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<151> 2018-09-05

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<150> EP19 154 334.7

<151> 2019-01-29

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<151> 2019-03-07

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Lys Glu Lys Pro Val Asn Ile Glu Ala Glu Pro Pro Phe Gly Glu Ser
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Tyr Ile Val Val Gly Ala Gly Glu Lys Ala Leu Lys Leu Ser Trp Phe
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Lys Lys Gly Ser Ser Ile Gly Lys Met Phe Glu Ala Thr Ala Arg Gly
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Ala Arg Arg Met Ala Ile Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser
690 695 700

Ile Gly Gly Val Phe Thr Ser Met Gly Lys Leu Val His Gln Val Phe
705 710 715 720

Gly Thr Ala Tyr Gly Val Leu Phe Ser Gly Val Ser Trp Thr Met Lys
725 730 735

Ile Gly Ile Gly Ile Leu Leu Thr Trp Leu Gly Leu Asn Ser Arg Asn
740 745 750

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

Leu Gly Val Met Val Gln Ala Asp Ser Gly Cys Val Val Ser Trp Lys
770 775 780

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

His Thr Trp Thr Glu Gln Tyr Lys Phe Gln Pro Glu Ser Pro Ser Lys
805 810 815

Leu Ala Ser Ala Ile Gln Lys Ala His Glu Glu Asp Ile Cys Gly Ile
820 825 830

Arg Ser Val Thr Arg Leu Glu Asn Leu Met Trp Lys Gln Ile Thr Pro
835 840 845

Glu Leu Asn His Ile Leu Ser Glu Asn Glu Val Lys Leu Thr Ile Met
850 855 860

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

Pro Gln Pro Thr Glu Leu Lys Tyr Ser Trp Lys Thr Trp Gly Lys Ala
885 890 895

Lys Met Leu Ser Thr Glu Ser His Asn Gln Thr Phe Leu Ile Asp Gly
900 905 910

Pro Glu Thr Ala Glu Cys Pro Asn Thr Asn Arg Ala Trp Asn Ser Leu
915 920 925

Glu Val Glu Asp Tyr Gly Phe Gly Val Phe Thr Thr Asn Ile Trp Leu
930 935 940

Lys Leu Lys Glu Lys Gln Asp Val Phe Cys Asp Ser Lys Leu Met Ser
945 950 955 960

Ala Ala Ile Lys Asp Asn Arg Ala Val His Ala Asp Met Gly Tyr Trp
965 970 975

Ile Glu Ser Ala Leu Asn Asp Thr Trp Lys Ile Glu Lys Ala Ser Phe
980 985 990

Ile Glu Val Lys Asn Cys His Trp Pro Lys Ser His Thr Leu Trp Ser
995 1000 1005

Asn Gly Val Leu Glu Ser Glu Met Ile Ile Pro Lys Asn Leu Ala
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Gly Pro Val Ser Gln His Asn Tyr Arg Pro Gly Tyr His Thr Gln
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Ile Thr Gly Pro Trp His Leu Gly Lys Leu Glu Met Asp Phe Asp
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Phe Cys Asp Gly Thr Thr Val Val Val Thr Glu Asp Cys Gly Asn
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Arg Gly Pro Ser Leu Arg Thr Thr Thr Ala Ser Gly Lys Leu Ile
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Thr Glu Trp Cys Cys Arg Ser Cys Thr Leu Pro Pro Leu Arg Tyr
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Arg Gly Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Leu
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Lys Glu Lys Glu Glu Asn Leu Val Asn Ser Leu Val Thr Ala Gly
1115 1120 1125

His Gly Gln Val Asp Asn Phe Ser Leu Gly Val Leu Gly Met Ala
1130 1135 1140

Leu Phe Leu Glu Glu Met Leu Arg Thr Arg Val Gly Thr Lys His
1145 1150 1155

Ala Ile Leu Leu Val Ala Val Ser Phe Val Thr Leu Ile Thr Gly
1160 1165 1170

Asn Met Ser Phe Arg Asp Leu Gly Arg Val Met Val Met Val Gly
1175 1180 1185

Ala Thr Met Thr Asp Asp Ile Gly Met Gly Val Thr Tyr Leu Ala
1190 1195 1200

Leu Leu Ala Ala Phe Lys Val Arg Pro Thr Phe Ala Ala Gly Leu
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Leu Leu Arg Lys Leu Thr Ser Lys Glu Leu Met Met Thr Thr Ile
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Gly Ile Val Leu Leu Ser Gln Ser Thr Leu Pro Glu Thr Ile Leu
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Glu Leu Thr Asp Ala Leu Ala Leu Gly Met Met Val Leu Lys Met
1250 1255 1260

Val Arg Asn Met Glu Lys Tyr Gln Leu Ala Val Thr Ile Met Ala
1265 1270 1275

Ile Leu Cys Val Pro Asn Ala Val Ile Leu Gln Asn Ala Trp Lys
1280 1285 1290

Val Ser Cys Thr Ile Leu Ala Val Val Ser Val Ser Pro Leu Phe
1295 1300 1305

Leu Thr Ser Ser Gln Gln Lys Thr Asp Trp Ile Pro Leu Ala Leu
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Thr Ile Lys Gly Leu Asn Pro Thr Ala Ile Phe Leu Thr Thr Leu
1325 1330 1335

Ser Arg Thr Ser Lys Lys Arg Ser Trp Pro Leu Asn Glu Ala Ile
1340 1345 1350

Met Ala Val Gly Met Val Ser Ile Leu Ala Ser Ser Leu Leu Lys
1355 1360 1365

Asn Asp Ile Pro Met Thr Gly Pro Leu Val Ala Gly Gly Leu Leu
1370 1375 1380

Thr Val Cys Tyr Val Leu Thr Gly Arg Ser Ala Asp Leu Glu Leu
1385 1390 1395

Glu Arg Ala Ala Asp Val Lys Trp Glu Asp Gln Ala Glu Ile Ser
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Gly Ser Ser Pro Ile Leu Ser Ile Thr Ile Ser Glu Asp Gly Ser
1415 1420 1425

Met Ser Ile Lys Asn Glu Glu Glu Asp Gln Thr Leu Thr Ile Leu
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Ile Arg Thr Gly Leu Leu Val Ile Ser Gly Leu Phe Pro Val Ser
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Ile Pro Ile Thr Ala Ala Ala Trp Tyr Leu Trp Glu Val Lys Lys
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Gln Arg Ala Gly Val Leu Trp Asp Val Pro Ser Pro Pro Pro Met
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Gly Thr Phe His Thr Met Trp His Val Thr Arg Gly Ala Val Leu
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Met His Lys Gly Lys Arg Ile Glu Pro Ser Trp Ala Asp Val Lys
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Lys Asp Leu Ile Ser Tyr Gly Gly Gly Trp Lys Leu Glu Gly Glu
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Trp Lys Glu Gly Glu Glu Val Gln Val Leu Ala Leu Glu Pro Gly
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Lys Asn Pro Arg Ala Val Gln Thr Lys Pro Gly Leu Phe Lys Thr
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Asn Ala Gly Thr Ile Gly Ala Val Ser Leu Asp Phe Ser Pro Gly
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Thr Ser Gly Ser Pro Ile Ile Asp Lys Lys Gly Lys Val Val Gly
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Leu Tyr Gly Asn Gly Val Val Thr Arg Ser Gly Ala Tyr Val Ser
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Ala Ile Ala Gln Thr Glu Lys Ser Ile Glu Asp Asn Pro Glu Ile
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Glu Asp Asp Ile Phe Arg Lys Arg Arg Leu Thr Ile Met Asp Leu
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His Pro Gly Ala Gly Lys Thr Lys Arg Tyr Leu Pro Ala Ile Val
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Pro Ile Arg Tyr Gln Thr Pro Ala Ile Arg Ala Val His Thr Gly
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Asp Glu Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly
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Trp Asn Ser Gly His Glu Trp Val Thr Asp Phe Lys Gly Lys Thr
1820 1825 1830

Val Trp Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Ala
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Cys Leu Arg Lys Asn Gly Lys Lys Val Ile Gln Leu Ser Arg Lys
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1880 1885 1890

Ala Glu Arg Val Ile Asp Pro Arg Arg Cys Met Lys Pro Val Ile
1895 1900 1905

Leu Thr Asp Gly Glu Glu Arg Val Ile Leu Ala Gly Pro Met Pro
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Val Thr His Ser Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg
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Asn Pro Lys Asn Glu Asn Asp Gln Tyr Ile Tyr Met Gly Glu Pro
1940 1945 1950

Leu Glu Asn Asp Glu Asp Cys Ala His Trp Lys Glu Ala Lys Met
1955 1960 1965

Leu Leu Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile Pro Ser Met
1970 1975 1980

Phe Glu Pro Glu Arg Glu Lys Val Asp Ala Ile Asp Gly Glu Tyr
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Arg Leu Arg Gly Glu Ala Arg Lys Thr Phe Val Asp Leu Met Arg
2000 2005 2010

Arg Gly Asp Leu Pro Val Trp Leu Ala Tyr Arg Val Ala Ala Glu
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Gly Ile Asn Tyr Ala Asp Arg Arg Trp Cys Phe Asp Gly Val Lys
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Asn Asn Gln Ile Leu Glu Glu Asn Val Glu Val Glu Ile Trp Thr
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Lys Glu Gly Glu Arg Lys Lys Leu Lys Pro Arg Trp Leu Asp Ala
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Arg Ile Tyr Ser Asp Pro Leu Ala Leu Lys Glu Phe Lys Glu Phe
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Ala Ala Gly Arg Lys Ser Leu Thr Leu Asn Leu Ile Thr Glu Met
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Gly Arg Leu Pro Thr Phe Met Thr Gln Lys Ala Arg Asp Ala Leu
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Asp Asn Leu Ala Val Leu His Thr Ala Glu Ala Gly Gly Arg Ala
2120 2125 2130

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2150						2155					2160			
Phe	Leu	Met	Ser	Ala	Arg	Gly	Ile	Gly	Lys	Met	Thr	Leu	Gly	Met
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Cys	Cys	Ile	Ile	Thr	Ala	Ser	Ile	Leu	Leu	Trp	Tyr	Ala	Gln	Ile
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Gln	Pro	His	Trp	Ile	Ala	Ala	Ser	Ile	Ile	Leu	Glu	Phe	Phe	Leu
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Ile	Val	Leu	Leu	Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Thr	Pro	Gln
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Cys Glu Ala Leu Thr Leu Ala Thr Gly Pro Ile Ser Thr Leu Trp
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Glu Gly Asn Pro Gly Arg Phe Trp Asn Thr Thr Ile Ala Val Ser
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Met Ala Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Gly Leu
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Leu Phe Ser Ile Met Lys Asn Thr Thr Asn Thr Arg Arg Gly Thr
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Gln	Arg	Lys	Tyr	Gly	Gly	Ala	Leu	Val	Arg	Asn	Pro	Leu	Ser	Arg
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Glu Gly Glu His Lys Lys Leu Ala Glu Ala Ile Phe Lys Leu Thr
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Tyr Gln Asn Lys Val Val Arg Val Gln Arg Pro Thr Pro Arg Gly
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Thr Val Met Asp Ile Ile Ser Arg Arg Asp Gln Arg Gly Ser Gly
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Gln Leu Ile Arg Gln Met Glu Gly Glu Gly Val Phe Lys Ser Ile
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Gln His Leu Thr Ile Thr Glu Glu Ile Ala Val Gln Asn Trp Leu
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Val Leu Val Val Pro Cys Arg Asn Gln Asp Glu Leu Ile Gly Arg
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Ala Arg Ile Ser Gln Gly Ala Gly Trp Ser Leu Arg Glu Thr Ala
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Cys Leu Gly Lys Ser Tyr Ala Gln Met Trp Ser Leu Met Tyr Phe
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His Arg Arg Asp Leu Arg Leu Ala Ala Asn Ala Ile Cys Ser Ala
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Val Pro Ser His Trp Val Pro Thr Ser Arg Thr Thr Trp Ser Ile
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His Ala Lys His Glu Trp Met Thr Thr Glu Asp Met Leu Thr Val
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Ala Leu Val Ala Phe Leu Arg Phe Leu Thr Ile Pro Pro Thr Ala Gly
50 55 60

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

Leu Arg Gly Phe Arg Lys Glu Ile Gly Arg Met Leu Asn Ile Leu Asn
85 90 95

Arg Arg Arg Arg Ser Ala Gly Met Ile Ile Met Leu Ile Pro Thr Val
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Pro Glu Thr Ala Glu Cys Pro Asn Thr Asn Arg Ala Trp Asn Ser Leu
915 920 925

Glu Val Glu Asp Tyr Gly Phe Gly Val Phe Thr Thr Asn Ile Trp Leu
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1880 1885 1890

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ggagcacgct	tcttagagtt	tgaagcccta	ggattcttaa	atgaagatca	ctggttctcc	9060
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acaagaatca	cactagaaga	cctaaaaaat	gaagaaatgg	taacaaacca	catggaagga	9240
gaacacaaga	aactagccga	ggccattttc	aaactaacgt	acaaaacaa	ggtggtgcgt	9300
gtgcaaagac	caacaccaag	aggcacagta	atggacatca	tatcgagaag	agaccaaaga	9360
ggtagtggac	aagttggcac	ctatggactc	aatactttca	ccaatatgga	agcccaacta	9420
atcagacaga	tggagggaga	aggagtcttt	aaaagcattc	agcacctaac	aatcacagaa	9480
gaaatcgctg	tgcaaaactg	gttagcaaga	gtggggcgcg	aaaggttatc	aagaatggcc	9540
atcagtggag	atgatttgtt	tgtgaaacct	ttagatgaca	ggttcgcaag	cgctttaaca	9600
gctctaaatg	acatgggaaa	gattaggaaa	gacatacaac	aatgggaacc	ttcaagagga	9660
tggaatgatt	ggacacaagt	gcccttctgt	tcacaccatt	tccatgagtt	aatcatgaaa	9720
gacggtcgcg	tactcgttgt	tccatgtaga	aaccaagatg	aactgattgg	cagagcccga	9780
atctcccaag	gagcagggtg	gtctttgcgg	gagacggcct	gtttggggaa	gtcttacgcc	9840
caaatgtgga	gcttgatgta	cttcacaga	cgcgacctca	ggctggcggc	aaatgctatt	9900
tgctcggcag	taccatcaca	ttgggttcca	acaagtcgaa	caacctggtc	catacatgct	9960
aaacatgaat	ggatgacaac	ggaagacatg	ctgacagtct	ggaacagggt	gtggattcaa	10020
gaaaacccat	ggatggaaga	caaaactcca	gtggaatcat	gggaggaaaat	cccatacttg	10080
gggaaaagag	aagaccaatg	gtgcgggtca	ttgattgggt	taacaagcag	ggccacctgg	10140
gcaaagaaca	tccaagcagc	aataaatcaa	gttagatccc	ttataggcaa	tgaagaatac	10200
acagattaca	tgccatccat	gaaaagattc	agaagagaag	aggaagaagc	aggagtcttg	10260

tggtagaaag caaaactaac atgaaacaag gctagaagtc aggtcggatt aagccatagt	10320
acggaaaaaa ctatgctacc tgtgagcccc gtccaaggac gttaaaagaa gtcaggccat	10380
cataaatgcc atagcttgag taaactatgc agcctgtagc tccacctgag aaggtgtaaa	10440
aaatccggga ggccacaaac catggaagct gtacgcatgg cgtagtggac tagcggttag	10500
aggagacccc tcccttacia atcgagcaa caatgggggc ccaaggcgag atgaagctgt	10560
agtctcgctg gaaggactag aggttagagg agaccccccc gaaacaaaaa acagcatatt	10620
gacgctggga aagaccagag atcctgctgt ctcctcagca tcattccagg cacagaacgc	10680
cagaaaatgg aatggtgctg ttgaatcaac aggttct	10717

<210> 6
 <211> 3389
 <212> PRT
 <213> chimeric dengue serotype 2/3 (MVS)

<400> 6

Met	Asn	Asn	Gln	Arg	Lys	Lys	Ala	Lys	Asn	Thr	Pro	Phe	Asn	Met	Leu
1				5					10					15	

Lys	Arg	Glu	Arg	Asn	Arg	Val	Ser	Thr	Val	Gln	Gln	Leu	Thr	Lys	Arg
		20						25					30		

Phe	Ser	Leu	Gly	Met	Leu	Gln	Gly	Arg	Gly	Pro	Leu	Lys	Leu	Phe	Met
		35					40					45			

Ala	Leu	Val	Ala	Phe	Leu	Arg	Phe	Leu	Thr	Ile	Pro	Pro	Thr	Ala	Gly
	50					55					60				

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

Leu	Arg	Gly	Phe	Arg	Lys	Glu	Ile	Gly	Arg	Met	Leu	Asn	Ile	Leu	Asn
			85						90					95	

Arg	Arg	Arg	Arg	Ser	Ala	Gly	Met	Ile	Ile	Met	Leu	Ile	Pro	Thr	Val
			100					105					110		

Met	Ala	Phe	His	Leu	Thr	Thr	Arg	Asp	Gly	Glu	Pro	Arg	Met	Ile	Val
		115					120					125			

Gly Lys Asn Glu Arg Gly Lys Ser Leu Leu Phe Lys Thr Ala Ser Gly
130 135 140

Ile Asn Met Cys Thr Leu Ile Ala Met Asp Leu Gly Glu Met Cys Asp
145 150 155 160

Asp Thr Val Thr Tyr Lys Cys Pro His Ile Thr Glu Val Glu Pro Glu
165 170 175

Asp Ile Asp Cys Trp Cys Asn Leu Thr Ser Thr Trp Val Thr Tyr Gly
180 185 190

Thr Cys Asn Gln Ala Gly Glu His Arg Arg Asp Lys Arg Ser Val Ala
195 200 205

Leu Ala Pro His Val Gly Met Gly Leu Asp Thr Arg Thr Gln Thr Trp
210 215 220

Met Ser Ala Glu Gly Ala Trp Arg Gln Val Glu Lys Val Glu Thr Trp
225 230 235 240

Ala Leu Arg His Pro Gly Phe Thr Ile Leu Ala Leu Phe Leu Ala His
245 250 255

Tyr Ile Gly Thr Ser Leu Thr Gln Lys Val Val Ile Phe Ile Leu Leu
260 265 270

Met Leu Val Thr Pro Ser Met Thr Met Arg Cys Val Gly Val Gly Asn
275 280 285

Arg Asp Phe Val Glu Gly Leu Ser Gly Ala Thr Trp Val Asp Val Val
290 295 300

Leu Glu His Gly Gly Cys Val Thr Thr Met Ala Lys Asn Lys Pro Thr
305 310 315 320

Leu Asp Ile Glu Leu Gln Lys Thr Glu Ala Thr Gln Leu Ala Thr Leu
325 330 335

Arg Lys Leu Cys Ile Glu Gly Lys Ile Thr Asn Ile Thr Thr Asp Ser
340 345 350

Arg Cys Pro Thr Gln Gly Glu Ala Ile Leu Pro Glu Glu Gln Asp Gln
355 360 365

Asn Tyr Val Cys Lys His Thr Tyr Val Asp Arg Gly Trp Gly Asn Gly
370 375 380

Cys Gly Leu Phe Gly Lys Gly Ser Leu Val Thr Cys Ala Lys Phe Gln
385 390 395 400

Cys Leu Glu Ser Ile Glu Gly Lys Val Val Gln His Glu Asn Leu Lys
405 410 415

Tyr Thr Val Ile Ile Thr Val His Thr Gly Asp Gln His Gln Val Gly
420 425 430

Asn Glu Thr Gln Gly Val Thr Ala Glu Ile Thr Pro Gln Ala Ser Thr
435 440 445

Ala Glu Ala Ile Leu Pro Glu Tyr Gly Thr Leu Gly Leu Glu Cys Ser
450 455 460

Pro Arg Thr Gly Leu Asp Phe Asn Glu Met Ile Ser Leu Thr Met Lys
465 470 475 480

Asn Lys Ala Trp Met Val His Arg Gln Trp Phe Phe Asp Leu Pro Leu
485 490 495

Pro Trp Thr Ser Gly Ala Ser Ala Glu Thr Pro Thr Trp Asn Arg Lys
500 505 510

Glu Leu Leu Val Thr Phe Lys Asn Ala His Ala Lys Lys Gln Glu Val
515 520 525

Val Val Leu Gly Ser Gln Glu Gly Ala Met His Thr Ala Leu Thr Gly
530 535 540

Ala Thr Glu Ile Gln Thr Ser Gly Gly Thr Ser Ile Phe Ala Gly His
545 550 555 560

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

Tyr Ala Met Cys Leu Ser Ser Phe Val Leu Lys Lys Glu Val Ser Glu
580 585 590

Thr Gln His Gly Thr Ile Leu Ile Lys Val Glu Tyr Lys Gly Glu Asp
595 600 605

Ala Pro Cys Lys Ile Pro Phe Ser Thr Glu Asp Gly Gln Gly Lys Ala
610 615 620

Leu Asn Gly Arg Leu Ile Thr Ala Asn Pro Val Val Thr Lys Lys Glu
625 630 635 640

Glu Pro Val Asn Ile Glu Ala Glu Pro Pro Phe Gly Glu Ser Asn Ile
645 650 655

Val Ile Gly Ile Gly Asp Lys Ala Leu Lys Ile Asn Trp Tyr Lys Lys
660 665 670

Gly Ser Ser Ile Gly Lys Met Phe Glu Ala Thr Ala Arg Gly Ala Arg
675 680 685

Arg Met Ala Ile Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly
690 695 700

Gly Val Leu Asn Ser Leu Gly Lys Met Val His Gln Ile Phe Gly Ser
705 710 715 720

Ala Tyr Thr Ala Leu Phe Gly Gly Val Ser Trp Met Met Lys Ile Gly
725 730 735

Ile Gly Val Leu Leu Thr Trp Ile Gly Leu Asn Ser Lys Asn Thr Ser
740 745 750

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

Val Met Val Gln Ala Asp Ser Gly Cys Val Val Ser Trp Lys Asn Lys
770 775 780

Glu Leu Lys Cys Gly Ser Gly Ile Phe Ile Thr Asp Asn Val His Thr
785 790 795 800

Trp Thr Glu Gln Tyr Lys Phe Gln Pro Glu Ser Pro Ser Lys Leu Ala
805 810 815

Ser Ala Ile Gln Lys Ala His Glu Glu Asp Ile Cys Gly Ile Arg Ser
820 825 830

Val Thr Arg Leu Glu Asn Leu Met Trp Lys Gln Ile Thr Pro Glu Leu
835 840 845

Asn His Ile Leu Ser Glu Asn Glu Val Lys Leu Thr Ile Met Thr Gly
850 855 860

Asp Ile Lys Gly Ile Met Gln Ala Gly Lys Arg Ser Leu Arg Pro Gln
865 870 875 880

Pro Thr Glu Leu Lys Tyr Ser Trp Lys Thr Trp Gly Lys Ala Lys Met
885 890 895

Leu Ser Thr Glu Ser His Asn Gln Thr Phe Leu Ile Asp Gly Pro Glu
900 905 910

Thr Ala Glu Cys Pro Asn Thr Asn Arg Ala Trp Asn Ser Leu Glu Val
915 920 925

Glu Asp Tyr Gly Phe Gly Val Phe Thr Thr Asn Ile Trp Leu Lys Leu
930 935 940

Lys Glu Lys Gln Asp Val Phe Cys Asp Ser Lys Leu Met Ser Ala Ala
945 950 955 960

Ile Lys Asp Asn Arg Ala Val His Ala Asp Met Gly Tyr Trp Ile Glu
965 970 975

Ser Ala Leu Asn Asp Thr Trp Lys Ile Glu Lys Ala Ser Phe Ile Glu
980 985 990

Val Lys Asn Cys His Trp Pro Lys Ser His Thr Leu Trp Ser Asn Gly
995 1000 1005

Val Leu Glu Ser Glu Met Ile Ile Pro Lys Asn Leu Ala Gly Pro
1010 1015 1020

Val Ser Gln His Asn Tyr Arg Pro Gly Tyr His Thr Gln Ile Thr
1025 1030 1035

Gly Pro Trp His Leu Gly Lys Leu Glu Met Asp Phe Asp Phe Cys
1040 1045 1050

Asp Gly Thr Thr Val Val Val Thr Glu Asp Cys Gly Asn Arg Gly
1055 1060 1065

Pro Ser Leu Arg Thr Thr Thr Ala Ser Gly Lys Leu Ile Thr Glu
1070 1075 1080

Trp Cys Cys Arg Ser Cys Thr Leu Pro Pro Leu Arg Tyr Arg Gly
1085 1090 1095

Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Leu Lys Glu
1100 1105 1110

Lys Glu Glu Asn Leu Val Asn Ser Leu Val Thr Ala Gly His Gly
1115 1120 1125

Gln Val Asp Asn Phe Ser Leu Gly Val Leu Gly Met Ala Leu Phe
1130 1135 1140

Leu Glu Glu Met Leu Arg Thr Arg Val Gly Thr Lys His Ala Ile
1145 1150 1155

Leu Leu Val Ala Val Ser Phe Val Thr Leu Ile Thr Gly Asn Met
1160 1165 1170

Ser Phe Arg Asp Leu Gly Arg Val Met Val Met Val Gly Ala Thr
1175 1180 1185

Met	Thr	Asp	Asp	Ile	Gly	Met	Gly	Val	Thr	Tyr	Leu	Ala	Leu	Leu
1190						1195					1200			
Ala	Ala	Phe	Lys	Val	Arg	Pro	Thr	Phe	Ala	Ala	Gly	Leu	Leu	Leu
1205						1210					1215			
Arg	Lys	Leu	Thr	Ser	Lys	Glu	Leu	Met	Met	Thr	Thr	Ile	Gly	Ile
1220						1225					1230			
Val	Leu	Leu	Ser	Gln	Ser	Thr	Ile	Pro	Glu	Thr	Ile	Leu	Glu	Leu
1235						1240					1245			
Thr	Asp	Ala	Leu	Ala	Leu	Gly	Met	Met	Val	Leu	Lys	Met	Val	Arg
1250						1255					1260			
Asn	Met	Glu	Lys	Tyr	Gln	Leu	Ala	Val	Thr	Ile	Met	Ala	Ile	Leu
1265						1270					1275			
Cys	Val	Pro	Asn	Ala	Val	Ile	Leu	Gln	Asn	Ala	Trp	Lys	Val	Ser
1280						1285					1290			
Cys	Thr	Ile	Leu	Ala	Val	Val	Ser	Val	Ser	Pro	Leu	Phe	Leu	Thr
1295						1300					1305			
Ser	Ser	Gln	Gln	Lys	Thr	Asp	Trp	Ile	Pro	Leu	Ala	Leu	Thr	Ile
1310						1315					1320			
Lys	Gly	Leu	Asn	Pro	Thr	Ala	Ile	Phe	Leu	Thr	Thr	Leu	Ser	Arg
1325						1330					1335			
Thr	Ser	Lys	Lys	Arg	Ser	Trp	Pro	Leu	Asn	Glu	Ala	Ile	Met	Ala
1340						1345					1350			
Val	Gly	Met	Val	Ser	Ile	Leu	Ala	Ser	Ser	Leu	Leu	Lys	Asn	Asp
1355						1360					1365			
Ile	Pro	Met	Thr	Gly	Pro	Leu	Val	Ala	Gly	Gly	Leu	Leu	Thr	Val
1370						1375					1380			
Cys	Tyr	Val	Leu	Thr	Gly	Arg	Ser	Ala	Asp	Leu	Glu	Leu	Glu	Arg
1385						1390					1395			

Ala Ala Asp Val Lys Trp Glu Asp Gln Ala Glu Ile Ser Gly Ser
1400 1405 1410

Ser Pro Ile Leu Ser Ile Thr Ile Ser Glu Asp Gly Ser Met Ser
1415 1420 1425

Ile Lys Asn Glu Glu Glu Glu Gln Thr Leu Thr Ile Leu Ile Arg
1430 1435 1440

Thr Gly Leu Leu Val Ile Ser Gly Leu Phe Pro Val Ser Ile Pro
1445 1450 1455

Ile Thr Ala Ala Ala Trp Tyr Leu Trp Glu Val Lys Lys Gln Arg
1460 1465 1470

Ala Gly Val Leu Trp Asp Val Pro Ser Pro Pro Pro Met Gly Lys
1475 1480 1485

Ala Glu Leu Glu Asp Gly Ala Tyr Arg Ile Lys Gln Lys Gly Ile
1490 1495 1500

Leu Gly Tyr Ser Gln Ile Gly Ala Gly Val Tyr Lys Glu Gly Thr
1505 1510 1515

Phe His Thr Met Trp His Val Thr Arg Gly Ala Val Leu Met His
1520 1525 1530

Lys Gly Lys Arg Ile Glu Pro Ser Trp Ala Asp Val Lys Lys Asp
1535 1540 1545

Leu Ile Ser Tyr Gly Gly Gly Trp Lys Leu Glu Gly Glu Trp Lys
1550 1555 1560

Glu Gly Glu Glu Val Gln Val Leu Ala Leu Glu Pro Gly Lys Asn
1565 1570 1575

Pro Arg Ala Val Gln Thr Lys Pro Gly Leu Phe Lys Thr Asn Ala
1580 1585 1590

Gly Thr Ile Gly Ala Val Ser Leu Asp Phe Ser Pro Gly Thr Ser
1595 1600 1605

Gly Ser Pro Ile Ile Asp Lys Lys Gly Lys Val Val Gly Leu Tyr
1610 1615 1620

Gly Asn Gly Val Val Thr Arg Ser Gly Ala Tyr Val Ser Ala Ile
1625 1630 1635

Ala Gln Thr Glu Lys Ser Ile Glu Asp Asn Pro Glu Ile Glu Asp
1640 1645 1650

Asp Ile Phe Arg Lys Arg Arg Leu Thr Ile Met Asp Leu His Pro
1655 1660 1665

Gly Ala Gly Lys Thr Lys Arg Tyr Leu Pro Ala Ile Val Arg Glu
1670 1675 1680

Ala Ile Lys Arg Gly Leu Arg Thr Leu Ile Leu Ala Pro Thr Arg
1685 1690 1695

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Ile
1700 1705 1710

Arg Tyr Gln Thr Pro Ala Ile Arg Ala Val His Thr Gly Arg Glu
1715 1720 1725

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Met Arg Leu Leu
1730 1735 1740

Ser Pro Val Arg Val Pro Asn Tyr Asn Leu Ile Ile Met Asp Glu
1745 1750 1755

Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly Tyr Ile
1760 1765 1770

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Gly Ile Phe Met Thr
1775 1780 1785

Ala Thr Pro Pro Gly Ser Arg Asp Pro Phe Pro Gln Ser Asn Ala
1790 1795 1800

Pro Ile Ile Asp Glu Glu Arg Glu Ile Pro Glu Arg Ser Trp Asn
1805 1810 1815

Ser Gly His Glu Trp Val Thr Asp Phe Lys Gly Lys Thr Val Trp
1820 1825 1830

Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Ala Cys Leu
1835 1840 1845

Arg Lys Asn Gly Lys Lys Val Ile Gln Leu Ser Arg Lys Thr Phe
1850 1855 1860

Asp Ser Glu Tyr Val Lys Thr Arg Thr Asn Asp Trp Asp Phe Val
1865 1870 1875

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Glu
1880 1885 1890

Arg Val Ile Asp Pro Arg Arg Cys Met Lys Pro Val Ile Leu Thr
1895 1900 1905

Asp Gly Glu Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr
1910 1915 1920

His Ser Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro
1925 1930 1935

Lys Asn Glu Asn Asp Gln Tyr Ile Tyr Met Gly Glu Pro Leu Glu
1940 1945 1950

Asn Asp Glu Asp Cys Ala His Trp Lys Glu Ala Lys Met Leu Leu
1955 1960 1965

Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile Pro Ser Met Phe Glu
1970 1975 1980

Pro Glu Arg Glu Lys Val Asp Ala Ile Asp Gly Glu Tyr Arg Leu
1985 1990 1995

Arg 2000	Gly	Glu	Ala	Arg	Lys	Thr 2005	Phe	Val	Asp	Leu	Met 2010	Arg	Arg	Gly
Asp 2015	Leu	Pro	Val	Trp	Leu	Ala 2020	Tyr	Arg	Val	Ala	Ala 2025	Glu	Gly	Ile
Asn 2030	Tyr	Ala	Asp	Arg	Arg	Trp 2035	Cys	Phe	Asp	Gly	Val 2040	Lys	Asn	Asn
Gln 2045	Ile	Leu	Glu	Glu	Asn	Val 2050	Glu	Val	Glu	Ile	Trp 2055	Thr	Lys	Glu
Gly 2060	Glu	Arg	Lys	Lys	Leu	Lys 2065	Pro	Arg	Trp	Leu	Asp 2070	Ala	Arg	Ile
Tyr 2075	Ser	Asp	Pro	Leu	Ala	Leu 2080	Lys	Glu	Phe	Lys	Glu 2085	Phe	Ala	Ala
Gly 2090	Arg	Lys	Ser	Leu	Thr	Leu 2095	Asn	Leu	Ile	Thr	Glu 2100	Met	Gly	Arg
Leu 2105	Pro	Thr	Phe	Met	Thr	Gln 2110	Lys	Ala	Arg	Asp	Ala 2115	Leu	Asp	Asn
Leu 2120	Ala	Val	Leu	His	Thr	Ala 2125	Glu	Ala	Gly	Gly	Arg 2130	Ala	Tyr	Asn
His 2135	Ala	Leu	Ser	Glu	Leu	Pro 2140	Glu	Thr	Leu	Glu	Thr 2145	Leu	Leu	Leu
Leu 2150	Thr	Leu	Leu	Ala	Thr	Val 2155	Thr	Gly	Gly	Ile	Phe 2160	Leu	Phe	Leu
Met 2165	Ser	Ala	Arg	Gly	Ile	Gly 2170	Lys	Met	Thr	Leu	Gly 2175	Met	Cys	Cys
Ile 2180	Ile	Thr	Ala	Ser	Ile	Leu 2185	Leu	Trp	Tyr	Ala	Gln 2190	Ile	Gln	Pro
His 2195	Trp	Ile	Ala	Ala	Ser	Ile 2200	Ile	Leu	Glu	Phe	Phe 2205	Leu	Ile	Val

Leu Leu Ile Pro Glu Pro Glu Lys Gln Arg Thr Pro Gln Asp Asn
2210 2215 2220

Gln Leu Thr Tyr Val Val Ile Ala Ile Leu Thr Val Val Ala Ala
2225 2230 2235

Thr Met Ala Asn Glu Met Gly Phe Leu Glu Lys Thr Lys Lys Asp
2240 2245 2250

Leu Gly Leu Gly Ser Ile Ala Thr Gln Gln Pro Glu Ser Asn Ile
2255 2260 2265

Leu Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Thr Leu Tyr Ala
2270 2275 2280

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

Asn Ser Ser Val Asn Val Ser Leu Thr Ala Ile Ala Asn Gln Ala
2300 2305 2310

Thr Val Leu Met Gly Leu Gly Lys Gly Trp Pro Leu Ser Lys Met
2315 2320 2325

Asp Ile Gly Val Pro Leu Leu Ala Ile Gly Cys Tyr Ser Gln Val
2330 2335 2340

Asn Pro Ile Thr Leu Thr Ala Ala Leu Phe Leu Leu Val Ala His
2345 2350 2355

Tyr Ala Ile Ile Gly Pro Gly Leu Gln Ala Lys Ala Thr Arg Glu
2360 2365 2370

Ala Gln Lys Arg Ala Ala Ala Gly Ile Met Lys Asn Pro Thr Val
2375 2380 2385

Asp Gly Ile Thr Val Ile Asp Leu Asp Pro Ile Pro Tyr Asp Pro
2390 2395 2400

Lys	Phe	Glu	Lys	Gln	Leu	Gly	Gln	Val	Met	Leu	Leu	Val	Leu	Cys
2405						2410					2415			
Val	Thr	Gln	Val	Leu	Met	Met	Arg	Thr	Thr	Trp	Ala	Leu	Cys	Glu
2420						2425					2430			
Ala	Leu	Thr	Leu	Ala	Thr	Gly	Pro	Ile	Ser	Thr	Leu	Trp	Glu	Gly
2435						2440					2445			
Asn	Pro	Gly	Arg	Phe	Trp	Asn	Thr	Thr	Ile	Ala	Val	Ser	Met	Ala
2450						2455					2460			
Asn	Ile	Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Gly	Leu	Leu	Phe
2465						2470					2475			
Ser	Ile	Met	Lys	Asn	Thr	Thr	Asn	Thr	Arg	Arg	Gly	Thr	Gly	Asn
2480						2485					2490			
Ile	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Ser	Arg	Leu	Asn	Ala
2495						2500					2505			
Leu	Gly	Lys	Ser	Glu	Phe	Gln	Ile	Tyr	Lys	Lys	Ser	Gly	Ile	Gln
2510						2515					2520			
Glu	Val	Asp	Arg	Thr	Leu	Ala	Lys	Glu	Gly	Ile	Lys	Arg	Gly	Glu
2525						2530					2535			
Thr	Asp	His	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Arg	Trp
2540						2545					2550			
Phe	Val	Glu	Arg	Asn	Met	Val	Thr	Pro	Glu	Gly	Lys	Val	Val	Asp
2555						2560					2565			
Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Cys	Gly	Gly	Leu
2570						2575					2580			
Lys	Asn	Val	Arg	Glu	Val	Lys	Gly	Leu	Thr	Lys	Gly	Gly	Pro	Gly
2585						2590					2595			
His	Glu	Glu	Pro	Ile	Pro	Met	Ser	Thr	Tyr	Gly	Trp	Asn	Leu	Val
2600						2605					2610			

Arg Leu Gln Ser Gly Val Asp Val Phe Phe Ile Pro Pro Glu Lys
2615 2620 2625

Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Pro Asn Pro
2630 2635 2640

Thr Val Glu Ala Gly Arg Thr Leu Arg Val Leu Asn Leu Val Glu
2645 2650 2655

Asn Trp Leu Asn Asn Asn Thr Gln Phe Cys Ile Lys Val Leu Asn
2660 2665 2670

Pro Tyr Met Pro Ser Val Ile Glu Lys Met Glu Ala Leu Gln Arg
2675 2680 2685

Lys Tyr Gly Gly Ala Leu Val Arg Asn Pro Leu Ser Arg Asn Ser
2690 2695 2700

Thr His Glu Met Tyr Trp Val Ser Asn Ala Ser Gly Asn Ile Val
2705 2710 2715

Ser Ser Val Asn Met Ile Ser Arg Met Leu Ile Asn Arg Phe Thr
2720 2725 2730

Met Arg Tyr Lys Lys Ala Thr Tyr Glu Pro Asp Val Asp Leu Gly
2735 2740 2745

Ser Gly Thr Arg Asn Ile Gly Ile Glu Ser Glu Ile Pro Asn Leu
2750 2755 2760

Asp Ile Ile Gly Lys Arg Ile Glu Lys Ile Lys Gln Glu His Glu
2765 2770 2775

Thr Ser Trp His Tyr Asp Gln Asp His Pro Tyr Lys Thr Trp Ala
2780 2785 2790

Tyr His Gly Ser Tyr Glu Thr Lys Gln Thr Gly Ser Ala Ser Ser
2795 2800 2805

Met Val Asn Gly Val Val Arg Leu Leu Thr Lys Pro Trp Asp Val
2810 2815 2820

Val Pro Met Val Thr Gln Met Ala Met Thr Asp Thr Thr Pro Phe
2825 2830 2835

Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg Thr Gln
2840 2845 2850

Glu Pro Lys Glu Gly Thr Lys Lys Leu Met Lys Ile Thr Ala Glu
2855 2860 2865

Trp Leu Trp Lys Glu Leu Gly Lys Lys Lys Thr Pro Arg Met Cys
2870 2875 2880

Thr Arg Glu Glu Phe Thr Arg Lys Val Arg Ser Asn Ala Ala Leu
2885 2890 2895

Gly Ala Ile Phe Thr Asp Glu Asn Lys Trp Lys Ser Ala Arg Glu
2900 2905 2910

Ala Val Glu Asp Ser Arg Phe Trp Glu Leu Val Asp Lys Glu Arg
2915 2920 2925

Asn Leu His Leu Glu Gly Lys Cys Glu Thr Cys Val Tyr Asn Met
2930 2935 2940

Met Gly Lys Arg Glu Lys Lys Leu Gly Glu Phe Gly Lys Ala Lys
2945 2950 2955

Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg Phe Leu
2960 2965 2970

Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp Phe Ser
2975 2980 2985

Arg Glu Asn Ser Leu Ser Gly Val Glu Gly Glu Gly Leu His Lys
2990 2995 3000

Leu Gly Tyr Ile Leu Arg Asp Val Ser Lys Lys Glu Gly Gly Ala
3005 3010 3015

Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile Thr Leu
3020 3025 3030

Glu Asp Leu Lys Asn Glu Glu Met Val Thr Asn His Met Glu Gly
3035 3040 3045

Glu His Lys Lys Leu Ala Glu Ala Ile Phe Lys Leu Thr Tyr Gln
3050 3055 3060

Asn Lys Val Val Arg Val Gln Arg Pro Thr Pro Arg Gly Thr Val
3065 3070 3075

Met Asp Ile Ile Ser Arg Arg Asp Gln Arg Gly Ser Gly Gln Val
3080 3085 3090

Gly Thr Tyr Gly Leu Asn Thr Phe Thr Asn Met Glu Ala Gln Leu
3095 3100 3105

Ile Arg Gln Met Glu Gly Glu Gly Val Phe Lys Ser Ile Gln His
3110 3115 3120

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Ile Leu Lys Arg Trp Gly Thr Ile Lys Lys Ser Lys Ala Ile Asn Val
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Arg Arg Arg Ser Ser Ala Gly Met Ile Ile Met Leu Ile Pro Thr Val
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Ala Gly Ala Thr Glu Val Asp Ser Gly Asp Gly Asn His Met Phe Ala
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Gly His Leu Lys Cys Lys Val Arg Met Glu Lys Leu Arg Ile Lys Gly
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Met Ser Tyr Thr Met Cys Ser Gly Lys Phe Ser Ile Asp Lys Glu Met
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Ala Glu Thr Gln His Gly Thr Thr Val Val Lys Val Lys Tyr Glu Gly
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Ala Gly Ala Pro Cys Lys Val Pro Ile Glu Ile Arg Asp Val Asn Lys
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Glu Lys Val Val Gly Arg Ile Ile Ser Ser Thr Pro Leu Ala Glu Asn
625 630 635 640

Thr Asn Ser Val Thr Asn Ile Glu Leu Glu Pro Pro Phe Gly Asp Ser
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Tyr Ile Val Ile Gly Val Gly Asn Ser Ala Leu Thr Leu His Trp Phe
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Arg Lys Gly Ser Ser Ile Gly Lys Met Phe Glu Ser Thr Tyr Arg Gly
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Ala Lys Arg Met Ala Ile Leu Gly Glu Thr Ala Trp Asp Phe Gly Ser
690 695 700

Val Gly Gly Leu Phe Thr Ser Leu Gly Lys Ala Val His Gln Val Phe
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Gly Ser Val Tyr Thr Thr Leu Phe Gly Gly Val Ser Trp Met Ile Arg
725 730 735

Ile Leu Ile Gly Phe Leu Val Leu Trp Ile Gly Thr Asn Ser Arg Asn
740 745 750

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

Leu Gly Val Met Val Gln Ala Asp Ser Gly Cys Val Val Ser Trp Lys
770 775 780

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

His Thr Trp Thr Glu Gln Tyr Lys Phe Gln Pro Glu Ser Pro Ser Lys
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Leu Ala Ser Ala Ile Gln Lys Ala His Glu Glu Asp Ile Cys Gly Ile
820 825 830

Arg Ser Val Thr Arg Leu Glu Asn Leu Met Trp Lys Gln Ile Thr Pro
835 840 845

Glu Leu Asn His Ile Leu Ser Glu Asn Glu Val Lys Leu Thr Ile Met
850 855 860

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

Pro Gln Pro Thr Glu Leu Lys Tyr Ser Trp Lys Thr Trp Gly Lys Ala
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Lys Met Leu Ser Thr Glu Ser His Asn Gln Thr Phe Leu Ile Asp Gly
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Pro Glu Thr Ala Glu Cys Pro Asn Thr Asn Arg Ala Trp Asn Ser Leu
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Glu Val Glu Asp Tyr Gly Phe Gly Val Phe Thr Thr Asn Ile Trp Leu
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Lys Leu Lys Glu Lys Gln Asp Val Phe Cys Asp Ser Lys Leu Met Ser
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Ile Glu Val Lys Asn Cys His Trp Pro Lys Ser His Thr Leu Trp Ser
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Asn Gly Val Leu Glu Ser Glu Met Ile Ile Pro Lys Asn Leu Ala
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Gly Pro Val Ser Gln His Asn Tyr Arg Pro Gly Tyr His Thr Gln
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Phe Cys Asp Gly Thr Thr Val Val Val Thr Glu Asp Cys Gly Asn
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Arg Gly Pro Ser Leu Arg Thr Thr Thr Ala Ser Gly Lys Leu Ile
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His	Gly	Gln	Val	Asp	Asn	Phe	Ser	Leu	Gly	Val	Leu	Gly	Met	Ala
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Thr Ile Lys Gly Leu Asn Pro Thr Ala Ile Phe Leu Thr Thr Leu
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Ser Arg Thr Ser Lys Lys Arg Ser Trp Pro Leu Asn Glu Ala Ile
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Met Ala Val Gly Met Val Ser Ile Leu Ala Ser Ser Leu Leu Lys
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Thr Ser Gly Ser Pro Ile Ile Asp Lys Lys Gly Lys Val Val Gly
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Leu Tyr Gly Asn Gly Val Val Thr Arg Ser Gly Ala Tyr Val Ser
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Ala Ile Ala Gln Thr Glu Lys Ser Ile Glu Asp Asn Pro Glu Ile
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Glu Asp Asp Ile Phe Arg Lys Arg Arg Leu Thr Ile Met Asp Leu
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His Pro Gly Ala Gly Lys Thr Lys Arg Tyr Leu Pro Ala Ile Val
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Arg Glu Ala Ile Lys Arg Gly Leu Arg Thr Leu Ile Leu Ala Pro
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Pro Ile Arg Tyr Gln Thr Pro Ala Ile Arg Ala Val His Thr Gly
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Asp Glu Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly
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Tyr Ile Ser Thr Arg Val Glu Met Gly Glu Ala Ala Gly Ile Phe
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Met Thr Ala Thr Pro Pro Gly Ser Arg Asp Pro Phe Pro Gln Ser
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Asn Ala Pro Ile Ile Asp Glu Glu Arg Glu Ile Pro Glu Arg Ser
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Trp Asn Ser Gly His Glu Trp Val Thr Asp Phe Lys Gly Lys Thr
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Val Trp Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Ala
1835 1840 1845

Cys Leu Arg Lys Asn Gly Lys Lys Val Ile Gln Leu Ser Arg Lys
1850 1855 1860

Thr Phe Asp Ser Glu Tyr Val Lys Thr Arg Thr Asn Asp Trp Asp
1865 1870 1875

Phe Val Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys
1880 1885 1890

Ala Glu Arg Val Ile Asp Pro Arg Arg Cys Met Lys Pro Val Ile
1895 1900 1905

Leu Thr Asp Gly Glu Glu Arg Val Ile Leu Ala Gly Pro Met Pro
1910 1915 1920

Val Thr His Ser Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg
1925 1930 1935

Asn Pro Lys Asn Glu Asn Asp Gln Tyr Ile Tyr Met Gly Glu Pro
1940 1945 1950

Leu Glu Asn Asp Glu Asp Cys Ala His Trp Lys Glu Ala Lys Met
1955 1960 1965

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

Ala Phe Ile Ala Phe Leu Arg Phe Leu Ala Ile Pro Pro Thr Ala Gly
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Ile Leu Ala Arg Trp Gly Ser Phe Lys Lys Asn Gly Ala Ile Lys Val
 65 70 75 80

Leu Arg Gly Phe Lys Arg Glu Ile Ser Asn Met Leu Asn Ile Met Asn
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Arg Arg Lys Arg Ser Val Thr Met Leu Leu Met Leu Leu Pro Thr Ala
 100 105 110

Leu Ala Phe His Leu Thr Thr Arg Gly Gly Glu Pro His Met Ile Val
 115 120 125

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Glu Val Glu Asp Tyr Gly Phe Gly Ile Phe Thr Thr Asn Ile Trp Leu
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Pro	Leu	Asn	Asn	Asp	Glu	Asp	His	Ala	His	Trp	Thr	Glu	Ala	Lys
1955						1960					1965			
Met	Leu	Leu	Asp	Asn	Ile	Asn	Thr	Pro	Glu	Gly	Ile	Ile	Pro	Ala
1970						1975					1980			
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1985						1990					1995			
Tyr	Arg	Leu	Arg	Gly	Glu	Ala	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met
2000						2005					2010			
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Thr Lys Glu Gly Glu Arg Lys Lys Leu Arg Pro Arg Trp Leu Asp
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Ala Arg Thr Tyr Ser Asp Pro Leu Ala Leu Arg Glu Phe Lys Glu
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Phe Ala Ala Gly Arg Arg Ser Val Ser Gly Asp Leu Ile Leu Glu
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Leu Phe Phe Leu Ser Gly Arg Gly Leu Gly Lys Thr Ser Ile Gly
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<212> PRT
<213> dengue virus

<400> 12

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20 25 30

Phe Ser Leu Gly Met Leu Gln Gly Arg Gly Pro Leu Lys Leu Phe Met
35 40 45

Ala Leu Val Ala Phe Leu Arg Phe Leu Thr Ile Pro Pro Thr Ala Gly
50 55 60

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

Leu Arg Gly Phe Arg Lys Glu Ile Gly Arg Met Leu Asn Ile Leu Asn
85 90 95

Arg Arg Arg Arg Ser Ala Gly Met Ile Ile Met Leu Ile Pro Thr Val
100 105 110

Met Ala Phe His Leu Thr Thr Arg Asn Gly Glu Pro His Met Ile Val
115 120 125

Ser Arg Gln Glu Lys Gly Lys Ser Leu Leu Phe Lys Thr Glu Asp Gly
130 135 140

Val Asn Met Cys Thr Leu Met Ala Met Asp Leu Gly Glu Leu Cys Glu
145 150 155 160

Asp Thr Ile Thr Tyr Lys Cys Pro Leu Leu Arg Gln Asn Glu Pro Glu
165 170 175

Asp Ile Asp Cys Trp Cys Asn Ser Thr Ser Thr Trp Val Thr Tyr Gly
180 185 190

Thr Cys Thr Thr Met Gly Glu His Arg Arg Glu Lys Arg Ser Val Ala
195 200 205

Leu Val Pro His Val Gly Met Gly Leu Glu Thr Arg Thr Glu Thr Trp
210 215 220

Met Ser Ser Glu Gly Ala Trp Lys His Val Gln Arg Ile Glu Thr Trp
225 230 235 240

Ile Leu Arg His Pro Gly Phe Thr Met Met Ala Ala Ile Leu Ala Tyr
245 250 255

Thr Ile Gly Thr Thr His Phe Gln Arg Ala Leu Ile Phe Ile Leu Leu
260 265 270

Thr Ala Val Thr Pro Ser Met Thr Met Arg Cys Ile Gly Met Ser Asn
275 280 285

Arg Asp Phe Val Glu Gly Val Ser Gly Gly Ser Trp Val Asp Ile Val
290 295 300

Leu Glu His Gly Ser Cys Val Thr Thr Met Ala Lys Asn Lys Pro Thr
305 310 315 320

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

Arg Lys Tyr Cys Ile Glu Ala Lys Leu Thr Asn Thr Thr Thr Glu Ser
340 345 350

Arg Cys Pro Thr Gln Gly Glu Pro Ser Leu Asn Glu Glu Gln Asp Lys
355 360 365

Arg Phe Val Cys Lys His Ser Met Val Asp Arg Gly Trp Gly Asn Gly
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Cys Gly Leu Phe Gly Lys Gly Gly Ile Val Thr Cys Ala Met Phe Arg
385 390 395 400

Cys Lys Lys Asn Met Glu Gly Lys Val Val Gln Pro Glu Asn Leu Glu
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Tyr Thr Ile Val Ile Thr Pro His Ser Gly Glu Glu His Ala Val Gly
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Asn Asp Thr Gly Lys His Gly Lys Glu Ile Lys Ile Thr Pro Gln Ser
435 440 445

Ser Ile Thr Glu Ala Glu Leu Thr Gly Tyr Gly Thr Val Thr Met Glu
450 455 460

Cys Ser Pro Arg Thr Gly Leu Asp Phe Asn Glu Met Val Leu Leu Gln
465 470 475 480

Met Glu Asn Lys Ala Trp Leu Val His Arg Gln Trp Phe Leu Asp Leu
485 490 495

Pro Leu Pro Trp Leu Pro Gly Ala Asp Thr Gln Gly Ser Asn Trp Ile
500 505 510

Gln Lys Glu Thr Leu Val Thr Phe Lys Asn Pro His Ala Lys Lys Gln
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Asp Val Val Val Leu Gly Ser Gln Glu Gly Ala Met His Thr Ala Leu
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Thr Gly Ala Thr Glu Ile Gln Met Ser Ser Gly Asn Leu Leu Phe Thr
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Gly His Leu Lys Cys Arg Leu Arg Met Asp Lys Leu Gln Leu Lys Gly
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Met Ser Tyr Ser Met Cys Thr Gly Lys Phe Lys Val Val Lys Glu Ile
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Ala Glu Thr Gln His Gly Thr Ile Val Ile Arg Val Gln Tyr Glu Gly
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Asp Gly Ser Pro Cys Lys Ile Pro Phe Glu Ile Met Asp Leu Glu Lys
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Arg His Val Leu Gly Arg Leu Ile Thr Val Asn Pro Ile Val Thr Glu
625 630 635 640

Lys Asp Ser Pro Val Asn Ile Glu Ala Glu Pro Pro Phe Gly Asp Ser
645 650 655

Tyr Ile Ile Ile Gly Val Glu Pro Gly Gln Leu Lys Leu Asn Trp Phe
660 665 670

Lys Lys Gly Ser Ser Ile Gly Gln Met Phe Glu Thr Thr Met Arg Gly
675 680 685

Ala Lys Arg Met Ala Ile Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser
690 695 700

Leu Gly Gly Val Phe Thr Ser Ile Gly Lys Ala Leu His Gln Val Phe
705 710 715 720

Gly Ala Ile Tyr Gly Ala Ala Phe Ser Gly Val Ser Trp Thr Met Lys
725 730 735

Ile Leu Ile Gly Val Ile Ile Thr Trp Ile Gly Met Asn Ser Arg Ser
740 745 750

Thr Ser Leu Ser Val Thr Leu Val Leu Val Gly Ile Val Thr Leu Tyr
755 760 765

Leu Gly Val Met Val Gln Ala Asp Ser Gly Cys Val Val Ser Trp Lys
770 775 780

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

His Thr Trp Thr Glu Gln Tyr Lys Phe Gln Pro Glu Ser Pro Ser Lys
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Leu Ala Ser Ala Ile Gln Lys Ala His Glu Glu Gly Ile Cys Gly Ile
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Arg Ser Val Thr Arg Leu Glu Asn Leu Met Trp Lys Gln Ile Thr Pro
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Glu Leu Asn His Ile Leu Ser Glu Asn Glu Val Lys Leu Thr Ile Met
850 855 860

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

Pro Gln Pro Thr Glu Leu Lys Tyr Ser Trp Lys Thr Trp Gly Lys Ala
885 890 895

Lys Met Leu Ser Thr Glu Ser His Asn Gln Thr Phe Leu Ile Asp Gly
900 905 910

Pro Glu Thr Ala Glu Cys Pro Asn Thr Asn Arg Ala Trp Asn Ser Leu
915 920 925

Glu Val Glu Asp Tyr Gly Phe Gly Val Phe Thr Thr Asn Ile Trp Leu
930 935 940

Lys Leu Lys Glu Lys Gln Asp Val Phe Cys Asp Ser Lys Leu Met Ser
945 950 955 960

Ala Ala Ile Lys Asp Asn Arg Ala Val His Ala Asp Met Gly Tyr Trp
965 970 975

Ile Glu Ser Ala Leu Asn Asp Thr Trp Lys Ile Glu Lys Ala Ser Phe
980 985 990

Ile Glu Val Lys Asn Cys His Trp Pro Lys Ser His Thr Leu Trp Ser
995 1000 1005

Asn Gly Val Leu Glu Ser Glu Met Ile Ile Pro Lys Asn Leu Ala
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Gly Pro Val Ser Gln His Asn Tyr Arg Pro Gly Tyr His Thr Gln
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Ile Thr Gly Pro Trp His Leu Gly Lys Leu Glu Met Asp Phe Asp
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Phe Cys Asp Gly Thr Thr Val Val Val Thr Glu Asp Cys Gly Asn
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Arg Gly Pro Ser Leu Arg Thr Thr Thr Ala Ser Gly Lys Leu Ile
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Arg Gly Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Leu
1100 1105 1110

Lys Glu Lys Glu Glu Asn Leu Val Asn Ser Leu Val Thr Ala Gly
1115 1120 1125

His Gly Gln Val Asp Asn Phe Ser Leu Gly Val Leu Gly Met Ala
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Leu	Phe	Leu	Glu	Glu	Met	Leu	Arg	Thr	Arg	Val	Gly	Thr	Lys	His
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Ala	Ile	Leu	Leu	Val	Ala	Val	Ser	Phe	Val	Thr	Leu	Ile	Thr	Gly
1160						1165					1170			
Asn	Met	Ser	Phe	Arg	Asp	Leu	Gly	Arg	Val	Met	Val	Met	Val	Gly
1175						1180					1185			
Ala	Thr	Met	Thr	Asp	Asp	Ile	Gly	Met	Gly	Val	Thr	Tyr	Leu	Ala
1190						1195					1200			
Leu	Leu	Ala	Ala	Phe	Lys	Val	Arg	Pro	Thr	Phe	Ala	Ala	Gly	Leu
1205						1210					1215			
Leu	Leu	Arg	Lys	Leu	Thr	Ser	Lys	Glu	Leu	Met	Met	Thr	Thr	Ile
1220						1225					1230			
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1235						1240					1245			
Glu	Leu	Thr	Asp	Ala	Leu	Ala	Leu	Gly	Met	Met	Val	Leu	Lys	Met
1250						1255					1260			
Val	Arg	Asn	Met	Glu	Lys	Tyr	Gln	Leu	Ala	Val	Thr	Ile	Met	Ala
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Ile	Leu	Cys	Val	Pro	Asn	Ala	Val	Ile	Leu	Gln	Asn	Ala	Trp	Lys
1280						1285					1290			
Val	Ser	Cys	Thr	Ile	Leu	Ala	Val	Val	Ser	Val	Ser	Pro	Leu	Leu
1295						1300					1305			
Leu	Thr	Ser	Ser	Gln	Gln	Lys	Thr	Asp	Trp	Ile	Pro	Leu	Ala	Leu
1310						1315					1320			
Thr	Ile	Lys	Gly	Leu	Asn	Pro	Thr	Ala	Ile	Phe	Leu	Thr	Thr	Leu
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Ser	Arg	Thr	Ser	Lys	Lys	Arg	Ser	Trp	Pro	Leu	Asn	Glu	Ala	Ile
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Met Ala Val Gly Met Val Ser Ile Leu Ala Ser Ser Leu Leu Lys
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Asn Asp Ile Pro Met Thr Gly Pro Leu Val Ala Gly Gly Leu Leu
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Thr Val Cys Tyr Val Leu Thr Gly Arg Ser Ala Asp Leu Glu Leu
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Glu Arg Ala Ala Asp Val Lys Trp Glu Asp Gln Ala Glu Ile Ser
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Gly Ser Ser Pro Ile Leu Ser Ile Thr Ile Ser Glu Asp Gly Ser
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Met Ser Ile Lys Asn Glu Glu Glu Glu Gln Thr Leu Thr Ile Leu
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Ile Arg Thr Gly Leu Leu Val Ile Ser Gly Leu Phe Pro Val Ser
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Ile Pro Ile Thr Ala Ala Ala Trp Tyr Leu Trp Glu Val Lys Lys
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Gln Arg Ala Gly Val Leu Trp Asp Val Pro Ser Pro Pro Pro Met
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Gly Lys Ala Glu Leu Glu Asp Gly Ala Tyr Arg Ile Lys Gln Lys
1490 1495 1500

Gly Ile Leu Gly Tyr Ser Gln Ile Gly Ala Gly Val Tyr Lys Glu
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Gly Thr Phe His Thr Met Trp His Val Thr Arg Gly Ala Val Leu
1520 1525 1530

Met His Lys Gly Lys Arg Ile Glu Pro Ser Trp Ala Asp Val Lys
1535 1540 1545

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

Asp Glu Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly
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Tyr Ile Ser Thr Arg Val Glu Met Gly Glu Ala Ala Gly Ile Phe
1775 1780 1785

Met Thr Ala Thr Pro Pro Gly Ser Arg Asp Pro Phe Pro Gln Ser
1790 1795 1800

Asn Ala Pro Ile Ile Asp Glu Glu Arg Glu Ile Pro Glu Arg Ser
1805 1810 1815

Trp Asn Ser Gly His Glu Trp Val Thr Asp Phe Lys Gly Lys Thr
1820 1825 1830

Val Trp Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Ala
1835 1840 1845

Cys Leu Arg Lys Asn Gly Lys Lys Val Ile Gln Leu Ser Arg Lys
1850 1855 1860

Thr Phe Asp Ser Glu Tyr Val Lys Thr Arg Thr Asn Asp Trp Asp
1865 1870 1875

Phe Val Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys
1880 1885 1890

Ala Glu Arg Val Ile Asp Pro Arg Arg Cys Met Lys Pro Val Ile
1895 1900 1905

Leu Thr Asp Gly Glu Glu Arg Val Ile Leu Ala Gly Pro Met Pro
1910 1915 1920

Val Thr His Ser Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg
1925 1930 1935

Asn Pro Lys Asn Glu Asn Asp Gln Tyr Ile Tyr Met Gly Glu Pro
1940 1945 1950

Leu Glu Asn Asp Glu Asp Cys Ala His Trp Lys Glu Ala Lys Met
1955 1960 1965

Leu Leu Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile Pro Ser Met
1970 1975 1980

Phe Glu Pro Glu Arg Glu Lys Val Asp Ala Ile Asp Gly Glu Tyr
1985 1990 1995

Arg Leu Arg Gly Glu Ala Arg Lys Thr Phe Val Asp Leu Met Arg
2000 2005 2010

Arg Gly Asp Leu Pro Val Trp Leu Ala Tyr Arg Val Ala Ala Glu
2015 2020 2025

Gly Ile Asn Tyr Ala Asp Arg Arg Trp Cys Phe Asp Gly Val Lys
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Asn Asn Gln Ile Leu Glu Glu Asn Val Glu Val Glu Ile Trp Thr
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Lys Glu Gly Glu Arg Lys Lys Leu Lys Pro Arg Trp Leu Asp Ala
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Arg Ile Tyr Ser Asp Pro Leu Ala Leu Lys Glu Phe Lys Glu Phe
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Ala Ala Gly Arg Lys Ser Leu Thr Leu Asn Leu Ile Thr Glu Met
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Gly Arg Leu Pro Thr Phe Met Thr Gln Lys Ala Arg Asp Ala Leu
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Asp Asn Leu Ala Val Leu His Thr Ala Glu Ala Gly Gly Arg Ala
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Tyr Asn His Ala Leu Ser Glu Leu Pro Glu Thr Leu Glu Thr Leu
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Leu Leu Leu Thr Leu Leu Ala Thr Val Thr Gly Gly Ile Phe Leu
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Phe Leu Met Ser Gly Arg Gly Ile Gly Lys Met Thr Leu Gly Met
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Cys Cys Ile Ile Thr Ala Ser Ile Leu Leu Trp Tyr Ala Gln Ile
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Gln Pro His Trp Ile Ala Ala Ser Ile Ile Leu Glu Phe Phe Leu
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Ile Val Leu Leu Ile Pro Glu Pro Glu Lys Gln Arg Thr Pro Gln
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Asp Asn Gln Leu Thr Tyr Val Val Ile Ala Ile Leu Thr Val Val
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Ala Ala Thr Met Ala Asn Glu Met Gly Phe Leu Glu Lys Thr Lys
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Lys Asp Leu Gly Leu Gly Ser Ile Ala Thr Gln Gln Pro Glu Ser
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Asn Ile Leu Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Thr Leu
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Tyr Ala Val Ala Thr Thr Phe Val Thr Pro Met Leu Arg His Ser
2285 2290 2295

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2300 2305 2310

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Lys Met Asp Ile Gly Val Pro Leu Leu Ala Ile Gly Cys Tyr Ser
2330 2335 2340

Gln Val Asn Pro Ile Thr Leu Thr Ala Ala Leu Phe Leu Leu Val
2345 2350 2355

Ala His Tyr Ala Ile Ile Gly Pro Gly Leu Gln Ala Lys Ala Thr
2360 2365 2370

Arg Glu Ala Gln Lys Arg Ala Ala Ala Gly Ile Met Lys Asn Pro
2375 2380 2385

Thr Val Asp Gly Ile Thr Val Ile Asp Leu Asp Pro Ile Pro Tyr
2390 2395 2400

Asp Pro Lys Phe Glu Lys Gln Leu Gly Gln Val Met Leu Leu Val
2405 2410 2415

Leu Cys Val Thr Gln Val Leu Met Met Arg Thr Thr Trp Ala Leu
2420 2425 2430

Cys Glu Ala Leu Thr Leu Ala Thr Gly Pro Ile Ser Thr Leu Trp
2435 2440 2445

Glu Gly Asn Pro Gly Arg Phe Trp Asn Thr Thr Ile Ala Val Ser
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Met Ala Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Gly Leu
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Leu Phe Ser Ile Met Lys Asn Thr Thr Asn Thr Arg Arg Gly Thr
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Gly Asn Ile Gly Glu Thr Leu Gly Glu Lys Trp Lys Ser Arg Leu
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Glu Lys Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Pro
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Val Glu Asn Trp Leu Asn Asn Asn Thr Gln Phe Cys Ile Lys Val
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Phe Thr Met Arg Tyr Lys Lys Ala Thr Tyr Glu Pro Asp Val Asp
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Asn Leu Asp Ile Ile Gly Lys Arg Ile Glu Lys Ile Lys Gln Glu
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His Glu Thr Ser Trp His Tyr Asp Gln Asp His Pro Tyr Lys Thr
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Trp Ala Tyr His Gly Ser Tyr Glu Thr Lys Gln Thr Gly Ser Ala
2795 2800 2805

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2975 2980 2985

Phe Ser Arg Glu Asn Ser Leu Ser Gly Val Glu Gly Glu Gly Leu
2990 2995 3000

His Lys Leu Gly Tyr Ile Leu Arg Asp Val Ser Lys Lys Glu Gly
3005 3010 3015

Gly Ala Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
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Thr Leu Glu Asp Leu Lys Asn Glu Glu Met Val Thr Asn His Met
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Glu Gly Glu His Lys Lys Leu Ala Glu Ala Ile Phe Lys Leu Thr
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Tyr Gln Asn Lys Val Val Arg Val Gln Arg Pro Thr Pro Arg Gly
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Gln Leu Ile Arg Gln Met Glu Gly Glu Gly Val Phe Lys Ser Ile
3110 3115 3120

Gln His Leu Thr Ile Thr Glu Glu Ile Ala Val Gln Asn Trp Leu
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Ala Arg Val Gly Arg Glu Arg Leu Ser Arg Met Ala Ile Ser Gly
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Lys Arg Lys Lys Thr Ser Leu Cys Leu Met Met Met Leu Pro Ala Thr
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Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Glu Leu Lys Gly Met Ser
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Tyr Ala Met Cys Leu Ser Ser Phe Val Leu Lys Lys Glu Val Ser Glu
580 585 590

Thr Gln His Gly Thr Ile Leu Ile Lys Val Glu Tyr Lys Gly Glu Asp
595 600 605

Ala Pro Cys Lys Ile Pro Phe Ser Thr Glu Asp Gly Gln Gly Lys Ala
610 615 620

His Asn Gly Arg Leu Ile Thr Ala Asn Pro Val Val Thr Lys Lys Glu
625 630 635 640

Glu Pro Val Asn Ile Glu Ala Glu Pro Pro Phe Gly Glu Ser Asn Ile
645 650 655

Val Ile Gly Ile Gly Asp Lys Ala Leu Lys Ile Asn Trp Tyr Lys Lys
660 665 670

Gly Ser Ser Ile Gly Lys Met Phe Glu Ala Thr Ala Arg Gly Ala Arg
675 680 685

Arg Met Ala Ile Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly
690 695 700

Gly Val Leu Asn Ser Leu Gly Lys Met Val His Gln Ile Phe Gly Ser
705 710 715 720

Ala Tyr Thr Ala Leu Phe Gly Gly Val Ser Trp Met Met Lys Ile Gly
725 730 735

Ile Gly Val Leu Leu Thr Trp Ile Gly Leu Asn Ser Lys Asn Thr Ser
740 745 750

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

Ala Val Val Gln Ala Asp Met Gly Cys Val Ile Asn Trp Lys Gly Lys
770 775 780

Glu Leu Lys Cys Gly Ser Gly Ile Phe Val Thr Asn Glu Val His Thr
785 790 795 800

Trp Thr Glu Gln Tyr Lys Phe Gln Ala Asp Ser Pro Lys Arg Leu Ala
805 810 815

Thr Ala Ile Ala Gly Ala Trp Glu Asn Gly Val Cys Gly Ile Arg Ser
820 825 830

Thr Thr Arg Met Glu Asn Leu Leu Trp Lys Gln Ile Ala Asn Glu Leu
835 840 845

Asn Tyr Ile Leu Trp Glu Asn Asn Ile Lys Leu Thr Val Val Val Gly
850 855 860

Asp Ile Thr Gly Val Leu Glu Gln Gly Lys Arg Thr Leu Thr Pro Gln
865 870 875 880

Pro Met Glu Leu Lys Tyr Ser Trp Lys Thr Trp Gly Lys Ala Lys Ile
885 890 895

Val Thr Ala Glu Thr Gln Asn Ser Ser Phe Ile Ile Asp Gly Pro Ser
900 905 910

Thr Pro Glu Cys Pro Ser Ala Ser Arg Ala Trp Asn Val Trp Glu Val
915 920 925

Glu Asp Tyr Gly Phe Gly Val Phe Thr Thr Asn Ile Trp Leu Lys Leu
930 935 940

Arg Glu Val Tyr Thr Gln Leu Cys Asp His Arg Leu Met Ser Ala Ala
945 950 955 960

Val Lys Asp Glu Arg Ala Val His Ala Asp Met Gly Tyr Trp Ile Glu
965 970 975

Ser Gln Lys Asn Gly Ser Trp Lys Leu Glu Lys Ala Ser Phe Ile Glu
980 985 990

Val Lys Thr Cys Thr Trp Pro Lys Ser His Thr Leu Trp Ser Asn Gly
995 1000 1005

Val Leu Glu Ser Asp Met Ile Ile Pro Lys Ser Leu Ala Gly Pro
1010 1015 1020

Ile Ser Gln His Asn His Arg Pro Gly Tyr His Thr Gln Thr Ala
1025 1030 1035

Gly Pro Trp His Leu Gly Lys Leu Glu Leu Asp Phe Asn Tyr Cys
1040 1045 1050

Glu Gly Thr Thr Val Val Ile Ser Glu Asn Cys Gly Thr Arg Gly
1055 1060 1065

Pro Ser Leu Arg Thr Thr Thr Val Ser Gly Lys Leu Ile His Glu
1070 1075 1080

Trp	Cys	Cys	Arg	Ser	Cys	Thr	Leu	Pro	Pro	Leu	Arg	Tyr	Met	Gly
	1085					1090					1095			
Glu	Asp	Gly	Cys	Trp	Tyr	Gly	Met	Glu	Ile	Arg	Pro	Ile	Asn	Glu
	1100					1105					1110			
Lys	Glu	Glu	Asn	Met	Val	Lys	Ser	Leu	Ala	Ser	Ala	Gly	Ser	Gly
	1115					1120					1125			
Lys	Val	Asp	Asn	Phe	Thr	Met	Gly	Val	Leu	Cys	Leu	Ala	Ile	Leu
	1130					1135					1140			
Phe	Glu	Glu	Val	Met	Arg	Gly	Lys	Phe	Gly	Lys	Lys	His	Met	Ile
	1145					1150					1155			
Ala	Gly	Val	Leu	Phe	Thr	Phe	Val	Leu	Leu	Leu	Ser	Gly	Gln	Ile
	1160					1165					1170			
Thr	Trp	Arg	Asp	Met	Ala	His	Thr	Leu	Ile	Met	Ile	Gly	Ser	Asn
	1175					1180					1185			
Ala	Ser	Asp	Arg	Met	Gly	Met	Gly	Val	Thr	Tyr	Leu	Ala	Leu	Ile
	1190					1195					1200			
Ala	Thr	Phe	Lys	Ile	Gln	Pro	Phe	Leu	Ala	Leu	Gly	Phe	Phe	Leu
	1205					1210					1215			
Arg	Lys	Leu	Thr	Ser	Arg	Glu	Asn	Leu	Leu	Leu	Gly	Val	Gly	Leu
	1220					1225					1230			
Ala	Met	Ala	Ala	Thr	Leu	Arg	Leu	Pro	Glu	Asp	Ile	Glu	Gln	Met
	1235					1240					1245			
Ala	Asn	Gly	Ile	Ala	Leu	Gly	Leu	Met	Ala	Leu	Lys	Leu	Ile	Thr
	1250					1255					1260			
Gln	Phe	Glu	Thr	Tyr	Gln	Leu	Trp	Thr	Ala	Leu	Val	Ser	Leu	Thr
	1265					1270					1275			

Cys	Ser	Asn	Thr	Ile	Phe	Thr	Leu	Thr	Val	Ala	Trp	Arg	Thr	Ala
1280						1285					1290			
Thr	Leu	Ile	Leu	Ala	Gly	Ile	Ser	Leu	Leu	Pro	Val	Cys	Gln	Ser
1295						1300					1305			
Ser	Ser	Met	Arg	Lys	Thr	Asp	Trp	Leu	Pro	Met	Thr	Val	Ala	Ala
1310						1315					1320			
Met	Gly	Ala	Gln	Pro	Leu	Pro	Leu	Phe	Ile	Phe	Ser	Leu	Lys	Asp
1325						1330					1335			
Thr	Leu	Lys	Arg	Arg	Ser	Trp	Pro	Leu	Asn	Glu	Gly	Val	Met	Ala
1340						1345					1350			
Val	Gly	Leu	Val	Ser	Ile	Leu	Ala	Ser	Ser	Leu	Leu	Arg	Asn	Asp
1355						1360					1365			
Val	Pro	Met	Ala	Gly	Pro	Leu	Val	Ala	Gly	Gly	Leu	Leu	Ile	Ala
1370						1375					1380			
Cys	Tyr	Val	Ile	Thr	Gly	Thr	Ser	Ala	Asp	Leu	Thr	Val	Glu	Lys
1385						1390					1395			
Ala	Ala	Asp	Val	Thr	Trp	Glu	Glu	Glu	Ala	Glu	Gln	Thr	Gly	Val
1400						1405					1410			
Ser	His	Asn	Leu	Met	Val	Thr	Val	Asp	Asp	Asp	Gly	Thr	Met	Arg
1415						1420					1425			
Ile	Lys	Asp	Asp	Glu	Thr	Glu	Asn	Ile	Leu	Thr	Val	Leu	Leu	Lys
1430						1435					1440			
Thr	Ala	Leu	Leu	Ile	Val	Ser	Gly	Ile	Phe	Pro	Tyr	Ser	Ile	Pro
1445						1450					1455			
Ala	Thr	Leu	Leu	Val	Trp	His	Thr	Trp	Gln	Lys	Gln	Thr	Gln	Arg
1460						1465					1470			
Ser	Gly	Val	Leu	Trp	Asp	Val	Pro	Ser	Pro	Pro	Glu	Thr	Gln	Lys
1475						1480					1485			

Ala Glu Leu Glu Glu Gly Val Tyr Arg Ile Lys Gln Gln Gly Ile
1490 1495 1500

Phe Gly Lys Thr Gln Val Gly Val Gly Val Gln Lys Glu Gly Val
1505 1510 1515

Phe His Thr Met Trp His Val Thr Arg Gly Ala Val Leu Thr His
1520 1525 1530

Asn Gly Lys Arg Leu Glu Pro Asn Trp Ala Ser Val Lys Lys Asp
1535 1540 1545

Leu Ile Ser Tyr Gly Gly Gly Trp Arg Leu Ser Ala Gln Trp Gln
1550 1555 1560

Lys Gly Glu Glu Val Gln Val Ile Ala Val Glu Pro Gly Lys Asn
1565 1570 1575

Pro Lys Asn Phe Gln Thr Met Pro Gly Ile Phe Gln Thr Thr Thr
1580 1585 1590

Gly Glu Ile Gly Ala Ile Ala Leu Asp Phe Lys Pro Gly Thr Ser
1595 1600 1605

Gly Ser Pro Ile Ile Asn Arg Glu Gly Lys Val Val Gly Leu Tyr
1610 1615 1620

Gly Asn Gly Val Val Thr Lys Asn Gly Gly Tyr Val Ser Gly Ile
1625 1630 1635

Ala Gln Thr Asn Ala Glu Pro Asp Gly Pro Thr Pro Glu Leu Glu
1640 1645 1650

Glu Glu Met Phe Lys Lys Arg Asn Leu Thr Ile Met Asp Leu His
1655 1660 1665

Pro Gly Ser Gly Lys Thr Arg Lys Tyr Leu Pro Ala Ile Val Arg
1670 1675 1680

Glu Ala Ile Lys Arg Arg Leu Arg Thr Leu Ile Leu Ala Pro Thr
1685 1690 1695

Arg Val Val Ala Ala Glu Met Glu Glu Ala Leu Lys Gly Leu Pro
1700 1705 1710

Ile Arg Tyr Gln Thr Thr Ala Thr Lys Ser Glu His Thr Gly Arg
1715 1720 1725

Glu Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Met Arg Leu
1730 1735 1740

Leu Ser Pro Val Arg Val Pro Asn Tyr Asn Leu Ile Ile Met Asp
1745 1750 1755

Glu Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly Tyr
1760 1765 1770

Ile Ser Thr Arg Val Gly Met Gly Glu Ala Ala Ala Ile Phe Met
1775 1780 1785

Thr Ala Thr Pro Pro Gly Thr Ala Asp Ala Phe Pro Gln Ser Asn
1790 1795 1800

Ala Pro Ile Gln Asp Glu Glu Arg Asp Ile Pro Glu Arg Ser Trp
1805 1810 1815

Asn Ser Gly Asn Glu Trp Ile Thr Asp Phe Val Gly Lys Thr Val
1820 1825 1830

Trp Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Asn Cys
1835 1840 1845

Leu Arg Lys Asn Gly Lys Lys Val Ile Gln Leu Ser Arg Lys Thr
1850 1855 1860

Phe Asp Thr Glu Tyr Gln Lys Thr Lys Leu Asn Asp Trp Asp Phe
1865 1870 1875

Val Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala
1880 1885 1890

Asp Arg Val Ile Asp Pro Arg Arg Cys Leu Lys Pro Val Ile Leu
1895 1900 1905

Thr Asp Gly Pro Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val
1910 1915 1920

Thr Val Ala Ser Ala Ala Gln Arg Arg Gly Arg Val Gly Arg Asn
1925 1930 1935

Pro Gln Lys Glu Asn Asp Gln Tyr Ile Phe Met Gly Gln Pro Leu
1940 1945 1950

Asn Asn Asp Glu Asp His Ala His Trp Thr Glu Ala Lys Met Leu
1955 1960 1965

Leu Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile Pro Ala Leu Phe
1970 1975 1980

Glu Pro Glu Arg Glu Lys Ser Ala Ala Ile Asp Gly Glu Tyr Arg
1985 1990 1995

Leu Lys Gly Glu Ser Arg Lys Thr Phe Val Glu Leu Met Arg Arg
2000 2005 2010

Gly Asp Leu Pro Val Trp Leu Ala His Lys Val Ala Ser Glu Gly
2015 2020 2025

Ile Lys Tyr Thr Asp Arg Lys Trp Cys Phe Asp Gly Glu Arg Asn
2030 2035 2040

Asn Gln Ile Leu Glu Glu Asn Met Asp Val Glu Ile Trp Thr Lys
2045 2050 2055

Glu Gly Glu Lys Lys Lys Leu Arg Pro Arg Trp Leu Asp Ala Arg
2060 2065 2070

Thr Tyr Ser Asp Pro Leu Ala Leu Lys Glu Phe Lys Asp Phe Ala
2075 2080 2085

Ala	Gly	Arg	Lys	Ser	Ile	Ala	Leu	Asp	Leu	Val	Thr	Glu	Ile	Gly
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Arg	Val	Pro	Ser	His	Leu	Ala	His	Arg	Thr	Arg	Asn	Ala	Leu	Asp
2105						2110					2115			
Asn	Leu	Val	Met	Leu	His	Thr	Ser	Glu	His	Gly	Gly	Arg	Ala	Tyr
2120						2125					2130			
Arg	His	Ala	Val	Glu	Glu	Leu	Pro	Glu	Thr	Met	Glu	Thr	Leu	Leu
2135						2140					2145			
Leu	Leu	Gly	Leu	Met	Ile	Leu	Leu	Thr	Gly	Gly	Ala	Met	Leu	Phe
2150						2155					2160			
Leu	Ile	Ser	Gly	Lys	Gly	Ile	Gly	Lys	Thr	Ser	Ile	Gly	Leu	Ile
2165						2170					2175			
Cys	Val	Ile	Ala	Ser	Ser	Gly	Met	Leu	Trp	Met	Ala	Asp	Val	Pro
2180						2185					2190			
Leu	Gln	Trp	Ile	Ala	Ser	Ala	Ile	Val	Leu	Glu	Phe	Phe	Met	Met
2195						2200					2205			
Val	Leu	Leu	Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Thr	Pro	Gln	Asp
2210						2215					2220			
Asn	Gln	Leu	Ala	Tyr	Val	Val	Ile	Gly	Ile	Leu	Thr	Leu	Ala	Ala
2225						2230					2235			
Ile	Val	Ala	Ala	Asn	Glu	Met	Gly	Leu	Leu	Glu	Thr	Thr	Lys	Arg
2240						2245					2250			
Asp	Leu	Gly	Met	Ser	Lys	Glu	Pro	Gly	Val	Val	Ser	Pro	Thr	Ser
2255						2260					2265			
Tyr	Leu	Asp	Val	Asp	Leu	His	Pro	Ala	Ser	Ala	Trp	Thr	Leu	Tyr
2270						2275					2280			
Ala	Val	Ala	Thr	Thr	Val	Ile	Thr	Pro	Met	Leu	Arg	His	Thr	Ile
2285						2290					2295			

Glu Asn Ser Thr Ala Asn Val Ser Leu Ala Ala Ile Ala Asn Gln
2300 2305 2310

Ala Val Val Leu Met Gly Leu Asp Lys Gly Trp Pro Ile Ser Lys
2315 2320 2325

Met Asp Leu Gly Val Pro Leu Leu Ala Leu Gly Cys Tyr Ser Gln
2330 2335 2340

Val Asn Pro Leu Thr Leu Ala Ala Ala Val Leu Leu Leu Val Thr
2345 2350 2355

His Tyr Ala Ile Ile Gly Pro Gly Leu Gln Ala Lys Ala Thr Arg
2360 2365 2370

Glu Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Thr
2375 2380 2385

Val Asp Gly Ile Met Thr Ile Asp Leu Asp Pro Val Ile Tyr Asp
2390 2395 2400

Ser Lys Phe Glu Lys Gln Leu Gly Gln Val Met Leu Leu Val Leu
2405 2410 2415

Cys Ala Val Gln Leu Leu Leu Met Arg Thr Ser Trp Ala Leu Cys
2420 2425 2430

Glu Val Leu Thr Leu Ala Thr Gly Pro Ile Thr Thr Leu Trp Glu
2435 2440 2445

Gly Ser Pro Gly Lys Phe Trp Asn Thr Thr Ile Ala Val Ser Met
2450 2455 2460

Ala Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Gly Leu Ala
2465 2470 2475

Phe Ser Ile Met Lys Ser Val Gly Thr Gly Lys Arg Gly Thr Gly
2480 2485 2490

Ser	Gln	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Lys	Lys	Leu	Asn
	2495					2500					2505			
Gln	Leu	Ser	Arg	Lys	Glu	Phe	Asp	Leu	Tyr	Lys	Lys	Ser	Gly	Ile
	2510					2515					2520			
Thr	Glu	Val	Asp	Arg	Thr	Glu	Ala	Lys	Glu	Gly	Leu	Lys	Arg	Gly
	2525					2530					2535			
Glu	Ile	Thr	His	His	Ala	Val	Ser	Arg	Gly	Ser	Ala	Lys	Leu	Gln
	2540					2545					2550			
Trp	Phe	Val	Glu	Arg	Asn	Met	Val	Ile	Pro	Glu	Gly	Arg	Val	Ile
	2555					2560					2565			
Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Cys	Ala	Gly
	2570					2575					2580			
Leu	Lys	Lys	Val	Thr	Glu	Val	Arg	Gly	Tyr	Thr	Lys	Gly	Gly	Pro
	2585					2590					2595			
Gly	His	Glu	Glu	Pro	Val	Pro	Met	Ser	Thr	Tyr	Gly	Trp	Asn	Ile
	2600					2605					2610			
Val	Lys	Leu	Met	Ser	Gly	Lys	Asp	Val	Phe	Tyr	Leu	Pro	Pro	Glu
	2615					2620					2625			
Lys	Cys	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Pro	Ser
	2630					2635					2640			
Pro	Thr	Val	Glu	Glu	Ser	Arg	Thr	Ile	Arg	Val	Leu	Lys	Met	Val
	2645					2650					2655			
Glu	Pro	Trp	Leu	Lys	Asn	Asn	Gln	Phe	Cys	Ile	Lys	Val	Leu	Asn
	2660					2665					2670			
Pro	Tyr	Met	Pro	Thr	Val	Ile	Glu	His	Leu	Glu	Arg	Leu	Gln	Arg
	2675					2680					2685			
Lys	His	Gly	Gly	Met	Leu	Val	Arg	Asn	Pro	Leu	Ser	Arg	Asn	Ser
	2690					2695					2700			

Thr His Glu Met Tyr Trp Ile Ser Asn Gly Thr Gly Asn Ile Val
2705 2710 2715

Ser Ser Val Asn Met Val Ser Arg Leu Leu Leu Asn Arg Phe Thr
2720 2725 2730

Met Thr His Arg Arg Pro Thr Ile Glu Lys Asp Val Asp Leu Gly
2735 2740 2745

Ala Gly Thr Arg His Val Asn Ala Glu Pro Glu Thr Pro Asn Met
2750 2755 2760

Asp Val Ile Gly Glu Arg Ile Lys Arg Ile Lys Glu Glu His Ser
2765 2770 2775

Ser Thr Trp His Tyr Asp Asp Glu Asn Pro Tyr Lys Thr Trp Ala
2780 2785 2790

Tyr His Gly Ser Tyr Glu Val Lys Ala Thr Gly Ser Ala Ser Ser
2795 2800 2805

Met Ile Asn Gly Val Val Lys Leu Leu Thr Lys Pro Trp Asp Val
2810 2815 2820

Val Pro Met Val Thr Gln Met Ala Met Thr Asp Thr Thr Pro Phe
2825 2830 2835

Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg Thr Pro
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Arg Pro Met Pro Gly Thr Arg Lys Val Met Glu Ile Thr Ala Glu
2855 2860 2865

Trp Leu Trp Arg Thr Leu Gly Arg Asn Lys Arg Pro Arg Leu Cys
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Thr Arg Glu Glu Phe Thr Lys Lys Val Arg Thr Asn Ala Ala Met
2885 2890 2895

Gly Ala Val Phe Thr Glu Glu Asn Gln Trp Asp Ser Ala Arg Ala
2900 2905 2910

Ala Val Glu Asp Glu Glu Phe Trp Lys Leu Val Asp Arg Glu Arg
2915 2920 2925

Glu Leu His Lys Leu Gly Lys Cys Gly Ser Cys Val Tyr Asn Met
2930 2935 2940

Met Gly Lys Arg Glu Lys Lys Leu Gly Glu Phe Gly Lys Ala Lys
2945 2950 2955

Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg Tyr Leu
2960 2965 2970

Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp Phe Ser
2975 2980 2985

Arg Glu Asn Ser Tyr Ser Gly Val Glu Gly Glu Gly Leu His Lys
2990 2995 3000

Leu Gly Tyr Ile Leu Arg Asp Ile Ser Lys Ile Pro Gly Gly Ala
3005 3010 3015

Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile Thr Glu
3020 3025 3030

Asp Asp Leu His Asn Glu Glu Lys Ile Thr Gln Gln Met Asp Pro
3035 3040 3045

Glu His Arg Gln Leu Ala Asn Ala Ile Phe Lys Leu Thr Tyr Gln
3050 3055 3060

Asn Lys Val Val Lys Val Gln Arg Pro Thr Pro Lys Gly Thr Val
3065 3070 3075

Met Asp Ile Ile Ser Arg Lys Asp Gln Arg Gly Ser Gly Gln Val
3080 3085 3090

Gly Thr Tyr Gly Leu Asn Thr Phe Thr Asn Met Glu Ala Gln Leu
3095 3100 3105

Ile Arg Gln Met Glu Gly Glu Gly Val Leu Ser Lys Ala Asp Leu
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Glu Asn Pro His Pro Leu Glu Lys Lys Ile Thr Gln Trp Leu Glu
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Thr Lys Gly Val Glu Arg Leu Lys Arg Met Ala Ile Ser Gly Asp
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Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala Asn Ala Leu
3155 3160 3165

Leu Ala Leu Asn Asp Met Gly Lys Val Arg Lys Asp Ile Pro Gln
3170 3175 3180

Trp Gln Pro Ser Lys Gly Trp His Asp Trp Gln Gln Val Pro Phe
3185 3190 3195

Cys Ser His His Phe His Glu Leu Ile Met Lys Asp Gly Arg Lys
3200 3205 3210

Leu Val Val Pro Cys Arg Pro Gln Asp Glu Leu Ile Gly Arg Ala
3215 3220 3225

Arg Ile Ser Gln Gly Ala Gly Trp Ser Leu Arg Glu Thr Ala Cys
3230 3235 3240

Leu Gly Lys Ala Tyr Ala Gln Met Trp Ala Leu Met Tyr Phe His
3245 3250 3255

Arg Arg Asp Leu Arg Leu Ala Ser Asn Ala Ile Cys Ser Ala Val
3260 3265 3270

Pro Val His Trp Val Pro Thr Ser Arg Thr Thr Trp Ser Ile His
3275 3280 3285

Ala His His Gln Trp Met Thr Thr Glu Asp Met Leu Thr Val Trp
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Asn Arg Val Trp Ile Glu Asp Asn Pro Trp Met Glu Asp Lys Thr
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Pro Val Thr Thr Trp Glu Asp Val Pro Tyr Leu Gly Lys Arg Glu
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Asp Gln Trp Cys Gly Ser Leu Ile Gly Leu Thr Ser Arg Ala Thr
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Trp Ala Gln Asn Ile Leu Thr Ala Ile Gln Gln Val Arg Ser Leu
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Ile Gly Asn Glu Glu Phe Leu Asp Tyr Met Pro Ser Met Lys Arg
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Phe Arg Lys Glu Glu Glu Ser Glu Gly Ala Ile Trp
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 tggtagacc acctttcaat atgctgaaac gcgagagaaa ccgcgtatca acccctcaag 180
 ggttggtgaa gagatttca accggacttt tttctgggaa aggaccctta cggatggtgc 240
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Leu Lys Arg Trp Gly Gln Leu Lys Lys Asn Lys Ala Ile Arg Ile Leu
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Arg Lys Arg Ser Thr Ile Thr Leu Leu Cys Leu Ile Pro Thr Val Met
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Thr Pro His Ser Gly Met Gly Leu Glu Thr Arg Ala Glu Thr Trp Met
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Ser Ile Arg Asp Val Glu Glu Thr Asn Met Ile Thr Leu Leu Val
1430 1435 1440

Lys Leu Ala Leu Ile Thr Val Ser Gly Leu Tyr Pro Leu Ala Ile
1445 1450 1455

Pro Val Thr Met Thr Leu Trp Tyr Met Trp Gln Val Lys Thr Gln
1460 1465 1470

Arg Ser Gly Ala Leu Trp Asp Val Pro Ser Pro Ala Ala Thr Gln
1475 1480 1485

Lys Ala Ala Leu Ser Glu Gly Val Tyr Arg Ile Met Gln Arg Gly
1490 1495 1500

Leu Phe Gly Lys Thr Gln Val Gly Val Gly Ile His Met Glu Gly
1505 1510 1515

Val Phe His Thr Met Trp His Val Thr Arg Gly Ser Val Ile Cys
1520 1525 1530

His Glu Thr Gly Arg Leu Glu Pro Ser Trp Ala Asp Val Arg Asn
1535 1540 1545

Asp Met Ile Ser Tyr Gly Gly Gly Trp Arg Leu Gly Asp Lys Trp
1550 1555 1560

Asp Lys Glu Glu Asp Val Gln Val Leu Ala Ile Glu Pro Gly Lys
1565 1570 1575

Asn Pro Lys His Val Gln Thr Lys Pro Gly Leu Phe Lys Thr Leu
1580 1585 1590

Thr Gly Glu Ile Gly Ala Val Thr Leu Asp Phe Lys Pro Gly Thr
1595 1600 1605

Ser Gly Ser Pro Ile Ile Asn Arg Lys Gly Lys Val Ile Gly Leu
1610 1615 1620

Tyr	Gly	Asn	Gly	Val	Val	Thr	Lys	Ser	Gly	Asp	Tyr	Val	Ser	Ala
1625						1630					1635			
Ile	Thr	Gln	Ala	Glu	Arg	Ile	Gly	Glu	Pro	Asp	Tyr	Glu	Val	Asp
1640						1645					1650			
Glu	Asp	Ile	Phe	Arg	Lys	Lys	Arg	Leu	Thr	Ile	Met	Asp	Leu	His
1655						1660					1665			
Pro	Gly	Ala	Gly	Lys	Thr	Lys	Arg	Ile	Leu	Pro	Ser	Ile	Val	Arg
1670						1675					1680			
Glu	Ala	Leu	Lys	Arg	Arg	Leu	Arg	Thr	Leu	Ile	Leu	Ala	Pro	Thr
1685						1690					1695			
Arg	Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	Pro
1700						1705					1710			
Ile	Arg	Tyr	Gln	Thr	Pro	Ala	Val	Lys	Ser	Glu	His	Thr	Gly	Arg
1715						1720					1725			
Glu	Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Thr	Arg	Leu
1730						1735					1740			
Leu	Ser	Ser	Thr	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Ile	Val	Met	Asp
1745						1750					1755			
Glu	Ala	His	Phe	Thr	Asp	Pro	Ser	Ser	Val	Ala	Ala	Arg	Gly	Tyr
1760						1765					1770			
Ile	Ser	Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met
1775						1780					1785			
Thr	Ala	Thr	Pro	Pro	Gly	Ala	Thr	Asp	Pro	Phe	Pro	Gln	Ser	Asn
1790						1795					1800			
Ser	Pro	Ile	Glu	Asp	Ile	Glu	Arg	Glu	Ile	Pro	Glu	Arg	Ser	Trp
1805						1810					1815			
Asn	Thr	Gly	Phe	Asp	Trp	Ile	Thr	Asp	Tyr	Gln	Gly	Lys	Thr	Val
1820						1825					1830			

Trp Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Asn Cys
1835 1840 1845

Leu Arg Lys Ser Gly Lys Lys Val Ile Gln Leu Ser Arg Lys Thr
1850 1855 1860

Phe Asp Thr Glu Tyr Pro Lys Thr Lys Leu Thr Asp Trp Asp Phe
1865 1870 1875

Val Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Arg Ala
1880 1885 1890

Gly Arg Val Ile Asp Pro Arg Arg Cys Leu Lys Pro Val Ile Leu
1895 1900 1905

Thr Asp Gly Pro Glu Arg Val Ile Leu Ala Gly Pro Ile Pro Val
1910 1915 1920

Thr Pro Ala Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn
1925 1930 1935

Pro Ala Gln Glu Asp Asp Gln Tyr Val Phe Ser Gly Asp Pro Leu
1940 1945 1950

Lys Asn Asp Glu Asp His Ala His Trp Thr Glu Ala Lys Met Leu
1955 1960 1965

Leu Asp Asn Ile Tyr Thr Pro Glu Gly Ile Ile Pro Thr Leu Phe
1970 1975 1980

Gly Pro Glu Arg Glu Lys Thr Gln Ala Ile Asp Gly Glu Phe Arg
1985 1990 1995

Leu Arg Gly Glu Gln Arg Lys Thr Phe Val Glu Leu Met Arg Arg
2000 2005 2010

Gly Asp Leu Pro Val Trp Leu Ser Tyr Lys Val Ala Ser Ala Gly
2015 2020 2025

Ile	Ser	Tyr	Lys	Asp	Arg	Glu	Trp	Cys	Phe	Thr	Gly	Glu	Arg	Asn
2030						2035					2040			
Asn	Gln	Ile	Leu	Glu	Glu	Asn	Met	Glu	Val	Glu	Ile	Trp	Thr	Arg
2045						2050					2055			
Glu	Gly	Glu	Lys	Lys	Lys	Leu	Arg	Pro	Arg	Trp	Leu	Asp	Ala	Arg
2060						2065					2070			
Val	Tyr	Ala	Asp	Pro	Met	Ala	Leu	Lys	Asp	Phe	Lys	Glu	Phe	Ala
2075						2080					2085			
Ser	Gly	Arg	Lys	Ser	Ile	Thr	Leu	Asp	Ile	Leu	Thr	Glu	Ile	Ala
2090						2095					2100			
Ser	Leu	Pro	Thr	Tyr	Leu	Ser	Ser	Arg	Ala	Lys	Leu	Ala	Leu	Asp
2105						2110					2115			
Asn	Ile	Val	Met	Leu	His	Thr	Thr	Glu	Arg	Gly	Gly	Arg	Ala	Tyr
2120						2125					2130			
Gln	His	Ala	Leu	Asn	Glu	Leu	Pro	Glu	Ser	Leu	Glu	Thr	Leu	Met
2135						2140					2145			
Leu	Val	Ala	Leu	Leu	Gly	Ala	Met	Thr	Ala	Gly	Ile	Phe	Leu	Phe
2150						2155					2160			
Phe	Met	Gln	Gly	Lys	Gly	Ile	Gly	Lys	Leu	Ser	Met	Gly	Leu	Ile
2165						2170					2175			
Thr	Ile	Ala	Val	Ala	Ser	Gly	Leu	Leu	Trp	Val	Ala	Glu	Ile	Gln
2180						2185					2190			
Pro	Gln	Trp	Ile	Ala	Ala	Ser	Ile	Ile	Leu	Glu	Phe	Phe	Leu	Met
2195						2200					2205			
Val	Leu	Leu	Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Thr	Pro	Gln	Asp
2210						2215					2220			
Asn	Gln	Leu	Ile	Tyr	Val	Ile	Leu	Thr	Ile	Leu	Thr	Ile	Ile	Gly
2225						2230					2235			

Leu Ile Ala Ala Asn Glu Met Gly Leu Ile Glu Lys Thr Lys Thr
2240 2245 2250

Asp Phe Gly Phe Tyr Gln Val Lys Thr Glu Thr Thr Ile Leu Asp
2255 2260 2265

Val Asp Leu Arg Pro Ala Ser Ala Trp Thr Leu Tyr Ala Val Ala
2270 2275 2280

Thr Thr Ile Leu Thr Pro Met Leu Arg His Thr Ile Glu Asn Thr
2285 2290 2295

Ser Ala Asn Leu Ser Leu Ala Ala Ile Ala Asn Gln Ala Ala Val
2300 2305 2310

Leu Met Gly Leu Gly Lys Gly Trp Pro Leu His Arg Met Asp Leu
2315 2320 2325

Gly Val Pro Leu Leu Ala Met Gly Cys Tyr Ser Gln Val Asn Pro
2330 2335 2340

Thr Thr Leu Thr Ala Ser Leu Val Met Leu Leu Val His Tyr Ala
2345 2350 2355

Ile Ile Gly Pro Gly Leu Gln Ala Lys Ala Thr Arg Glu Ala Gln
2360 2365 2370

Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Thr Val Asp Gly
2375 2380 2385

Ile Thr Val Ile Asp Leu Glu Pro Ile Ser Tyr Asp Pro Lys Phe
2390 2395 2400

Glu Lys Gln Leu Gly Gln Val Met Leu Leu Val Leu Cys Ala Gly
2405 2410 2415

Gln Leu Leu Leu Met Arg Thr Thr Trp Ala Phe Cys Glu Val Leu
2420 2425 2430

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

Glu Glu Gly Arg Thr Leu Arg Val Leu Lys Met Val Glu Pro Trp
2645 2650 2655

Leu Ser Ser Lys Pro Glu Phe Cys Ile Lys Val Leu Asn Pro Tyr
2660 2665 2670

Met Pro Thr Val Ile Glu Glu Leu Glu Lys Leu Gln Arg Lys His
2675 2680 2685

Gly Gly Asn Leu Val Arg Cys Pro Leu Ser Arg Asn Ser Thr His
2690 2695 2700

Glu Met Tyr Trp Val Ser Gly Ala Ser Gly Asn Ile Val Ser Ser
2705 2710 2715

Val Asn Thr Thr Ser Lys Met Leu Leu Asn Arg Phe Thr Thr Arg
2720 2725 2730

His Arg Lys Pro Thr Tyr Glu Lys Asp Val Asp Leu Gly Ala Gly
2735 2740 2745

Thr Arg Ser Val Ser Thr Glu Thr Glu Lys Pro Asp Met Thr Ile
2750 2755 2760

Ile Gly Arg Arg Leu Gln Arg Leu Gln Glu Glu His Lys Glu Thr
2765 2770 2775

Trp His Tyr Asp Gln Glu Asn Pro Tyr Arg Thr Trp Ala Tyr His
2780 2785 2790

Gly Ser Tyr Glu Ala Pro Ser Thr Gly Ser Ala Ser Ser Met Val
2795 2800 2805

Asn Gly Val Val Lys Leu Leu Thr Lys Pro Trp Asp Val Val Pro
2810 2815 2820

Met Val Thr Gln Leu Ala Met Thr Asp Thr Thr Pro Phe Gly Gln
2825 2830 2835

Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg Thr Pro Gln Pro
2840 2845 2850

Lys Pro Gly Thr Arg Met Val Met Thr Thr Thr Ala Asn Trp Leu
2855 2860 2865

Trp Ala Leu Leu Gly Lys Lys Lys Asn Pro Arg Leu Cys Thr Arg
2870 2875 2880

Glu Glu Phe Ile Ser Lys Val Arg Ser Asn Ala Ala Ile Gly Ala
2885 2890 2895

Val Phe Gln Glu Glu Gln Gly Trp Thr Ser Ala Ser Glu Ala Val
2900 2905 2910

Asn Asp Ser Arg Phe Trp Glu Leu Val Asp Lys Glu Arg Ala Leu
2915 2920 2925

His Gln Glu Gly Lys Cys Glu Ser Cys Val Tyr Asn Met Met Gly
2930 2935 2940

Lys Arg Glu Lys Lys Leu Gly Glu Phe Gly Arg Ala Lys Gly Ser
2945 2950 2955

Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg Phe Leu Glu Phe
2960 2965 2970

Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp Phe Gly Arg Glu
2975 2980 2985

Asn Ser Trp Ser Gly Val Glu Gly Glu Gly Leu His Arg Leu Gly
2990 2995 3000

Tyr Ile Leu Glu Glu Ile Asp Lys Lys Asp Gly Asp Leu Met Tyr
3005 3010 3015

Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile Thr Glu Asp Asp
3020 3025 3030

Leu Gln Asn Glu Glu Leu Ile Thr Glu Gln Met Ala Pro His His
3035 3040 3045

Lys Ile Leu Ala Lys Ala Ile Phe Lys Leu Thr Tyr Gln Asn Lys
3050 3055 3060

Val Val Lys Val Leu Arg Pro Thr Pro Arg Gly Ala Val Met Asp
3065 3070 3075

Ile Ile Ser Arg Lys Asp Gln Arg Gly Ser Gly Gln Val Gly Thr
3080 3085 3090

Tyr Gly Leu Asn Thr Phe Thr Asn Met Glu Val Gln Leu Ile Arg
3095 3100 3105

Gln Met Glu Ala Glu Gly Val Ile Thr Gln Asp Asp Met Gln Asn
3110 3115 3120

Pro Lys Gly Leu Lys Glu Arg Val Glu Lys Trp Leu Lys Glu Cys
3125 3130 3135

Gly Val Asp Arg Leu Lys Arg Met Ala Ile Ser Gly Asp Asp Cys
3140 3145 3150

Val Val Lys Pro Leu Asp Glu Arg Phe Gly Thr Ser Leu Leu Phe
3155 3160 3165

Leu Asn Asp Met Gly Lys Val Arg Lys Asp Ile Pro Gln Trp Glu
3170 3175 3180

Pro Ser Lys Gly Trp Lys Asn Trp Gln Glu Val Pro Phe Cys Ser
3185 3190 3195

His His Phe His Lys Ile Phe Met Lys Asp Gly Arg Ser Leu Val
3200 3205 3210

Val Pro Cys Arg Asn Gln Asp Glu Leu Ile Gly Arg Ala Arg Ile
3215 3220 3225

Ser Gln Gly Ala Gly Trp Ser Leu Arg Glu Thr Ala Cys Leu Gly
3230 3235 3240

Lys Ala Tyr Ala Gln Met Trp Ser Leu Met Tyr Phe His Arg Arg
3245 3250 3255

Asp Leu Arg Leu Ala Ser Met Ala Ile Cys Ser Ala Val Pro Thr
3260 3265 3270

Glu Trp Phe Pro Thr Ser Arg Thr Thr Trp Ser Ile His Ala His
3275 3280 3285

His Gln Trp Met Thr Thr Glu Asp Met Leu Lys Val Trp Asn Arg
3290 3295 3300

Val Trp Ile Glu Asp Asn Pro Asn Met Thr Asp Lys Thr Pro Val
3305 3310 3315

His Ser Trp Glu Asp Ile Pro Tyr Leu Gly Lys Arg Glu Asp Leu
3320 3325 3330

Trp Cys Gly Ser Leu Ile Gly Leu Ser Ser Arg Ala Thr Trp Ala
3335 3340 3345

Lys Asn Ile His Thr Ala Ile Thr Gln Val Arg Asn Leu Ile Gly
3350 3355 3360

Lys Glu Glu Tyr Val Asp Tyr Met Pro Val Met Lys Arg Tyr Ser
3365 3370 3375

Ala Pro Ser Glu Ser Glu Gly Val Leu
3380 3385