	Trp	Asp	Gly	
1580						1585					1590				
Val	Ser	Glu	Val	Gln	Leu	Ile	Ala	Val	Ala	Pro	Gly	Glu	Arg	Ala	
1595						1600					1605				
Arg	Asn	Val	Gln	Thr	Lys	Pro	Gly	Val	Phe	Lys	Thr	Thr	Asp	Gly	
1610						1615					1620				
Glu	Ile	Gly	Ala	Leu	Ala	Leu	Asp	Phe	Pro	Gly	Gly	Ser	Ser	Gly	
1625						1630					1635				

Ser	Pro	Ile	Ile	Asp	Lys	Asn	Gly	His	Val	Ile	Gly	Leu	Tyr	Gly
1640						1645					1650			
Asn	Gly	Val	Val	Val	Lys	Ser	Gly	Ser	Tyr	Val	Ser	Ala	Ile	Met
1655						1660					1665			
Gln	Thr	Glu	Lys	Met	Glu	Glu	Pro	Ala	Val	Asp	Cys	Phe	Glu	Glu
1670						1675					1680			
Asp	Met	Leu	Arg	Lys	Lys	Lys	Leu	Thr	Val	Leu	Asp	Leu	His	Pro
1685						1690					1695			
Gly	Ala	Gly	Lys	Thr	Arg	Arg	Val	Leu	Pro	Gln	Ile	Val	Lys	Ala
1700						1705					1710			
Ala	Ile	Lys	Lys	Arg	Leu	Arg	Thr	Val	Ile	Leu	Ala	Pro	Thr	Arg
1715						1720					1725			
Val	Val	Ala	Ala	Glu	Met	Ala	Glu	Ala	Leu	Lys	Asp	Leu	Pro	Ile
1730						1735					1740			
Arg	Tyr	Met	Thr	Pro	Ala	Val	Ser	Ala	Thr	His	Asp	Gly	Asn	Glu
1745						1750					1755			
Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Ser	Arg	Leu	Met
1760						1765					1770			
Gln	Pro	Ile	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Tyr	Ile	Met	Asp	Glu
1775						1780					1785			
Ala	His	Phe	Thr	Asp	Pro	Ala	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile
1790						1795					1800			
Ala	Thr	Arg	Val	Asp	Met	Gly	Asp	Ala	Ala	Ala	Ile	Phe	Met	Thr
1805						1810					1815			
Ala	Thr	Pro	Pro	Gly	Ser	Thr	Glu	Ala	Phe	Pro	Asp	Ser	Asn	Ala
1820						1825					1830			
Pro	Ile	Thr	Asp	Val	Glu	Thr	Glu	Val	Pro	Asp	Lys	Ala	Trp	Asn

1835	1840	1845
Ser Gly Phe Glu Trp Ile Thr Asp Tyr Pro Gly Lys Thr Val Trp 1850 1855 1860		
Phe Val Pro Ser Val Arg Met Gly Asn Glu Ile Ser Ala Cys Leu 1865 1870 1875		
Thr Lys Ala Gly Lys Ser Val Ile Gln Leu Ser Arg Lys Thr Phe 1880 1885 1890		
Glu Thr Glu Tyr Gln Lys Thr Lys Asn Gly Glu Trp Asp Phe Val 1895 1900 1905		
Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp 1910 1915 1920		
Arg Val Ile Asp Ser Arg Lys Cys Leu Lys Pro Val Ile Leu Asp 1925 1930 1935		
Asp Met Glu Glu Arg Val Val Leu Ala Gly Pro Met Ala Val Thr 1940 1945 1950		
Pro Ser Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro 1955 1960 1965		
Asn Lys Thr Gly Asp Glu Phe Tyr Tyr Gly Gly Gly Cys Ala Ala 1970 1975 1980		
Thr Asp Asp Asp His Ala His Trp Val Glu Ala Arg Met Leu Leu 1985 1990 1995		
Asp Asn Ile Tyr Leu Gln Asp Asn Leu Val Ala Ser Leu Tyr Lys 2000 2005 2010		
Pro Glu Gln Gly Lys Val Ser Ala Ile Glu Gly Glu Phe Lys Leu 2015 2020 2025		
Arg Gly Glu Gln Arg Lys Thr Phe Val Glu Leu Met Lys Arg Gly 2030 2035 2040		

Asp Leu Pro Val Trp Leu Ser Tyr Gln Val Ala Ala Ser Gly Leu
2045 2050 2055

Ser Tyr Thr Asp Arg Arg Trp Cys Phe Asp Gly Lys Asn Asn Asn
2060 2065 2070

Thr Ile Leu Glu Asp Cys Val Pro Val Glu Val Trp Thr Lys Phe
2075 2080 2085

Gly Glu Lys Lys Ile Leu Lys Pro Arg Trp Met Asp Ala Arg Ile
2090 2095 2100

Cys Ser Asp His Ala Ser Leu Lys Ser Phe Lys Glu Phe Ala Ala
2105 2110 2115

Gly Lys Arg Thr Ile Ala Thr Gly Leu Ile Glu Ala Phe Gly Met
2120 2125 2130

Leu Pro Gly His Met Thr Glu Arg Phe Gln Glu Ala Val Asp Asn
2135 2140 2145

Leu Ala Val Leu Met Arg Ala Glu Ala Gly Ser Arg Ala His Arg
2150 2155 2160

Met Ala Ala Ala Gln Leu Pro Glu Thr Met Glu Thr Ile Leu Leu
2165 2170 2175

Leu Ser Leu Leu Ala Phe Val Ser Leu Gly Val Phe Phe Val Leu
2180 2185 2190

Met Arg Ala Lys Gly Leu Gly Lys Met Gly Ser Gly Met Ile Val
2195 2200 2205

Leu Ala Gly Ser Gly Trp Leu Met Trp Met Ser Glu Val Glu Pro
2210 2215 2220

Ala Arg Ile Ala Cys Val Val Ile Ile Val Phe Leu Leu Met Val
2225 2230 2235

Val Leu Ile Pro Glu Pro Glu Lys Gln Arg Ser Pro Gln Asp Asn

2240						2245						2250			
Gln	Leu	Ala	Leu	Ile	Ile	Leu	Ile	Ala	Thr	Gly	Leu	Ile	Thr	Leu	
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Ile	Ala	Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Ser	Asp	
2270						2275					2280				
Leu	Thr	Arg	Leu	Phe	Trp	Arg	Glu	His	Ala	Glu	Pro	Thr	Gly	Gly	
2285						2290					2295				
Arg	Gly	Phe	Ser	Phe	Ser	Leu	Asp	Ile	Asp	Leu	Arg	Pro	Ala	Ser	
2300						2305					2310				
Ala	Trp	Ala	Ile	Tyr	Ala	Ala	Met	Thr	Thr	Leu	Ile	Thr	Pro	Thr	
2315						2320					2325				
Val	Gln	His	Ala	Val	Thr	Thr	Ser	Tyr	Asn	Asn	Tyr	Ser	Leu	Met	
2330						2335					2340				
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Gly	Cys	Tyr	Ser	Gln	Leu	Thr	Pro	Leu	Thr	Leu	Ile	Val	Ala	Leu	
2375						2380					2385				
Val	Met	Leu	Ala	Ala	His	Tyr	Leu	Tyr	Leu	Ile	Pro	Gly	Leu	Gln	
2390						2395					2400				
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Met	Lys	Asn	Pro	Val	Val	Asp	Gly	Ile	Val	Val	Thr	Asp	Ile	Asp	
2420						2425					2430				
Pro	Ile	Gln	Ile	Asp	Pro	Asn	Val	Glu	Lys	Lys	Met	Gly	Gln	Val	
2435						2440					2445				

Met	Leu	Ile	Phe	Val	Ala	Leu	Ala	Ser	Ala	Val	Leu	Met	Arg	Thr
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Ala	Trp	Gly	Trp	Gly	Glu	Ala	Gly	Ala	Leu	Ala	Ser	Ala	Ala	Ala
2465						2470					2475			
Ala	Thr	Leu	Trp	Glu	Gly	Ala	Pro	Asn	Lys	Tyr	Trp	Asn	Ser	Ser
2480						2485					2490			
Thr	Ala	Thr	Ser	Leu	Cys	Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala
2495						2500					2505			
Gly	Pro	Ser	Leu	Ile	Tyr	Thr	Val	Thr	Arg	Asn	Ala	Gly	Ile	Met
2510						2515					2520			
Lys	Lys	Arg	Gly	Gly	Gly	Asn	Gly	Glu	Thr	Val	Gly	Glu	Lys	Trp
2525						2530					2535			
Lys	Glu	Arg	Leu	Asn	Arg	Met	Thr	Ala	Leu	Glu	Phe	Tyr	Ala	Tyr
2540						2545					2550			
Lys	Arg	Ser	Gly	Ile	Thr	Glu	Val	Cys	Arg	Glu	Pro	Ala	Arg	Arg
2555						2560					2565			
Ala	Leu	Lys	Asp	Gly	Val	Val	Thr	Gly	Gly	His	Ala	Val	Ser	Arg
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Leu	Val	Gly	Arg	Val	Val	Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp
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Ser	Tyr	Tyr	Ala	Ala	Ser	Gln	Lys	Gln	Val	Leu	Glu	Val	Arg	Gly
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Tyr	Thr	Lys	Gly	Gly	Ala	Gly	His	Glu	Glu	Pro	Met	Asn	Val	Gln
2630						2635					2640			
Ser	Tyr	Gly	Trp	Asn	Ile	Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val

2645						2650						2655			
Phe	Tyr	Leu	Pro	Ser	Glu	Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	
2660						2665					2670				
Gly	Glu	Ser	Ser	Ser	Ser	Pro	Ala	Val	Glu	Glu	Ala	Arg	Thr	Leu	
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2690						2695					2700				
Asn	Phe	Cys	Ile	Lys	Val	Leu	Cys	Pro	Tyr	Thr	Ser	Ala	Met	Ile	
2705						2710					2715				
Glu	Arg	Leu	Glu	Ala	Leu	Gln	Arg	Arg	Tyr	Gly	Gly	Gly	Leu	Val	
2720						2725					2730				
Arg	Val	Pro	Leu	Ser	Arg	Asn	Ser	Thr	His	Glu	Met	Tyr	Trp	Val	
2735						2740					2745				
Ser	Gly	Ala	Lys	Ser	Asn	Ile	Ile	Arg	Ser	Val	Asn	Ala	Thr	Ser	
2750						2755					2760				
Gln	Leu	Leu	Met	His	Arg	Met	Asp	Ile	Pro	Thr	Arg	Lys	Thr	Lys	
2765						2770					2775				
Phe	Glu	Glu	Asp	Val	Asn	Leu	Gly	Thr	Gly	Thr	Arg	Ala	Val	Glu	
2780						2785					2790				
Ser	Arg	Ala	Asp	Pro	Pro	Asp	Met	Lys	Lys	Leu	Gly	Ser	Arg	Ile	
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Asn	His	Pro	Tyr	Arg	Thr	Trp	His	Tyr	His	Gly	Ser	Tyr	Glu	Ala	
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Leu Leu Ser Lys Pro Trp Asp Ala Leu Ser Ser Val Thr Asn Ile
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Ala Met Thr Asp Thr Thr Pro Phe Gly Gln Gln Arg Val Phe Lys
2870 2875 2880

Glu Lys Val Asp Thr Arg Thr Pro Asp Pro Lys Gln Gly Thr Gln
2885 2890 2895

Arg Val Met Ala Ile Thr Ser Gln Trp Leu Trp Asp Arg Leu Ala
2900 2905 2910

Arg Asn Lys Thr Pro Arg Met Cys Thr Arg Gln Glu Phe Ile Asn
2915 2920 2925

Lys Val Asn Ser His Ala Ala Leu Gly Pro Val Phe Arg Glu Gln
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Gln Gly Trp Gly Ser Ala Ala Glu Ala Val Val Asp Pro Arg Phe
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Trp Glu Leu Val Asp Asn Glu Arg Glu Ala His Leu Arg Gly Glu
2960 2965 2970

Cys Leu Thr Cys Val Tyr Asn Met Met Gly Lys Arg Glu Lys Lys
2975 2980 2985

Leu Gly Glu Phe Gly Lys Ala Lys Gly Ser Arg Ala Ile Trp Tyr
2990 2995 3000

Met Trp Leu Gly Ala Arg Phe Leu Glu Phe Glu Ala Leu Gly Phe
3005 3010 3015

Leu Asn Glu Asp His Trp Leu Ser Arg Glu Asn Ser Gly Gly Gly
3020 3025 3030

Val Glu Gly Leu Gly Leu Gln Lys Leu Gly Tyr Ile Leu Glu Glu
3035 3040 3045

Ile Ser Arg Arg Pro Gly Gly Lys Met Tyr Ala Asp Asp Thr Ala

3050

3055

3060

Gly Trp Asp Thr Arg Ile Thr Lys Cys Asp Leu Glu Asn Glu Ala
3065 3070 3075

Arg Ile Leu Glu Lys Met Asp Gly Ile His Lys Lys Leu Ala Arg
3080 3085 3090

Ala Val Ile Glu Leu Thr Tyr Lys His Lys Val Val Arg Val Leu
3095 3100 3105

Arg Pro Ala Pro Gln Gly Lys Val Val Met Asp Ile Ile Ser Arg
3110 3115 3120

Pro Asp Gln Arg Gly Ser Gly Gln Val Val Thr Tyr Ala Leu Asn
3125 3130 3135

Thr Tyr Thr Asn Leu Val Val Gln Leu Ile Arg Asn Met Glu Ala
3140 3145 3150

Glu Ala Val Ile Asn Glu Arg Asp Met Glu Glu Leu Gln Asn Pro
3155 3160 3165

Trp Lys Val Ile Asn Trp Leu Glu Gly Asn Gly Trp Asp Arg Leu
3170 3175 3180

Arg Ser Met Ala Val Ser Gly Asp Asp Cys Val Val Lys Pro Met
3185 3190 3195

Asp Asp Arg Phe Ala Tyr Ala Leu Asn Phe Leu Asn Asp Met Gly
3200 3205 3210

Lys Val Arg Lys Asp Val Gln Glu Trp Lys Pro Ser Pro Gly Trp
3215 3220 3225

Thr Asn Trp Glu Glu Val Pro Phe Cys Ser His His Phe Asn Lys
3230 3235 3240

Leu Pro Met Lys Asp Gly Arg Thr Ile Ile Val Pro Cys Arg His
3245 3250 3255

Gln Asp Glu Leu Ile Gly Arg Ala Arg Val Ser Pro Gly Lys Gly
3260 3265 3270

Trp Ser Leu Ser Glu Thr Ala Cys Leu Gly Lys Ser Tyr Ala Gln
3275 3280 3285

Met Trp Leu Leu Leu Tyr Phe His Arg Arg Asp Leu Arg Leu Met
3290 3295 3300

Ala Asn Ala Ile Cys Ser Ala Val Pro Val Ser Trp Val Pro Thr
3305 3310 3315

Gly Arg Thr Thr Trp Ser Ile His Gly Arg Gly Glu Trp Met Thr
3320 3325 3330

Thr Glu Asp Met Leu Glu Val Trp Asn Arg Val Trp Ile Ile Glu
3335 3340 3345

Asn Glu Tyr Met Glu Asp Lys Thr Pro Val Thr Glu Trp Thr Asp
3350 3355 3360

Val Pro Tyr Leu Gly Lys Arg Glu Asp Leu Trp Cys Gly Ser Leu
3365 3370 3375

Ile Gly His Arg Pro Arg Ser Thr Trp Ala Glu Asn Ile Trp Ala
3380 3385 3390

Ala Ile Tyr Gln Val Arg Arg Ala Ile Gly Glu Thr Glu Glu Tyr
3395 3400 3405

Arg Asp Tyr Met Ser Thr Gln Val Arg Tyr Gly Ser Glu Glu Gly
3410 3415 3420

Pro Ser Ala Gly Val Leu
3425

<210> 108

<211> 3429

<212> PRT

<213> Spondweni virus, NCBI Reference Sequence: NC_029055.1

<400> 108

Met Lys Asn Pro Lys Arg Ala Gly Ser Ser Arg Leu Val Asn Met Leu
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Arg Arg Gly Ala Ala Arg Val Ile Pro Pro Gly Gly Gly Leu Lys Arg
20 25 30

Leu Pro Val Gly Leu Leu Leu Gly Arg Gly Pro Ile Lys Met Ile Leu
35 40 45

Ala Ile Leu Ala Phe Leu Arg Phe Thr Ala Ile Lys Pro Ser Thr Gly
50 55 60

Leu Ile Asn Arg Trp Gly Lys Val Gly Lys Lys Glu Ala Ile Lys Ile
65 70 75 80

Leu Thr Lys Phe Lys Ala Asp Val Gly Thr Met Leu Arg Ile Ile Asn
85 90 95

Asn Arg Lys Thr Lys Lys Arg Gly Val Glu Thr Gly Ile Val Phe Leu
100 105 110

Ala Leu Leu Val Ser Ile Val Ala Val Glu Val Thr Lys Lys Gly Asp
115 120 125

Thr Tyr Tyr Met Phe Ala Asp Lys Lys Asp Ala Gly Lys Val Val Thr
130 135 140

Phe Glu Thr Glu Ser Gly Pro Asn Arg Cys Ser Ile Gln Ala Met Asp
145 150 155 160

Ile Gly His Met Cys Pro Ala Thr Met Ser Tyr Glu Cys Pro Val Leu
165 170 175

Glu Pro Gln Tyr Glu Pro Glu Asp Val Asp Cys Trp Cys Asn Ser Thr
180 185 190

Ala Ala Trp Ile Val Tyr Gly Thr Cys Thr His Lys Thr Thr Gly Glu
195 200 205

Thr Arg Arg Ser Arg Arg Ser Ile Thr Leu Pro Ser His Ala Ser Gln
210 215 220

Lys Leu Glu Thr Arg Ser Ser Thr Trp Leu Glu Ser Arg Glu Tyr Ser
225 230 235 240

Lys Tyr Leu Ile Lys Val Glu Asn Trp Ile Leu Arg Asn Pro Gly Tyr
245 250 255

Ala Leu Val Ala Ala Val Ile Gly Trp Thr Leu Gly Ser Ser Arg Ser
260 265 270

Gln Lys Ile Ile Phe Val Thr Leu Leu Met Leu Val Ala Pro Ala Tyr
275 280 285

Ser Ile Arg Cys Ile Gly Ile Gly Asn Arg Asp Phe Ile Glu Gly Met
290 295 300

Ser Gly Gly Thr Trp Val Asp Ile Val Leu Glu His Gly Gly Cys Val
305 310 315 320

Thr Val Met Ser Asn Asp Lys Pro Thr Leu Asp Phe Glu Leu Val Thr
325 330 335

Thr Thr Ala Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala
340 345 350

Asn Ile Ser Glu Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu
355 360 365

Ala Tyr Leu Asp Lys Met Ala Asp Ser Gln Phe Val Cys Lys Arg Gly
370 375 380

Tyr Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly
385 390 395 400

Ser Ile Val Thr Cys Ala Lys Phe Thr Cys Val Lys Lys Leu Thr Gly
405 410 415

Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Val Leu Val Ser Val
420 425 430

His Ala Ser Gln His Gly Gly Met Ile Asn Asn Asp Thr Asn His Gln
435 440 445

His Asp Lys Glu Asn Arg Ala Arg Ile Asp Ile Thr Ala Ser Ala Pro
450 455 460

Arg Val Glu Val Glu Leu Gly Ser Phe Gly Ser Phe Ser Met Glu Cys
465 470 475 480

Glu Pro Arg Ser Gly Leu Asn Phe Gly Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val Asn Arg Asp Trp Phe His Asp Leu Ser
500 505 510

Leu Pro Trp His Thr Gly Ala Thr Ser Asn Asn His His Trp Asn Asn
515 520 525

Lys Glu Ala Leu Val Glu Phe Arg Glu Ala His Ala Lys Lys Gln Thr
530 535 540

Ala Val Val Leu Gly Ser Gln Glu Gly Ala Val His Ala Ala Leu Ala
545 550 555 560

Gly Ala Leu Glu Ala Glu Ser Asp Gly His Lys Ala Thr Ile Tyr Ser
565 570 575

Gly His Leu Lys Cys Arg Leu Lys Leu Asp Lys Leu Arg Leu Lys Gly
580 585 590

Met Ser Tyr Ala Leu Cys Thr Gly Ala Phe Thr Phe Ala Arg Thr Pro
595 600 605

Ser Glu Thr Ile His Gly Thr Ala Thr Val Glu Leu Gln Tyr Ala Gly
610 615 620

Glu Asp Gly Pro Cys Lys Val Pro Ile Val Ile Thr Ser Asp Thr Asn
625 630 635 640

Ser Met Ala Ser Thr Gly Arg Leu Ile Thr Ala Asn Pro Val Val Thr
645 650 655

Glu Ser Gly Ala Asn Ser Lys Met Met Val Glu Ile Asp Pro Pro Phe
660 665 670

Gly Asp Ser Tyr Ile Ile Val Gly Thr Gly Thr Thr Lys Ile Thr His
675 680 685

His Trp His Arg Ala Gly Ser Ser Ile Gly Arg Ala Phe Glu Ala Thr
690 695 700

Met Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
705 710 715 720

Phe Gly Ser Val Gly Gly Met Phe Asn Ser Val Gly Lys Phe Val His
725 730 735

Gln Val Phe Gly Ser Ala Phe Lys Ala Leu Phe Gly Gly Met Ser Trp
740 745 750

Phe Thr Gln Leu Leu Ile Gly Phe Leu Leu Ile Trp Met Gly Leu Asn
755 760 765

Ala Arg Gly Gly Thr Val Ala Met Ser Phe Met Gly Ile Gly Ala Met
770 775 780

Leu Ile Phe Leu Ala Thr Ser Val Ser Gly Asp Thr Gly Cys Ser Val
785 790 795 800

Asp Ile Ser Arg Arg Glu Met Arg Cys Gly Ser Gly Ile Phe Val Tyr
805 810 815

Asn Asp Val Asp Ala Trp Arg Ser Arg Tyr Lys Tyr His Pro Glu Thr
820 825 830

Pro Arg Ala Leu Ala Ala Ala Val Lys Thr Ala Trp Glu Glu Gly Thr
835 840 845

Cys Gly Ile Thr Ser Val Ser Arg Met Glu Asn Leu Met Trp Ser Ser
850 855 860

Val Ala Gly Glu Leu Asn Ala Ile Leu Glu Asp Asn Ser Val Pro Leu
865 870 875 880

Thr Val Val Val Gly Glu Pro Lys Tyr Pro Leu Tyr Asn Ala Pro Lys
885 890 895

Arg Leu Lys Pro Pro Ala Ser Glu Leu Pro Gln Gly Trp Lys Ser Trp
900 905 910

Gly Lys Ser Tyr Phe Val Ser Ala Ala Lys Asn Asn Asn Ser Phe Val
915 920 925

Val Asp Gly Asp Thr Met Lys Glu Cys Pro Arg Gln Lys Arg Ala Trp
930 935 940

Asn Ser Leu Arg Ile Glu Asp His Gly Phe Gly Val Phe His Thr Ser
945 950 955 960

Ile Trp Leu Lys Phe His Glu Asp Asn Ser Thr Glu Cys Asp Thr Ala
965 970 975

Ile Ile Gly Thr Ala Val Arg Gly Lys Glu Ala Val His Ser Asp Leu
980 985 990

Gly Tyr Trp Ile Glu Ser Glu Arg Asn Asp Thr Trp Arg Leu Ser Arg
995 1000 1005

Ala His Leu Ile Glu Ala Lys Thr Cys Glu Trp Pro Arg Ser His
1010 1015 1020

Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Glu Leu Ile Ile Pro
1025 1030 1035

Arg Gly Leu Ala Gly Pro Phe Ser His His Asn Thr Arg Ala Gly
1040 1045 1050

Tyr Lys Thr Gln Asn Lys Gly Pro Trp His Leu Gly Asp Val Glu
1055 1060 1065

Ile	Gln	Phe	Ala	Thr	Cys	Pro	Gly	Thr	Thr	Val	Val	Gln	Asp	Gln
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Glu	Cys	Arg	Asp	Arg	Gly	Ala	Ser	Leu	Arg	Thr	Thr	Thr	Ala	Ser
1085						1090					1095			
Gly	Arg	Val	Ile	Asn	Glu	Trp	Cys	Cys	Arg	Ser	Cys	Thr	Met	Pro
1100						1105					1110			
Pro	Leu	Ser	Phe	Lys	Thr	Lys	Asp	Gly	Cys	Trp	Tyr	Ala	Met	Glu
1115						1120					1125			
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1130						1135					1140			
Val	Thr	Ala	Gly	Ser	Thr	Asp	His	Met	Asp	His	Phe	Ser	Leu	Gly
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1160						1165					1170			
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1175						1180					1185			
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1190						1195					1200			
Val	Val	Leu	Val	Gly	Ala	Ala	Phe	Ala	Glu	Met	Asn	Thr	Gly	Gly
1205						1210					1215			
Asp	Val	Ala	His	Leu	Ala	Leu	Val	Ala	Ala	Phe	Lys	Val	Arg	Pro
1220						1225					1230			
Ala	Met	Leu	Val	Ser	Phe	Met	Phe	Arg	Ala	Leu	Trp	Thr	Pro	Arg
1235						1240					1245			
Glu	Ser	Leu	Leu	Leu	Ala	Leu	Ala	Ala	Cys	Leu	Leu	Gln	Val	Ser
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Val	Thr	Pro	Leu	Asp	His	Ser	Ile	Met	Ile	Val	Val	Asp	Gly	Ile
1265						1270					1275			

Ala Leu Ser Trp Leu Cys Leu Lys Ala Ile Leu Val Pro Arg Thr
1280 1285 1290

Pro Asn Ile Ala Leu Pro Leu Leu Ala Met Leu Ser Pro Met Leu
1295 1300 1305

Gln Gly Thr Thr Ile Val Ala Trp Arg Ala Met Met Ala Ala Leu
1310 1315 1320

Ala Val Ile Thr Leu Ala Ser Met Lys His Gly Arg Gly Val Lys
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Lys Thr Phe Pro Tyr Thr Ile Gly Cys Ile Leu Gly Ser Met Gly
1340 1345 1350

Leu Val Glu Asn Leu Gly Leu Val Gly Leu Leu Leu Leu Thr Ala
1355 1360 1365

Ser Lys Lys Arg Ser Trp Pro Pro Ser Glu Val Met Thr Ala Val
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Gly Leu Ile Cys Ala Ile Val Gly Gly Leu Thr Lys Thr Asp Ile
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Asp Met Ala Gly Pro Met Ala Ala Ile Gly Leu Leu Val Val Ser
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Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Lys Val
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Cys Asp Ile Ser Trp Asp Lys Asp Ala Glu Ile Thr Gly Thr Ser
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Pro Arg Leu Asp Val Ala Leu Asp Asp Ser Gly Asp Phe Ser Leu
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Ile Gln Asp Asp Gly Pro Pro Thr Arg Glu Ile Val Leu Lys Val
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Phe Leu Met Cys Val Cys Gly Val Ser Pro Ile Ala Ile Pro Phe
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Ala Ala Ala Ala Trp Phe Val Tyr Ile Lys Ser Gly Lys Arg Ser
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Gly Ala Met Trp Asp Ile Pro Ser Pro Arg Glu Val Lys Lys Gly
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Glu Thr Thr Ala Gly Val Tyr Arg Ile Met Thr Arg Lys Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Ala Gly Val Met His Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asn Val Lys Gln Asp Leu
1565 1570 1575

Ile Ser Tyr Cys Gly Pro Trp Lys Leu Asp Gly Lys Trp Asp Gly
1580 1585 1590

Val Ser Glu Val Gln Leu Ile Ala Val Ala Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Val Gln Thr Lys Pro Gly Val Phe Lys Thr Thr Asp Gly
1610 1615 1620

Glu Ile Gly Ala Leu Ala Leu Asp Phe Pro Gly Gly Ser Ser Gly
1625 1630 1635

Ser Pro Ile Ile Asp Lys Asn Gly His Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Val Lys Ser Gly Ser Tyr Val Ser Ala Ile Met
1655 1660 1665

Gln Thr Glu Lys Met Glu Glu Pro Ala Val Asp Cys Phe Glu Glu
1670 1675 1680

Asp Met Leu Arg Lys Lys Lys Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Gln Ile Val Lys Ala
1700 1705 1710

Ala Ile Lys Lys Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Ala Glu Ala Leu Lys Asp Leu Pro Ile
1730 1735 1740

Arg Tyr Met Thr Pro Ala Val Ser Ala Thr His Asp Gly Asn Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Met
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ala Thr Arg Val Asp Met Gly Asp Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Ser Thr Glu Ala Phe Pro Asp Ser Asn Ala
1820 1825 1830

Pro Ile Thr Asp Val Glu Thr Glu Val Pro Asp Lys Ala Trp Asn
1835 1840 1845

Ser Gly Phe Glu Trp Ile Thr Asp Tyr Pro Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Met Gly Asn Glu Ile Ser Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Ser Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Tyr Gln Lys Thr Lys Asn Gly Glu Trp Asp Phe Val
1895 1900 1905

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Asp
1910 1915 1920

Arg Val Ile Asp Ser Arg Lys Cys Leu Lys Pro Val Ile Leu Asp
1925 1930 1935

Asp Met Glu Glu Arg Val Val Leu Ala Gly Pro Met Ala Val Thr
1940 1945 1950

Pro Ser Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro
1955 1960 1965

Asn Lys Thr Gly Asp Glu Phe Tyr Tyr Gly Gly Gly Cys Ala Ala
1970 1975 1980

Thr Asp Asp Asp His Ala His Trp Val Glu Ala Arg Met Leu Leu
1985 1990 1995

Asp Asn Ile Tyr Leu Gln Asp Asn Leu Val Ala Ser Leu Tyr Lys
2000 2005 2010

Pro Glu Gln Gly Lys Val Ser Ala Ile Glu Gly Glu Phe Lys Leu
2015 2020 2025

Arg Gly Glu Gln Arg Lys Thr Phe Val Glu Leu Met Lys Arg Gly
2030 2035 2040

Asp Leu Pro Val Trp Leu Ser Tyr Gln Val Ala Ala Ser Gly Leu
2045 2050 2055

Ser Tyr Thr Asp Arg Arg Trp Cys Phe Asp Gly Lys Asn Asn Asn
2060 2065 2070

Thr Ile Leu Glu Asp Cys Val Pro Val Glu Val Trp Thr Lys Phe
2075 2080 2085

Gly	Glu	Lys	Lys	Ile	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Ile
2090						2095					2100			
Cys	Ser	Asp	His	Ala	Ser	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala
2105						2110					2115			
Gly	Lys	Arg	Thr	Ile	Ala	Thr	Gly	Leu	Ile	Glu	Ala	Phe	Gly	Met
2120						2125					2130			
Leu	Pro	Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Val	Asp	Asn
2135						2140					2145			
Leu	Ala	Val	Leu	Met	Arg	Ala	Glu	Ala	Gly	Ser	Arg	Ala	His	Arg
2150						2155					2160			
Met	Ala	Ala	Ala	Gln	Leu	Pro	Glu	Thr	Met	Glu	Thr	Ile	Leu	Leu
2165						2170					2175			
Leu	Ser	Leu	Leu	Ala	Phe	Val	Ser	Leu	Gly	Val	Phe	Phe	Val	Leu
2180						2185					2190			
Met	Arg	Ala	Lys	Gly	Leu	Gly	Lys	Met	Gly	Ser	Gly	Met	Ile	Val
2195						2200					2205			
Leu	Ala	Gly	Ser	Gly	Trp	Leu	Met	Trp	Met	Ser	Glu	Val	Glu	Pro
2210						2215					2220			
Ala	Arg	Ile	Ala	Cys	Val	Val	Ile	Ile	Val	Phe	Leu	Leu	Met	Val
2225						2230					2235			
Val	Leu	Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn
2240						2245					2250			
Gln	Leu	Ala	Leu	Ile	Ile	Leu	Ile	Ala	Thr	Gly	Leu	Ile	Thr	Leu
2255						2260					2265			
Ile	Ala	Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Ser	Asp
2270						2275					2280			

Leu Thr Arg Leu Phe Trp Arg Glu His Ala Glu Pro Thr Gly Gly
2285 2290 2295

Arg Gly Phe Ser Phe Ser Leu Asp Ile Asp Leu Arg Pro Ala Ser
2300 2305 2310

Ala Trp Ala Ile Tyr Ala Ala Met Thr Thr Leu Ile Thr Pro Thr
2315 2320 2325

Val Gln His Ala Val Thr Thr Ser Tyr Asn Asn Tyr Ser Leu Met
2330 2335 2340

Ala Met Ala Thr Gln Ala Gly Val Leu Phe Gly Met Gly Arg Gly
2345 2350 2355

Val Pro Phe Tyr Lys Trp Asp Phe Gly Val Pro Leu Leu Met Leu
2360 2365 2370

Gly Cys Tyr Ser Gln Leu Thr Pro Leu Thr Leu Ile Val Ala Leu
2375 2380 2385

Val Met Leu Ala Ala His Tyr Leu Tyr Leu Ile Pro Gly Leu Gln
2390 2395 2400

Ala Thr Ala Ala Arg Ala Ala Gln Arg Arg Thr Ala Ala Gly Ile
2405 2410 2415

Met Lys Asn Pro Val Val Asp Gly Ile Val Val Thr Asp Ile Asp
2420 2425 2430

Pro Ile Gln Ile Asp Pro Asn Val Glu Lys Lys Met Gly Gln Val
2435 2440 2445

Met Leu Ile Phe Val Ala Leu Ala Ser Ala Val Leu Met Arg Thr
2450 2455 2460

Ala Trp Gly Trp Gly Glu Ala Gly Ala Leu Ala Ser Ala Ala Ala
2465 2470 2475

Ala Thr Leu Trp Glu Gly Ala Pro Asn Lys Tyr Trp Asn Ser Ser
2480 2485 2490

Thr	Ala	Thr	Ser	Leu	Cys	Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala
2495						2500					2505			
Gly	Pro	Ser	Leu	Ile	Tyr	Thr	Val	Thr	Arg	Asn	Ala	Gly	Ile	Met
2510						2515					2520			
Lys	Lys	Arg	Gly	Gly	Gly	Asn	Gly	Glu	Thr	Val	Gly	Glu	Lys	Trp
2525						2530					2535			
Lys	Glu	Arg	Leu	Asn	Arg	Met	Thr	Ala	Leu	Glu	Phe	Tyr	Ala	Tyr
2540						2545					2550			
Lys	Arg	Ser	Gly	Ile	Thr	Glu	Val	Cys	Arg	Glu	Pro	Ala	Arg	Arg
2555						2560					2565			
Ala	Leu	Lys	Asp	Gly	Val	Val	Thr	Gly	Gly	His	Ala	Val	Ser	Arg
2570						2575					2580			
Gly	Ser	Ala	Lys	Leu	Arg	Trp	Met	Val	Glu	Arg	Gly	His	Val	Asn
2585						2590					2595			
Leu	Val	Gly	Arg	Val	Val	Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp
2600						2605					2610			
Ser	Tyr	Tyr	Ala	Ala	Ser	Gln	Lys	Gln	Val	Leu	Glu	Val	Arg	Gly
2615						2620					2625			
Tyr	Thr	Lys	Gly	Gly	Ala	Gly	His	Glu	Glu	Pro	Met	Asn	Val	Gln
2630						2635					2640			
Ser	Tyr	Gly	Trp	Asn	Ile	Val	Arg	Leu	Lys	Ser	Gly	Val	Asp	Val
2645						2650					2655			
Phe	Tyr	Leu	Pro	Ser	Glu	Pro	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile
2660						2665					2670			
Gly	Glu	Ser	Ser	Ser	Ser	Pro	Ala	Val	Glu	Glu	Ala	Arg	Thr	Leu
2675						2680					2685			

Arg Val Leu Gly Met Val Glu Thr Trp Leu Glu Arg Gly Val Lys
2690 2695 2700

Asn Phe Cys Ile Lys Val Leu Cys Pro Tyr Thr Ser Ala Met Ile
2705 2710 2715

Glu Arg Leu Glu Ala Leu Gln Arg Arg Tyr Gly Gly Gly Leu Val
2720 2725 2730

Arg Val Pro Leu Ser Arg Asn Ser Thr His Glu Met Tyr Trp Val
2735 2740 2745

Ser Gly Ala Lys Ser Asn Ile Ile Arg Ser Val Asn Ala Thr Ser
2750 2755 2760

Gln Leu Leu Met His Arg Met Asp Ile Pro Thr Arg Lys Thr Lys
2765 2770 2775

Phe Glu Glu Asp Val Asn Leu Gly Thr Gly Thr Arg Ala Val Glu
2780 2785 2790

Ser Arg Ala Asp Pro Pro Asp Met Lys Lys Leu Gly Ser Arg Ile
2795 2800 2805

Glu Arg Leu Arg Lys Glu Tyr Gly Ser Thr Trp His Tyr Asp Glu
2810 2815 2820

Asn His Pro Tyr Arg Thr Trp His Tyr His Gly Ser Tyr Glu Ala
2825 2830 2835

Asp Thr Gln Gly Ser Ala Ser Ser Met Val Asn Gly Val Val Arg
2840 2845 2850

Leu Leu Ser Lys Pro Trp Asp Ala Leu Ser Ser Val Thr Asn Ile
2855 2860 2865

Ala Met Thr Asp Thr Thr Pro Phe Gly Gln Gln Arg Val Phe Lys
2870 2875 2880

Glu Lys Val Asp Thr Arg Thr Pro Asp Pro Lys Gln Gly Thr Gln
2885 2890 2895

Arg Val Met Ala Ile Thr Ser Gln Trp Leu Trp Asp Arg Leu Ala
2900 2905 2910

Arg Asn Lys Thr Pro Arg Met Cys Thr Arg Gln Glu Phe Ile Asn
2915 2920 2925

Lys Val Asn Ser His Ala Ala Leu Gly Pro Val Phe Arg Glu Gln
2930 2935 2940

Gln Gly Trp Gly Ser Ala Ala Glu Ala Val Val Asp Pro Arg Phe
2945 2950 2955

Trp Glu Leu Val Asp Asn Glu Arg Glu Ala His Leu Arg Gly Glu
2960 2965 2970

Cys Leu Thr Cys Val Tyr Asn Met Met Gly Lys Arg Glu Lys Lys
2975 2980 2985

Leu Gly Glu Phe Gly Lys Ala Lys Gly Ser Arg Ala Ile Trp Tyr
2990 2995 3000

Met Trp Leu Gly Ala Arg Phe Leu Glu Phe Glu Ala Leu Gly Phe
3005 3010 3015

Leu Asn Glu Asp His Trp Leu Ser Arg Glu Asn Ser Gly Gly Gly
3020 3025 3030

Val Glu Gly Leu Gly Leu Gln Lys Leu Gly Tyr Ile Leu Glu Glu
3035 3040 3045

Ile Ser Arg Arg Pro Gly Gly Lys Met Tyr Ala Asp Asp Thr Ala
3050 3055 3060

Gly Trp Asp Thr Arg Ile Thr Lys Cys Asp Leu Glu Asn Glu Ala
3065 3070 3075

Arg Ile Leu Glu Lys Met Asp Gly Ile His Lys Lys Leu Ala Arg
3080 3085 3090

Ala Val Ile Glu Leu Thr Tyr Lys His Lys Val Val Arg Val Leu
3095 3100 3105

Arg Pro Ala Pro Gln Gly Lys Val Val Met Asp Ile Ile Ser Arg
3110 3115 3120

Pro Asp Gln Arg Gly Ser Gly Gln Val Val Thr Tyr Ala Leu Asn
3125 3130 3135

Thr Tyr Thr Asn Leu Val Val Gln Leu Ile Arg Asn Met Glu Ala
3140 3145 3150

Glu Ala Val Ile Asn Glu Arg Asp Met Glu Glu Leu Gln Asn Pro
3155 3160 3165

Trp Lys Val Ile Asn Trp Leu Glu Gly Asn Gly Trp Asp Arg Leu
3170 3175 3180

Arg Ser Met Ala Val Ser Gly Asp Asp Cys Val Val Lys Pro Met
3185 3190 3195

Asp Asp Arg Phe Ala Tyr Ala Leu Asn Phe Leu Asn Asp Met Gly
3200 3205 3210

Lys Val Arg Lys Asp Val Gln Glu Trp Lys Pro Ser Pro Gly Trp
3215 3220 3225

Thr Asn Trp Glu Glu Val Pro Phe Cys Ser His His Phe Asn Lys
3230 3235 3240

Leu Pro Met Lys Asp Gly Arg Thr Ile Ile Val Pro Cys Arg His
3245 3250 3255

Gln Asp Glu Leu Ile Gly Arg Ala Arg Val Ser Pro Gly Lys Gly
3260 3265 3270

Trp Ser Leu Ser Glu Thr Ala Cys Leu Gly Lys Ser Tyr Ala Gln
3275 3280 3285

Met Trp Leu Leu Leu Tyr Phe His Arg Arg Asp Leu Arg Leu Met
3290 3295 3300

Ala Asn Ala Ile Cys Ser Ala Val Pro Val Ser Trp Val Pro Thr
3305 3310 3315

Gly Arg Thr Thr Trp Ser Ile His Gly Arg Gly Glu Trp Met Thr
3320 3325 3330

Thr Glu Asp Met Leu Glu Val Trp Asn Arg Val Trp Ile Ile Glu
3335 3340 3345

Asn Glu Tyr Met Glu Asp Lys Thr Pro Val Thr Glu Trp Thr Asp
3350 3355 3360

Val Pro Tyr Leu Gly Lys Arg Glu Asp Leu Trp Cys Gly Ser Leu
3365 3370 3375

Ile Gly His Arg Pro Arg Ser Thr Trp Ala Glu Asn Ile Trp Ala
3380 3385 3390

Ala Ile Tyr Gln Val Arg Arg Ala Ile Gly Glu Thr Glu Glu Tyr
3395 3400 3405

Arg Asp Tyr Met Ser Thr Gln Val Arg Tyr Gly Ser Glu Glu Gly
3410 3415 3420

Pro Ser Ala Gly Val Leu
3425

<210> 109
<211> 403
<212> PRT
<213> sE of SEQ ID NO:88

<400> 109

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr

35

40

45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
 50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
 65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
 85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
 100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
 115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
 130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Gly Thr Gly His Glu Thr
 145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
 165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
 180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
 195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 110
<211> 403
<212> PRT
<213> sE of SEQ ID NO:89

<400> 110

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 111
<211> 403
<212> PRT
<213> sE of SEQ ID NO:90

<400> 111

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu

225		230		235		240									
Ala	Leu	Val	Glu	Phe	Lys	Asp	Ala	His	Ala	Lys	Arg	Gln	Thr	Val	Val
			245						250					255	
Val	Leu	Gly	Ser	Gln	Glu	Gly	Ala	Val	His	Thr	Ala	Leu	Ala	Gly	Ala
			260					265					270		
Leu	Glu	Ala	Glu	Met	Asp	Gly	Ala	Lys	Gly	Arg	Leu	Ser	Ser	Gly	His
		275					280					285			
Leu	Lys	Cys	Arg	Leu	Lys	Met	Asp	Lys	Leu	Arg	Leu	Lys	Gly	Val	Ser
	290					295					300				
Tyr	Ser	Leu	Cys	Thr	Ala	Ala	Phe	Thr	Phe	Thr	Lys	Ile	Pro	Ala	Glu
305					310					315					320
Thr	Leu	His	Gly	Thr	Val	Thr	Val	Glu	Val	Gln	Tyr	Ala	Gly	Thr	Asp
			325						330					335	
Gly	Pro	Cys	Lys	Val	Pro	Ala	Gln	Met	Ala	Val	Asp	Met	Gln	Thr	Leu
			340					345					350		
Thr	Pro	Val	Gly	Arg	Leu	Ile	Thr	Ala	Asn	Pro	Val	Ile	Thr	Glu	Ser
		355					360					365			
Thr	Glu	Asn	Ser	Lys	Met	Met	Leu	Glu	Leu	Asp	Pro	Pro	Phe	Gly	Asp
	370					375					380				
Ser	Tyr	Ile	Val	Ile	Gly	Val	Gly	Glu	Lys	Lys	Ile	Thr	His	His	Trp
385					390					395					400
His Arg Ser															

<210> 112
 <211> 403
 <212> PRT
 <213> sE of SEQ ID NO:91
 <400> 112

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly Tyr Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Lys Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Ile Pro Val Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 113

<211> 403

<212> PRT

<213> sE of SEQ ID NO:92

<400> 113

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Ile Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<211> 403
<212> PRT
<213> sE of SEQ ID NO:93

<400> 114

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Ile Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 115
<211> 403
<212> PRT
<213> sE of SEQ ID NO:94

<400> 115

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro

180

185

190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
 195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
 260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser

<210> 116

<211> 403

<212> PRT

<213> sE of SEQ ID NO:95

<400> 116

Ile Ser Cys Ile Gly Val Ser Asn Arg Asp Leu Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Glu Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Met
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Leu Ser Asp Met Ala Ser Ala Ser Arg Cys Pro Thr Gln Gly Glu Pro
65 70 75 80

Ser Leu Asp Lys Gln Ser Asp Thr Gln Ser Val Cys Lys Arg Thr Leu
85 90 95

Gly Asp Arg Gly Trp Gly Asn Gly Cys Gly Ile Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ser Lys Phe Thr Cys Cys Lys Lys Met Pro Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Pro Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Ser Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 117
<211> 403
<212> PRT
<213> sE of SEQ ID NO:96

<220>
<221> misc_feature
<222> (152)..(156)
<223> Xaa can be any naturally occurring amino acid

<400> 117

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His

130

135

140

Gly Ser Gln His Ser Gly Met Xaa Xaa Xaa Xaa Xaa Gly His Glu Thr
 145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
 165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
 180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
 195 200 205

Lys His Arg Leu Val Arg Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
 260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

Leu Lys Lys

<210> 118
<211> 403
<212> PRT
<213> sE of SEQ ID NO:97

<400> 118

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Val Cys Thr Ala Ala Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 119
<211> 403
<212> PRT
<213> sE of SEQ ID NO:98

<220>
<221> misc_feature
<222> (156)..(162)
<223> Xaa can be any naturally occurring amino acid

<400> 119

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu

85

90

95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
 100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
 115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
 130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Xaa Xaa Xaa Xaa Xaa
 145 150 155 160

Xaa Xaa Asn Arg Ala Glu Val Glu Val Thr Pro Asn Ser Pro Arg Ala
 165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
 180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
 195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
 260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 120
<211> 403
<212> PRT
<213> sE of SEQ ID NO:99

<400> 120

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Ala Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 121
<211> 403
<212> PRT
<213> sE of SEQ ID NO:100

<400> 121

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His

275

280

285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser

<210> 122

<211> 403

<212> PRT

<213> sE of SEQ ID NO:101

<400> 122

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
 1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
 20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
 35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Thr Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Gly
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 123
<211> 403
<212> PRT
<213> sE of SEQ ID NO:102

<400> 123

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr

35

40

45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
 50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
 65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
 85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
 100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
 115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
 130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His Glu Thr
 145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
 165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
 180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
 195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
 245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 124
<211> 397
<212> PRT
<213> sE of SEQ ID NO:103

<400> 124

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Glu Asn Arg Ala Lys
145 150 155 160

Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu Gly Gly
165 170 175

Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu Asp Phe
180 185 190

Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu Val His
195 200 205

Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly Ala Asp
210 215 220

Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu Phe Lys
225 230 235 240

Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser Gln Glu
245 250 255

Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu Met Asp
260 265 270

Gly Ala Lys Gly Arg Leu Phe Ser Gly His Leu Lys Cys Arg Leu Lys
275 280 285

Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys Thr Ala
290 295 300

Ala Phe Thr Phe Thr Lys Val Pro Ala Glu Thr Leu His Gly Thr Val
305 310 315 320

Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys Val Pro
325 330 335

Ala Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly Arg Leu
340 345 350

Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser Lys Met
355 360 365

Met Leu Glu Leu Asp Pro Pro Phe Gly Asp Ser Tyr Ile Val Ile Gly
370 375 380

Val Gly Asp Lys Lys Ile Thr His His Trp His Arg Ser
385 390 395

<210> 125
<211> 403
<212> PRT
<213> sE of SEQ ID NO:104

<400> 125

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val

245

250

255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
 260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser

<210> 126

<211> 397

<212> PRT

<213> sE of SEQ ID NO:105

<400> 126

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
 1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Glu Asn Arg Ala Lys
145 150 155 160

Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu Gly Gly
165 170 175

Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu Asp Phe
180 185 190

Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu Val His
195 200 205

Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly Ala Asp
210 215 220

Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu Phe Lys
225 230 235 240

Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser Gln Glu
245 250 255

Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu Met Asp
260 265 270

Gly Ala Lys Gly Arg Leu Phe Ser Gly His Leu Lys Cys Arg Leu Lys
275 280 285

Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys Thr Ala
290 295 300

Ala Phe Thr Phe Thr Lys Val Pro Ala Glu Thr Leu His Gly Thr Val
305 310 315 320

Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys Val Pro
325 330 335

Ala Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly Arg Leu
340 345 350

Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser Lys Met
355 360 365

Met Leu Glu Leu Asp Pro Pro Phe Gly Asp Ser Tyr Ile Val Ile Gly
370 375 380

Val Gly Asp Lys Lys Ile Thr His His Trp His Arg Ser
385 390 395

<210> 127
<211> 403
<212> PRT
<213> sE of SEQ ID NO:106

<400> 127

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr

20

25

30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
 35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
 50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
 65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
 85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
 100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
 115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
 130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
 145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
 165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
 180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
 195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
 210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
 225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Thr Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser

<210> 128
<211> 404
<212> PRT
<213> sE of SEQ ID NO:107

<400> 128

Ile Arg Cys Ile Gly Ile Gly Asn Arg Asp Phe Ile Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Ile Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ser Asn Asp Lys Pro Thr Leu Asp Phe Glu Leu Val Thr Thr
35 40 45

Thr Ala Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Asn
50 55 60

Ile Ser Glu Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Met Ala Asp Ser Gln Phe Val Cys Lys Arg Gly Tyr
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Ile Val Thr Cys Ala Lys Phe Thr Cys Val Lys Lys Leu Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Val Leu Val Ser Val His
130 135 140

Ala Ser Gln His Gly Gly Met Ile Asn Asn Asp Thr Asn His Gln His
145 150 155 160

Asp Lys Glu Asn Arg Ala Arg Ile Asp Ile Thr Ala Ser Ala Pro Arg
165 170 175

Val Glu Val Glu Leu Gly Ser Phe Gly Ser Phe Ser Met Glu Cys Glu
180 185 190

Pro Arg Ser Gly Leu Asn Phe Gly Asp Leu Tyr Tyr Leu Thr Met Asn
195 200 205

Asn Lys His Trp Leu Val Asn Arg Asp Trp Phe His Asp Leu Ser Leu
210 215 220

Pro Trp His Thr Gly Ala Thr Ser Asn Asn His His Trp Asn Asn Lys
225 230 235 240

Glu Ala Leu Val Glu Phe Arg Glu Ala His Ala Lys Lys Gln Thr Ala
245 250 255

Val Val Leu Gly Ser Gln Glu Gly Ala Val His Ala Ala Leu Ala Gly
260 265 270

Ala Leu Glu Ala Glu Ser Asp Gly His Lys Ala Thr Ile Tyr Ser Gly
275 280 285

His Leu Lys Cys Arg Leu Lys Leu Asp Lys Leu Arg Leu Lys Gly Met
290 295 300

Ser Tyr Ala Leu Cys Thr Gly Ala Phe Thr Phe Ala Arg Thr Pro Ser
305 310 315 320

Glu Thr Ile His Gly Thr Ala Thr Val Glu Leu Gln Tyr Ala Gly Glu
325 330 335

Asp Gly Pro Cys Lys Val Pro Ile Val Ile Thr Ser Asp Thr Asn Ser
340 345 350

Met Ala Ser Thr Gly Arg Leu Ile Thr Ala Asn Pro Val Val Thr Glu
355 360 365

Ser Gly Ala Asn Ser Lys Met Met Val Glu Ile Asp Pro Pro Phe Gly
370 375 380

Asp Ser Tyr Ile Ile Val Gly Thr Gly Thr Thr Lys Ile Thr His His
385 390 395 400

Trp His Arg Ala

<210> 129

<211> 404

<212> PRT

<213> sE of SEQ ID NO:108

<400> 129

Ile Arg Cys Ile Gly Ile Gly Asn Arg Asp Phe Ile Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Ile Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ser Asn Asp Lys Pro Thr Leu Asp Phe Glu Leu Val Thr Thr
35 40 45

Thr Ala Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Asn
50 55 60

Ile Ser Glu Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Met Ala Asp Ser Gln Phe Val Cys Lys Arg Gly Tyr
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Ile Val Thr Cys Ala Lys Phe Thr Cys Val Lys Lys Leu Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Val Leu Val Ser Val His
130 135 140

Ala Ser Gln His Gly Gly Met Ile Asn Asn Asp Thr Asn His Gln His
145 150 155 160

Asp Lys Glu Asn Arg Ala Arg Ile Asp Ile Thr Ala Ser Ala Pro Arg
165 170 175

Val Glu Val Glu Leu Gly Ser Phe Gly Ser Phe Ser Met Glu Cys Glu
180 185 190

Pro Arg Ser Gly Leu Asn Phe Gly Asp Leu Tyr Tyr Leu Thr Met Asn
195 200 205

Asn Lys His Trp Leu Val Asn Arg Asp Trp Phe His Asp Leu Ser Leu

210

215

220

Pro Trp His Thr Gly Ala Thr Ser Asn Asn His His Trp Asn Asn Lys
 225 230 235 240

Glu Ala Leu Val Glu Phe Arg Glu Ala His Ala Lys Lys Gln Thr Ala
 245 250 255

Val Val Leu Gly Ser Gln Glu Gly Ala Val His Ala Ala Leu Ala Gly
 260 265 270

Ala Leu Glu Ala Glu Ser Asp Gly His Lys Ala Thr Ile Tyr Ser Gly
 275 280 285

His Leu Lys Cys Arg Leu Lys Leu Asp Lys Leu Arg Leu Lys Gly Met
 290 295 300

Ser Tyr Ala Leu Cys Thr Gly Ala Phe Thr Phe Ala Arg Thr Pro Ser
 305 310 315 320

Glu Thr Ile His Gly Thr Ala Thr Val Glu Leu Gln Tyr Ala Gly Glu
 325 330 335

Asp Gly Pro Cys Lys Val Pro Ile Val Ile Thr Ser Asp Thr Asn Ser
 340 345 350

Met Ala Ser Thr Gly Arg Leu Ile Thr Ala Asn Pro Val Val Thr Glu
 355 360 365

Ser Gly Ala Asn Ser Lys Met Met Val Glu Ile Asp Pro Pro Phe Gly
 370 375 380

Asp Ser Tyr Ile Ile Val Gly Thr Gly Thr Thr Lys Ile Thr His His
 385 390 395 400

Trp His Arg Ala

<210> 130

<211> 504

<212> PRT

<213> E-protein of SEQ ID NO:88 + stem anchor

<400> 130

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Gly Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 131
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:89 + stem anchor

<400> 131

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu

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

<210> 132
 <211> 504
 <212> PRT

<213> E-protein of SEQ ID NO:90 + stem anchor

<400> 132

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 133
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:91 + stem anchor

<400> 133

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly Tyr Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Lys Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu

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

<210> 134
 <211> 504
 <212> PRT

<213> E-protein of SEQ ID NO:92 + stem anchor

<400> 134

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Ile Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 135
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:93 + stem anchor

<400> 135

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Ile Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu

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

<210> 136
 <211> 504
 <212> PRT

<213> E-protein of SEQ ID NO:94 + stem anchor

<400> 136

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 137
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:95 + stem anchor

<400> 137

Ile Ser Cys Ile Gly Val Ser Asn Arg Asp Leu Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Glu Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Met
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Leu Ser Asp Met Ala Ser Ala Ser Arg Cys Pro Thr Gln Gly Glu Pro
65 70 75 80

Ser Leu Asp Lys Gln Ser Asp Thr Gln Ser Val Cys Lys Arg Thr Leu
85 90 95

Gly Asp Arg Gly Trp Gly Asn Gly Cys Gly Ile Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ser Lys Phe Thr Cys Cys Lys Lys Met Pro Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Pro Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu

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

<210> 138
 <211> 504
 <212> PRT

<213> E-protein of SEQ ID NO:96 + stem anchor

<220>

<221> misc_feature

<222> (152)..(156)

<223> Xaa can be any naturally occurring amino acid

<400> 138

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Xaa Xaa Xaa Xaa Xaa Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Arg Leu Val Arg Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

Leu Lys Lys Gly Ser Ser Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Val His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 139
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:97 + stem anchor

<400> 139

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala

65

70

75

80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Val Cys Thr Ala Ala Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala

500

<210> 140
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:98 + stem anchor

<220>
<221> misc_feature
<222> (156)..(162)
<223> Xaa can be any naturally occurring amino acid

<400> 140

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Xaa Xaa Xaa Xaa Xaa
145 150 155 160

Xaa Xaa Asn Arg Ala Glu Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 141
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:99 + stem anchor

<400> 141

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Ala Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala

260

265

270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
 405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
 420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
 435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
 450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys
 465 470 475 480

Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 142
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:100 + stem anchor

<400> 142

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 143
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:101 + stem anchor

<400> 143

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Thr Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala

260

265

270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
 275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
 290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
 305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
 325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
 340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Gly
 355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
 370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
 385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
 405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
 420 425 430

Ser Val Gly Gly Val Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
 435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
 450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
 465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 144
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:102 + stem anchor

<400> 144

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Val His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 145
<211> 498
<212> PRT
<213> E-protein of SEQ ID NO:103 + stem anchor

<400> 145

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Glu Asn Arg Ala Lys
145 150 155 160

Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu Gly Gly
165 170 175

Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu Asp Phe
180 185 190

Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu Val His
195 200 205

Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly Ala Asp
210 215 220

Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu Phe Lys
225 230 235 240

Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser Gln Glu
245 250 255

Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu Met Asp

260

265

270

Gly Ala Lys Gly Arg Leu Phe Ser Gly His Leu Lys Cys Arg Leu Lys
 275 280 285

Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys Thr Ala
 290 295 300

Ala Phe Thr Phe Thr Lys Val Pro Ala Glu Thr Leu His Gly Thr Val
 305 310 315 320

Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys Val Pro
 325 330 335

Ala Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly Arg Leu
 340 345 350

Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser Lys Met
 355 360 365

Met Leu Glu Leu Asp Pro Pro Phe Gly Asp Ser Tyr Ile Val Ile Gly
 370 375 380

Val Gly Asp Lys Lys Ile Thr His His Trp His Arg Ser Gly Ser Thr
 385 390 395 400

Ile Gly Lys Ala Phe Glu Ala Thr Val Arg Gly Ala Lys Arg Met Ala
 405 410 415

Val Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly Val Phe
 420 425 430

Asn Ser Leu Gly Lys Gly Ile His Gln Ile Phe Gly Ala Ala Phe Lys
 435 440 445

Ser Leu Phe Gly Gly Met Ser Trp Phe Ser Gln Ile Leu Ile Gly Thr
 450 455 460

Leu Leu Val Trp Leu Gly Leu Asn Thr Lys Asn Gly Ser Ile Ser Leu
 465 470 475 480

Thr Cys Leu Ala Leu Gly Gly Val Met Ile Phe Leu Ser Thr Ala Val
485 490 495

Ser Ala

<210> 146
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:104 + stem anchor

<400> 146

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Ile Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Val Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Phe Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Val Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Asp Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Val Phe Asn Ser Leu Gly Lys Gly Val His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Val Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Thr Cys Leu Ala Leu Gly Gly Val Met Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 147
<211> 498
<212> PRT
<213> E-protein of SEQ ID NO:105 + stem anchor

<400> 147

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Thr Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Glu Asn Arg Ala Lys
145 150 155 160

Val Glu Val Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu Gly Gly
165 170 175

Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu Asp Phe
180 185 190

Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu Val His
195 200 205

Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly Ala Asp
210 215 220

Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu Phe Lys
225 230 235 240

Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser Gln Glu
245 250 255

Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu Met Asp

260

265

270

Gly Ala Lys Gly Arg Leu Phe Ser Gly His Leu Lys Cys Arg Leu Lys
 275 280 285

Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys Thr Ala
 290 295 300

Ala Phe Thr Phe Thr Lys Val Pro Ala Glu Thr Leu His Gly Thr Val
 305 310 315 320

Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys Val Pro
 325 330 335

Ala Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly Arg Leu
 340 345 350

Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser Lys Met
 355 360 365

Met Leu Glu Leu Asp Pro Pro Phe Gly Asp Ser Tyr Ile Val Ile Gly
 370 375 380

Val Gly Asp Lys Lys Ile Thr His His Trp His Arg Ser Gly Ser Thr
 385 390 395 400

Ile Gly Lys Ala Phe Glu Ala Thr Val Arg Gly Ala Lys Arg Met Ala
 405 410 415

Val Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly Val Phe
 420 425 430

Asn Ser Leu Gly Lys Gly Ile His Gln Ile Phe Gly Ala Ala Phe Lys
 435 440 445

Ser Leu Phe Gly Gly Met Ser Trp Phe Ser Gln Ile Leu Ile Gly Thr
 450 455 460

Leu Leu Val Trp Leu Gly Leu Asn Thr Lys Asn Gly Ser Ile Ser Leu
 465 470 475 480

Thr Cys Leu Ala Leu Gly Gly Val Met Ile Phe Leu Ser Thr Ala Val
485 490 495

Ser Ala

<210> 148
<211> 504
<212> PRT
<213> E-protein of SEQ ID NO:106 + stem anchor

<400> 148

Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Val Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val Thr Thr
35 40 45

Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser
50 55 60

Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser Val His
130 135 140

Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His Glu Thr
145 150 155 160

Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro Arg Ala
165 170 175

Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro
180 185 190

Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn
195 200 205

Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro Leu Pro
210 215 220

Trp His Ala Gly Ala Asp Thr Gly Thr Pro His Trp Asn Asn Lys Glu
225 230 235 240

Ala Leu Val Glu Phe Lys Asp Ala His Ala Lys Arg Gln Thr Val Val
245 250 255

Val Leu Gly Thr Gln Glu Gly Ala Val His Thr Ala Leu Ala Gly Ala
260 265 270

Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser Gly His
275 280 285

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly Val Ser
290 295 300

Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu
305 310 315 320

Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly Thr Asp
325 330 335

Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln Thr Leu
340 345 350

Thr Pro Val Gly Arg Leu Ile Thr Ala Asn Pro Val Ile Thr Glu Ser
355 360 365

Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe Gly Asp
370 375 380

Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His His Trp
385 390 395 400

His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr Val Arg
405 410 415

Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly
420 425 430

Ser Val Gly Gly Ala Leu Asn Ser Leu Gly Lys Gly Ile His Gln Ile
435 440 445

Phe Gly Ala Ala Phe Lys Ser Leu Phe Gly Gly Met Ser Trp Phe Ser
450 455 460

Gln Ile Leu Ile Gly Thr Leu Leu Met Trp Leu Gly Leu Asn Thr Lys
465 470 475 480

Asn Gly Ser Ile Ser Leu Met Cys Leu Ala Leu Gly Gly Val Leu Ile
485 490 495

Phe Leu Ser Thr Ala Val Ser Ala
500

<210> 149
<211> 505
<212> PRT
<213> E-protein of SEQ ID NO:107 + stem anchor

<400> 149

Ile Arg Cys Ile Gly Ile Gly Asn Arg Asp Phe Ile Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Ile Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ser Asn Asp Lys Pro Thr Leu Asp Phe Glu Leu Val Thr Thr
35 40 45

Thr Ala Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Asn
50 55 60

Ile Ser Glu Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Met Ala Asp Ser Gln Phe Val Cys Lys Arg Gly Tyr
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Ile Val Thr Cys Ala Lys Phe Thr Cys Val Lys Lys Leu Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Val Leu Val Ser Val His
130 135 140

Ala Ser Gln His Gly Gly Met Ile Asn Asn Asp Thr Asn His Gln His
145 150 155 160

Asp Lys Glu Asn Arg Ala Arg Ile Asp Ile Thr Ala Ser Ala Pro Arg
165 170 175

Val Glu Val Glu Leu Gly Ser Phe Gly Ser Phe Ser Met Glu Cys Glu
180 185 190

Pro Arg Ser Gly Leu Asn Phe Gly Asp Leu Tyr Tyr Leu Thr Met Asn
195 200 205

Asn Lys His Trp Leu Val Asn Arg Asp Trp Phe His Asp Leu Ser Leu
210 215 220

Pro Trp His Thr Gly Ala Thr Ser Asn Asn His His Trp Asn Asn Lys
225 230 235 240

Glu Ala Leu Val Glu Phe Arg Glu Ala His Ala Lys Lys Gln Thr Ala
245 250 255

Val Val Leu Gly Ser Gln Glu Gly Ala Val His Ala Ala Leu Ala Gly

260

265

270

Ala Leu Glu Ala Glu Ser Asp Gly His Lys Ala Thr Ile Tyr Ser Gly
 275 280 285

His Leu Lys Cys Arg Leu Lys Leu Asp Lys Leu Arg Leu Lys Gly Met
 290 295 300

Ser Tyr Ala Leu Cys Thr Gly Ala Phe Thr Phe Ala Arg Thr Pro Ser
 305 310 315 320

Glu Thr Ile His Gly Thr Ala Thr Val Glu Leu Gln Tyr Ala Gly Glu
 325 330 335

Asp Gly Pro Cys Lys Val Pro Ile Val Ile Thr Ser Asp Thr Asn Ser
 340 345 350

Met Ala Ser Thr Gly Arg Leu Ile Thr Ala Asn Pro Val Val Thr Glu
 355 360 365

Ser Gly Ala Asn Ser Lys Met Met Val Glu Ile Asp Pro Pro Phe Gly
 370 375 380

Asp Ser Tyr Ile Ile Val Gly Thr Gly Thr Thr Lys Ile Thr His His
 385 390 395 400

Trp His Arg Ala Gly Ser Ser Ile Gly Arg Ala Phe Glu Ala Thr Met
 405 410 415

Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe
 420 425 430

Gly Ser Val Gly Gly Met Phe Asn Ser Val Gly Lys Phe Val His Gln
 435 440 445

Val Phe Gly Ser Ala Phe Lys Ala Leu Phe Gly Gly Met Ser Trp Phe
 450 455 460

Thr Gln Leu Leu Ile Gly Phe Leu Leu Ile Trp Met Gly Leu Asn Ala
 465 470 475 480

Arg Gly Gly Thr Val Ala Met Ser Phe Met Gly Ile Gly Ala Met Leu
485 490 495

Ile Phe Leu Ala Thr Ser Val Ser Gly
500 505

<210> 150
<211> 505
<212> PRT
<213> E-protein of SEQ ID NO:108 + stem anchor

<400> 150

Ile Arg Cys Ile Gly Ile Gly Asn Arg Asp Phe Ile Glu Gly Met Ser
1 5 10 15

Gly Gly Thr Trp Val Asp Ile Val Leu Glu His Gly Gly Cys Val Thr
20 25 30

Val Met Ser Asn Asp Lys Pro Thr Leu Asp Phe Glu Leu Val Thr Thr
35 40 45

Thr Ala Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu Ala Asn
50 55 60

Ile Ser Glu Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
65 70 75 80

Tyr Leu Asp Lys Met Ala Asp Ser Gln Phe Val Cys Lys Arg Gly Tyr
85 90 95

Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100 105 110

Ile Val Thr Cys Ala Lys Phe Thr Cys Val Lys Lys Leu Thr Gly Lys
115 120 125

Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Val Leu Val Ser Val His
130 135 140

Ala Ser Gln His Gly Gly Met Ile Asn Asn Asp Thr Asn His Gln His
145 150 155 160

Asp Lys Glu Asn Arg Ala Arg Ile Asp Ile Thr Ala Ser Ala Pro Arg
165 170 175

Val Glu Val Glu Leu Gly Ser Phe Gly Ser Phe Ser Met Glu Cys Glu
180 185 190

Pro Arg Ser Gly Leu Asn Phe Gly Asp Leu Tyr Tyr Leu Thr Met Asn
195 200 205

Asn Lys His Trp Leu Val Asn Arg Asp Trp Phe His Asp Leu Ser Leu
210 215 220

Pro Trp His Thr Gly Ala Thr Ser Asn Asn His His Trp Asn Asn Lys
225 230 235 240

Glu Ala Leu Val Glu Phe Arg Glu Ala His Ala Lys Lys Gln Thr Ala
245 250 255

Val Val Leu Gly Ser Gln Glu Gly Ala Val His Ala Ala Leu Ala Gly
260 265 270

Ala Leu Glu Ala Glu Ser Asp Gly His Lys Ala Thr Ile Tyr Ser Gly
275 280 285

His Leu Lys Cys Arg Leu Lys Leu Asp Lys Leu Arg Leu Lys Gly Met
290 295 300

Ser Tyr Ala Leu Cys Thr Gly Ala Phe Thr Phe Ala Arg Thr Pro Ser
305 310 315 320

Glu Thr Ile His Gly Thr Ala Thr Val Glu Leu Gln Tyr Ala Gly Glu
325 330 335

Asp Gly Pro Cys Lys Val Pro Ile Val Ile Thr Ser Asp Thr Asn Ser
340 345 350

Met Ala Ser Thr Gly Arg Leu Ile Thr Ala Asn Pro Val Val Thr Glu
355 360 365

Ser Gly Ala Asn Ser Lys Met Met Val Glu Ile Asp Pro Pro Phe Gly
370 375 380

Asp Ser Tyr Ile Ile Val Gly Thr Gly Thr Thr Lys Ile Thr His His
385 390 395 400

Trp His Arg Ala Gly Ser Ser Ile Gly Arg Ala Phe Glu Ala Thr Met
405 410 415

Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp Phe
420 425 430

Gly Ser Val Gly Gly Met Phe Asn Ser Val Gly Lys Phe Val His Gln
435 440 445

Val Phe Gly Ser Ala Phe Lys Ala Leu Phe Gly Gly Met Ser Trp Phe
450 455 460

Thr Gln Leu Leu Ile Gly Phe Leu Leu Ile Trp Met Gly Leu Asn Ala
465 470 475 480

Arg Gly Gly Thr Val Ala Met Ser Phe Met Gly Ile Gly Ala Met Leu
485 490 495

Ile Phe Leu Ala Thr Ser Val Ser Gly
500 505

<210> 151
<211> 589
<212> PRT
<213> Artificial sequence

<220>
<223> SEQ ID NO 61 without N-terminal RR

<400> 151

Gly Ala Asp Thr Ser Val Gly Ile Val Gly Leu Leu Leu Thr Thr Ala
1 5 10 15

Met Ala Ala Glu Val Thr Arg Arg Gly Ser Ala Tyr Tyr Met Tyr Leu
20 25 30

Asp Arg Asn Asp Ala Gly Glu Ala Ile Ser Phe Pro Thr Thr Leu Gly
35 40 45

Met Asn Lys Cys Tyr Ile Gln Ile Met Asp Leu Gly His Met Cys Asp
50 55 60

Ala Thr Met Ser Tyr Glu Cys Pro Met Leu Asp Glu Gly Val Glu Pro
65 70 75 80

Asp Asp Val Asp Cys Trp Cys Asn Thr Thr Ser Thr Trp Val Val Tyr
85 90 95

Gly Thr Cys His His Lys Lys Gly Glu Ala Arg Arg Ser Arg Arg Ala
100 105 110

Val Thr Leu Pro Ser His Ser Thr Arg Lys Leu Gln Thr Arg Ser Gln
115 120 125

Thr Trp Leu Glu Ser Arg Glu Tyr Thr Lys His Leu Ile Arg Val Glu
130 135 140

Asn Trp Ile Phe Arg Asn Pro Gly Phe Ala Leu Ala Ala Ala Ala Ile
145 150 155 160

Ala Trp Leu Leu Gly Ser Ser Thr Ser Gln Lys Val Ile Tyr Leu Val
165 170 175

Met Ile Leu Leu Ile Ala Pro Ala Tyr Ser Ile Arg Cys Ile Gly Val
180 185 190

Ser Asn Arg Asp Phe Val Glu Gly Met Ser Gly Gly Thr Trp Val Asp
195 200 205

Val Val Leu Glu His Gly Gly Cys Val Thr Val Met Ala Gln Asp Lys
210 215 220

Pro Thr Val Asp Ile Glu Leu Val Thr Thr Thr Val Ser Asn Met Ala
225 230 235 240

Glu Val Arg Ser Tyr Cys Tyr Glu Ala Ser Ile Ser Asp Met Ala Ser
245 250 255

Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala Tyr Leu Asp Lys Gln Ser
260 265 270

Asp Thr Gln Tyr Val Cys Lys Arg Thr Leu Val Asp Arg Gly Trp Gly
275 280 285

Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser Leu Val Thr Cys Ala Lys
290 295 300

Phe Ala Cys Ser Lys Lys Met Thr Gly Lys Ser Ile Gln Pro Glu Asn
305 310 315 320

Leu Glu Tyr Arg Ile Met Leu Ser Val His Gly Ser Gln His Ser Gly
325 330 335

Met Ile Val Asn Asp Thr Gly His Glu Thr Asp Glu Asn Arg Ala Lys
340 345 350

Val Glu Ile Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu Gly Gly
355 360 365

Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu Asp Phe
370 375 380

Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu Val His
385 390 395 400

Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly Ala Asp
405 410 415

Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu Phe Lys
420 425 430

Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser Gln Glu
435 440 445

Gly Ala Val His Thr Ala Leu Ala Gly Ala Leu Glu Ala Glu Met Asp
450 455 460

Gly Ala Lys Gly Arg Leu Ser Ser Gly His Leu Lys Cys Arg Leu Lys
465 470 475 480

Met Asp Lys Leu Arg Leu Lys Gly Val Ser Tyr Ser Leu Cys Thr Ala
485 490 495

Ala Phe Thr Phe Thr Lys Ile Pro Ala Glu Thr Leu His Gly Thr Val
500 505 510

Thr Val Glu Val Gln Tyr Ala Gly Thr Asp Gly Pro Cys Lys Val Pro
515 520 525

Ala Gln Met Ala Val Asp Met Gln Thr Leu Thr Pro Val Gly Arg Leu
530 535 540

Ile Thr Ala Asn Pro Val Ile Thr Glu Ser Thr Glu Asn Ser Lys Met
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Met Asn Lys Cys Tyr Ile Gln Ile Met Asp Leu Gly His Met Cys Asp
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Ala Thr Met Ser Tyr Glu Cys Pro Met Leu Asp Glu Gly Val Glu Pro
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Asp Asp Val Asp Cys Trp Cys Asn Thr Thr Ser Thr Trp Val Val Tyr
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Gly Thr Cys His His Lys Lys Gly Glu Ala Arg Arg Ser Arg Arg Ala
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Val Thr Leu Pro Ser His Ser Thr Arg Lys Leu Gln Thr Arg Ser Gln
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Thr Trp Leu Glu Ser Arg Glu Tyr Thr Lys His Leu Ile Arg Val Glu
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Asn Trp Ile Phe Arg Asn Pro Gly Phe Ala Leu Ala Ala Ala Ala Ile
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Ala Trp Leu Leu Gly Ser Ser Thr Ser Gln Lys Val Ile Tyr Leu Val
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Met Ile Leu Leu Ile Ala Pro Ala Tyr Ser Ile Arg Cys Ile Gly Val
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Ser Asn Arg Asp Phe Val Glu Gly Met Ser Gly Gly Thr Trp Val Asp
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Val Val Leu Glu His Gly Gly Cys Val Thr Val Met Ala Gln Asp Lys
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Pro Thr Val Asp Ile Glu Leu Val Thr Thr Thr Val Ser Asn Met Ala
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Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala Tyr Leu Asp Lys Gln Ser
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Leu Glu Tyr Arg Ile Met Leu Ser Val His Gly Ser Gln His Ser Gly
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Met Ile Val Asn Asp Thr Gly His Glu Thr Asp Glu Asn Arg Ala Lys
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Val Glu Ile Thr Pro Asn Ser Pro Arg Ala Glu Ala Thr Leu Gly Gly
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Phe Gly Ser Leu Gly Leu Asp Cys Glu Pro Arg Thr Gly Leu Asp Phe
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Ser Asp Leu Tyr Tyr Leu Thr Met Asn Asn Lys His Trp Leu Val His
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Lys Glu Trp Phe His Asp Ile Pro Leu Pro Trp His Ala Gly Ala Asp
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Thr Gly Thr Pro His Trp Asn Asn Lys Glu Ala Leu Val Glu Phe Lys
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Asp Ala His Ala Lys Arg Gln Thr Val Val Val Leu Gly Ser Gln Glu
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Val Gly Glu Lys Lys Ile Thr His His Trp His Arg Ser Gly Ser Thr
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<210> 156
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 <212> DNA
 <213> Artificial sequence

<220>

<223> Enhanced honeybee melittin signal peptide

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Ser Arg Ala

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<213> Homo sapiens serum albumin signal peptide

<400> 158
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1 5 10 15

Tyr Ser

<210> 159
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<213> Homo sapiens Leukocyte immunoglobulin-like receptor subfamily B member 1
signal peptide

<400> 159
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Pro Arg Thr His Val Gln Ala
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<213> Bos taurus prolactin signal peptide

<400> 160

Met Asp Ser Lys Gly Ser Ser Gln Lys Gly Ser Arg Leu Leu Leu Leu
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Leu Val Val Ser Asn Leu Leu Leu Cys Gln Gly Val Val Ser
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<213> Lymphocytic choriomeningitis virus (strain Armstrong), pre-glycoprotein
polyprotein GP complex signal peptide

<400> 161

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Phe Leu Leu Leu Ala Gly Arg Ser Cys Gly
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<210> 162
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<212> PRT
<213> Homo sapiens insulin receptor signal peptide

<400> 162

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Ala Val Ala Ala Leu Leu Leu Gly Ala Ala Gly
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<212> PRT
<213> Drosophila melanogaster BM-40 signal peptide

<400> 163

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His Val Gln Ala
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<210> 164
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<212> PRT
<213> Vesicular stomatitis virus Glycoprotein protein signal peptide

<400> 164

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<213> Homo sapiens Chymotrypsinogen B signal peptide

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Phe Gly

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<213> Homo sapiens Interleukin-2 signal peptide

<400> 166

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1 5 10 15

Val Thr Asn Ser
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<210> 167
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<212> PRT
<213> Gaussia princeps Luciferase signal peptide

<400> 167

Met Gly Val Lys Val Leu Phe Ala Leu Ile Cys Ile Ala Val Ala Glu
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Ala

<210> 168
<211> 19
<212> PRT
<213> Gaussia princeps Gluc Luciferase signal peptide

<400> 168

Met Gly Val Lys Val Leu Phe Ala Leu Ile Cys Ile Ala Val Ala Glu
1 5 10 15

Val Thr Gly

<210> 169
<211> 17
<212> PRT
<213> Influenza A virus (strain A/Puerto Rico/8/1934 H1N1) Hemagglutinin (HA)
signal peptide

<400> 169

Met Lys Ala Asn Leu Leu Val Leu Leu Cys Ala Leu Ala Ala Asp
1 5 10 15

Ala

<210> 170
<211> 15
<212> PRT
<213> Influenza A virus (strain A/Japan/305/1957 H2N2) Hemagglutinin (HA)
signal peptide

<400> 170

Met Ala Ile Ile Tyr Leu Ile Leu Leu Phe Thr Ala Val Arg Gly
1 5 10 15

<210> 171

<211> 16

<212> PRT

<213> Influenza A virus (strain A/Hong Kong/156/1997 H5N1 genotype Gs/Gd)
Hemagglutinin signal peptide

<400> 171

Met Glu Lys Thr Val Leu Leu Leu Ala Thr Val Ser Leu Val Lys Ser
1 5 10 15

<210> 172

<211> 21

<212> PRT

<213> Hepatitis C Virus (HCV) 1b E1 signal peptide

<400> 172

Met Gly Cys Ser Phe Ser Ile Phe Leu Leu Ala Leu Leu Ser Cys Leu
1 5 10 15

Thr Thr Pro Ala Ser
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<210> 173

<211> 20

<212> PRT

<213> Hepatitis C Virus 1b E2 signal peptide

<400> 173

Met Val Gly Asn Trp Ala Lys Val Leu Ile Val Met Leu Leu Phe Ala
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Gly Val Asp Gly
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<210> 174

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<212> PRT

<213> Artificial sequence

<220>

<223> Signal peptide based on HCV 1b

<400> 174

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<212> PRT

<213> Homo sapiens Tissue-type plasminogen activator signal peptide 1

<400> 175

Met	Asp	Ala	Met	Lys	Arg	Gly	Leu	Cys	Cys	Val	Leu	Leu	Leu	Cys	Gly
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Ala	Val	Phe	Val	Ser	Pro
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<211> 25

<212> PRT

<213> Homo sapiens Tissue-type plasminogen activator signal peptide 2

<400> 176

Met	Asp	Ala	Met	Lys	Arg	Gly	Leu	Cys	Cys	Val	Leu	Leu	Leu	Cys	Gly
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<212> PRT

<213> Murray Valley encephalitis (MVE) virus prM signal peptide

<400> 177

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 <213> Yellow fever virus signal peptide

<400> 178

Lys Arg Arg Ser His Asp Val Leu Thr Val Gln Phe Leu Ile Leu Gly
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Met Leu Leu Met Thr Gly Gly Val Thr Leu
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<210> 179
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 <212> PRT
 <213> Kunjin virus signal peptide

<400> 179

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Ala Gly Val Gly Ala Val Thr Leu
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<210> 180
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 <212> PRT
 <213> Tick-borne encephalitis virus signal peptide

<400> 180

Lys Arg Arg Ser Ala Thr Asp Trp Met Ser Trp Leu Leu Val Ile Thr
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Leu Leu Gly Met Thr Leu Ala Ala Thr Val
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<210> 181
 <211> 20
 <212> PRT
 <213> Dengue virus signal peptide

<400> 181

Arg Arg Arg Thr Ala Gly Met Ile Ile Met Leu Ile Pro Thr Val Met
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Ala Phe His Leu
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<210> 182
<211> 24
<212> PRT
<213> West Nile virus signal peptide

<400> 182

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Ala Cys Ala Gly Ala Val Thr Leu
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<210> 183
<211> 28
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<213> Japanese encephalitis signal peptide 1

<400> 183

Asn Lys Arg Gly Gly Asn Glu Gly Ser Ile Met Trp Leu Ala Ser Leu
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Ala Val Val Ile Ala Tyr Ala Gly Ala Met Lys Leu
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<210> 184
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<212> PRT
<213> Japanese encephalitis SA-14 JE isolate (GenBank accession # M55506)
signal peptide 2

<400> 184

Met Gly Lys Arg Ser Ala Gly Ser Ile Met Trp Leu Ala Ser Leu Ala
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Val Val Ile Ala Cys Ala Gly Ala
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<210> 185
<211> 56
<212> PRT
<213> Tick-borne encephalitis virus stem anchor sequence

<400> 185

Lys Gly Ser Ser Ile Gly Arg Val Phe Gln Lys Thr Lys Lys Gly Ile
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Glu Arg Leu Thr Val Ile Gly Glu His Ala Trp Asp Phe Gly Ser Ala
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Gly Gly Phe Leu Ser Ser Ile Gly Lys Ala Val His Thr Val Leu Gly
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Gly Ala Phe Asn Ser Ile Phe Gly
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<212> PRT
<213> Dengue virus stem anchor sequence 1

<400> 186

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Arg Arg Met Ala Ile Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Ile
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Gly Gly Val Phe Thr Ser Val Gly Lys Leu Val His Gln Ile Phe Gly
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Thr Ala Tyr Gly Val Leu Phe Ser
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<212> PRT
<213> Dengue virus stem anchor sequence 2

<400> 187

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Lys Arg Met Ala Ile Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Leu
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Gly Gly Val Phe Thr Ser Ile Gly Lys Ala Leu His Gln Val Phe Gly
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Ala Ile Tyr Gly Ala Ala Phe Ser
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<210> 188
<211> 56
<212> PRT
<213> Japanese encephalitis stem anchor sequence

<400> 188

Ala Gly Ser Thr Leu Gly Lys Ala Phe Ser Thr Thr Leu Lys Gly Ala
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Gln Arg Leu Ala Ala Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Ile
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Gly Gly Val Phe Asn Ser Ile Gly Lys Ala Val His Gln Val Phe Gly
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Gly Ala Phe Arg Thr Leu Phe Gly
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<210> 189
<211> 56
<212> PRT
<213> St. Louis encephalitis virus stem anchor sequence

<400> 189

Glu Gly Ser Ser Ile Gly Lys Ala Leu Ala Thr Thr Trp Lys Gly Ala
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Gln Arg Leu Ala Val Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Ile
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Gly Gly Val Phe Asn Ser Ile Gly Lys Ala Val His Gln Val Phe Gly
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Gly Ala Phe Arg Thr Leu Phe Gly
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<210> 190
<211> 56
<212> PRT
<213> West Nile virus stem anchor sequence

<400> 190

Ser Gly Ser Ser Ile Gly Lys Ala Phe Thr Thr Thr Leu Lys Gly Ala
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Gln Arg Leu Ala Ala Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val
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Gly Gly Val Phe Thr Ser Val Gly Lys Ala Val His Gln Val Phe Gly
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Gly Ala Phe Arg Ser Leu Phe Gly
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<210> 191
<211> 56
<212> PRT
<213> Yellow fever virus encephalitis sequence

<400> 191

Glu Gly Ser Ser Ile Gly Lys Leu Phe Thr Gln Thr Met Lys Gly Ala
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Glu Arg Leu Ala Val Met Gly Asp Ala Ala Trp Asp Phe Ser Ser Ala
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Gly Gly Phe Phe Thr Ser Val Gly Lys Gly Ile His Thr Val Phe Gly
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Ser Ala Phe Gln Gly Leu Phe Gly
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