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<110> UNIVERSITY OF MASSACHUSETTS

<120> Targeted CRISPR Delivery Platforms

<130> UMASS-W-19215

<140> PCT/US18/60126

<141> 2018-11-09

<150> US 62/584,310

<151> 2017-11-10

<150> US 62/596,375

<151> 2017-12-08

<150> US 62/667,084

<151> 2018-05-04

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<170> PatentIn version 3.5

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35 40 45

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Ala Arg Ser Val Arg Arg Leu Thr Arg Arg Arg Ala His Arg Leu Leu
65 70 75 80

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85 90 95

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

Arg Leu Asn Glu Lys Gly Tyr Val Glu Ile Asp His Ala Leu Pro Phe
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785 790 795 800

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Arg Pro Glu Ala Val His Glu Tyr Val Thr Pro Leu Phe Val Ser Arg
820 825 830

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850 855 860

Trp Leu Thr Glu Ile Lys Leu Ala Asp Leu Glu Asn Met Val Asn Tyr
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Pro Phe Tyr Lys Lys Gly Gly Gln Leu Val Lys Ala Val Arg Val Glu
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Ile Ala Asp Asn Gly Asp Met Val Arg Val Asp Val Phe Cys Lys Val
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480

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720

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780

gagcctgcag agccaaaggc cgccaagaac acctacacag ccgagcggtt tatctggctg
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900

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Glu Asn Pro Ile Arg Leu Ile Asp Leu Gly Val Arg Val Phe Glu Arg
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Ala Glu Val Pro Lys Thr Gly Asp Ser Leu Ala Met Ala Arg Arg Leu
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Ala Arg Ser Val Arg Arg Leu Thr Arg Arg Arg Ala His Arg Leu Leu
65 70 75 80

Arg Ala Arg Arg Leu Leu Lys Arg Glu Gly Val Leu Gln Ala Ala Asp
85 90 95

Phe Asp Glu Asn Gly Leu Ile Lys Ser Leu Pro Asn Thr Pro Trp Gln
100 105 110

Leu Arg Ala Ala Ala Leu Asp Arg Lys Leu Thr Pro Leu Glu Trp Ser
115 120 125

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

Lys Asn Glu Gly Glu Thr Ala Asp Lys Glu Leu Gly Ala Leu Leu Lys
145 150 155 160

Gly Val Ala Asn Asn Ala His Ala Leu Gln Thr Gly Asp Phe Arg Thr
165 170 175

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

Leu Arg Asn Gln Arg Gly Asp Tyr Ser His Thr Phe Ser Arg Lys Asp
195 200 205

Leu Gln Ala Glu Leu Ile Leu Leu Phe Glu Lys Gln Lys Glu Phe Gly
210 215 220

Asn Pro His Val Ser Gly Gly Leu Lys Glu Gly Ile Glu Thr Leu Leu
225 230 235 240

Met Thr Gln Arg Pro Ala Leu Ser Gly Asp Ala Val Gln Lys Met Leu
245 250 255

Gly His Cys Thr Phe Glu Pro Ala Glu Pro Lys Ala Ala Lys Asn Thr
260 265 270

Tyr Thr Ala Glu Arg Phe Ile Trp Leu Thr Lys Leu Asn Asn Leu Arg
275 280 285

Ile Leu Glu Gln Gly Ser Glu Arg Pro Leu Thr Asp Thr Glu Arg Ala
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Thr Leu Met Asp Glu Pro Tyr Arg Lys Ser Lys Leu Thr Tyr Ala Gln
305 310 315 320

Ala Arg Lys Leu Leu Gly Leu Glu Asp Thr Ala Phe Phe Lys Gly Leu
325 330 335

Arg Tyr Gly Lys Asp Asn Ala Glu Ala Ser Thr Leu Met Glu Met Lys
340 345 350

Ala Tyr His Ala Ile Ser Arg Ala Leu Glu Lys Glu Gly Leu Lys Asp
355 360 365

Lys Lys Ser Pro Leu Asn Leu Ser Ser Glu Leu Gln Asp Glu Ile Gly
370 375 380

Thr Ala Phe Ser Leu Phe Lys Thr Asp Glu Asp Ile Thr Gly Arg Leu
385 390 395 400

Lys Asp Arg Val Gln Pro Glu Ile Leu Glu Ala Leu Leu Lys His Ile
405 410 415

Ser Phe Asp Lys Phe Val Gln Ile Ser Leu Lys Ala Leu Arg Arg Ile
420 425 430

Val Pro Leu Met Glu Gln Gly Lys Arg Tyr Asp Glu Ala Cys Ala Glu
435 440 445

Ile Tyr Gly Asp His Tyr Gly Lys Lys Asn Thr Glu Glu Lys Ile Tyr
450 455 460

Leu Pro Pro Ile Pro Ala Asp Glu Ile Arg Asn Pro Val Val Leu Arg
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Ala Leu Ser Gln Ala Arg Lys Val Ile Asn Gly Val Val Arg Arg Tyr
485 490 495

Gly Ser Pro Ala Arg Ile His Ile Glu Thr Ala Arg Glu Val Gly Lys
500 505 510

Ser Phe Lys Asp Arg Lys Glu Ile Glu Lys Arg Gln Glu Glu Asn Arg
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Lys Asp Arg Glu Lys Ala Ala Ala Lys Phe Arg Glu Tyr Phe Pro Asn
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Phe Val Gly Glu Pro Lys Ser Lys Asp Ile Leu Lys Leu Arg Leu Tyr
545 550 555 560

Glu Gln Gln His Gly Lys Cys Leu Tyr Ser Gly Lys Glu Ile Asn Leu
565 570 575

Val Arg Leu Asn Glu Lys Gly Tyr Val Glu Ile Asp His Ala Leu Pro
580 585 590

Phe Ser Arg Thr Trp Asp Asp Ser Phe Asn Asn Lys Val Leu Val Leu
595 600 605

Gly Ser Glu Asn Gln Asn Lys Gly Asn Gln Thr Pro Tyr Glu Tyr Phe
610 615 620

Asn	Gly	Lys	Asp	Asn	Ser	Arg	Glu	Trp	Gln	Glu	Phe	Lys	Ala	Arg	Val	625	630	635	640
Glu	Thr	Ser	Arg	Phe	Pro	Arg	Ser	Lys	Lys	Gln	Arg	Ile	Leu	Leu	Gln	645	650	655	
Lys	Phe	Asp	Glu	Asp	Gly	Phe	Lys	Glu	Cys	Asn	Leu	Asn	Asp	Thr	Arg	660	665	670	
Tyr	Val	Asn	Arg	Phe	Leu	Cys	Gln	Phe	Val	Ala	Asp	His	Ile	Leu	Leu	675	680	685	
Thr	Gly	Lys	Gly	Lys	Arg	Arg	Val	Phe	Ala	Ser	Asn	Gly	Gln	Ile	Thr	690	695	700	
Asn	Leu	Leu	Arg	Gly	Phe	Trp	Gly	Leu	Arg	Lys	Val	Arg	Ala	Glu	Asn	705	710	715	720
Asp	Arg	His	His	Ala	Leu	Asp	Ala	Val	Val	Val	Ala	Cys	Ser	Thr	Val	725	730	735	
Ala	Met	Gln	Gln	Lys	Ile	Thr	Arg	Phe	Val	Arg	Tyr	Lys	Glu	Met	Asn	740	745	750	
Ala	Phe	Asp	Gly	Lys	Thr	Ile	Asp	Lys	Glu	Thr	Gly	Lys	Val	Leu	His	755	760	765	
Gln	Lys	Thr	His	Phe	Pro	Gln	Pro	Trp	Glu	Phe	Phe	Ala	Gln	Glu	Val	770	775	780	
Met	Ile	Arg	Val	Phe	Gly	Lys	Pro	Asp	Gly	Lys	Pro	Glu	Phe	Glu	Glu	785	790	795	800
Ala	Asp	Thr	Pro	Glu	Lys	Leu	Arg	Thr	Leu	Leu	Ala	Glu	Lys	Leu	Ser	805	810	815	
Ser	Arg	Pro	Glu	Ala	Val	His	Glu	Tyr	Val	Phe	Pro	Leu	Phe	Val	Ser	820	825	830	
Arg	Ala	Pro	Asn	Arg	Lys	Met	Ser	Gly	Ala	His	Lys	Asp	Thr	Leu	Arg	835	840	845	

Ser Ala Lys Arg Phe Val Lys His Asn Glu Lys Ile Ser Val Lys Arg
850 855 860

Val Trp Leu Thr Glu Ile Lys Leu Ala Asp Leu Glu Asn Met Val Asn
865 870 875 880

Tyr Lys Asn Gly Arg Glu Ile Glu Leu Tyr Glu Ala Leu Lys Ala Arg
885 890 895

Leu Glu Ala Tyr Gly Gly Asn Ala Lys Gln Ala Phe Asp Pro Lys Asp
900 905 910

Asn Pro Phe Tyr Lys Lys Gly Gly Gln Leu Val Lys Ala Val Arg Val
915 920 925

Glu Lys Thr Gln Glu Ser Gly Val Leu Leu Asn Lys Lys Asn Ala Tyr
930 935 940

Thr Ile Ala Asp Asn Gly Asp Met Val Arg Val Asp Val Phe Cys Lys
945 950 955 960

Val Asp Lys Lys Gly Lys Asn Gln Tyr Phe Ile Val Pro Ile Tyr Ala
965 970 975

Trp Gln Val Ala Glu Asn Ile Leu Pro Asp Ile Asp Cys Lys Gly Tyr
980 985 990

Arg Ile Asp Asp Ser Tyr Thr Phe Cys Phe Ser Leu His Lys Tyr Asp
995 1000 1005

Leu Ile Ala Phe Gln Lys Asp Glu Lys Ser Lys Val Glu Phe Ala
1010 1015 1020

Tyr Tyr Ile Asn Cys Asp Ser Ser Asn Gly Arg Phe Tyr Leu Ala
1025 1030 1035

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

Gly Thr Gly Gly Pro Lys Lys Lys Arg Lys Val Tyr Pro Tyr Asp
1085 1090 1095

Val Pro Asp Tyr Ala Gly Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
1100 1105 1110

Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Gly Ser Ala Ala
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Pro Ala Ala Lys Lys Lys Lys Leu Asp Phe Glu Ser Gly
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35 40 45

Pro Lys Thr Gly Glu Ser Leu Ala Leu Ser Arg Arg Leu Ala Arg Ser
50 55 60

Ala Arg Arg Leu Thr Gln Arg Arg Val Ala Arg Leu Lys Lys Ala Lys
65 70 75 80

Arg Leu Leu Lys Ser Glu Asn Ile Leu Leu Ser Thr Asp Glu Arg Leu
85 90 95

Pro His Gln Val Trp Gln Leu Arg Val Glu Gly Leu Asp His Lys Leu
100 105 110

Glu Arg Gln Glu Trp Ala Ala Val Leu Leu His Leu Ile Lys His Arg
115 120 125

Gly Tyr Leu Ser Gln Arg Lys Asn Glu Ser Lys Ser Glu Asn Lys Glu
130 135 140

Leu Gly Ala Leu Leu Ser Gly Val Asp Asn Asn His Lys Leu Leu Gln
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Gln Ala Thr Tyr Arg Ser Pro Ala Glu Leu Ala Val Lys Lys Phe Glu
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Val Glu Glu Gly His Ile Arg Asn Gln Gln Gly Ala Tyr Thr His Thr
180 185 190

Phe Ser Arg Leu Asp Leu Leu Ala Glu Met Glu Leu Leu Phe Ser Arg
195 200 205

Gln Gln His Phe Gly Asn Pro Phe Ala Ser Glu Lys Leu Leu Glu Asn
210 215 220

Leu Thr Ala Leu Leu Met Trp Gln Lys Pro Ala Leu Ser Gly Glu Ala
225 230 235 240

Ile Leu Lys Met Leu Gly Lys Cys Thr Phe Glu Asp Glu Tyr Lys Ala
245 250 255

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

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

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

Val Glu Val Asp His Ala Leu Pro Phe Ser Arg Thr Trp Asp Asp Ser
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595 600 605

Asn Leu Thr Pro Phe Glu Trp Leu Asp Gly Lys His Asn Ser Glu Arg
610 615 620

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

Phe Ile Ala Asp Asn Met His Leu Thr Gly Glu Gly Lys Arg Lys Val
675 680 685

Phe Ala Ser Asn Gly Gln Ile Thr Ala Leu Leu Arg Ser Arg Trp Gly
690 695 700

Leu Ala Lys Ser Arg Glu Asp Asn Asp Arg His His Ala Leu Asp Ala
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Val Val Val Ala Cys Ser Thr Val Ala Met Gln Gln Lys Ile Thr Arg
725 730 735

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Glu Val Met Asp Asn Ser Ala Thr Phe Lys Phe Ser Leu His Pro Asn
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Asp Leu Val Lys Leu Val Thr Lys Lys Lys Thr Ile Leu Gly Tyr Phe
980 985 990

Asn Gly Leu Asn Arg Ala Thr Gly Asn Ile Asp Ile Lys Glu His Asp
995 1000 1005

Leu Asp Lys Ser Lys Gly Lys Gln Gly Ile Phe Glu Gly Val Gly
1010 1015 1020

Ile Lys Leu Ala Leu Ser Phe Glu Lys Tyr Gln Val Asp Glu Leu
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Gly Lys Asn Ile Arg Leu Cys Lys Pro Ser Lys Arg Gln Pro Val
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aaaagtaaat tgacttacgc acaagttcgc aaattattaa gcttgcctca aactgctatt
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1440

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cgtgaattgg gtaagtctaa atcagaccgt gaccgaattg aaaaacaaca aaaaaaaaaat
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aaaaaagaac gtgaaaacgc agtcgccaaa ttcaaagaag atttcctga ttttgtgggc
1620

gaaccagag ggaaagatat ttgaaaatg cgtttgtatg aacaacaaca cggcaaatgt
1680

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1740

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1800

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1860

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1920

ggtaaaaaac aacgcattca attagccaaa ttagacgatg aaaccgaaaa aggattttta
1980

gaacgcaatc taaatgatac gcggtatatt gctcgtttta tgtgtcaatt tgtccaagaa
2040

aatttatatt tgacaggtaa aggaaaacgt cttgtttttg catcaaacgg cggaatgacc
2100

gcaacattga gaaatttatg gggtttgaga aaagtccgtg aagacaacga cgcctatcat
2160

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2280

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2400

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2460

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2520

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2580

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2880

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3000

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3060

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3180

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3192

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<211> 1063

<212> PRT

<213> S. muelleri

<400> 239

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Val	Gly	Trp	Ala	Ala	Ile	Glu	Ile	Asp	Lys	Glu	Thr	Glu	Thr	Ser	Ile
			20					25					30		

Gly	Leu	Leu	Asp	Cys	Gly	Val	Arg	Thr	Phe	Glu	Arg	Ala	Glu	Val	Pro
		35					40					45			

Lys Thr Gly Asp Ser Leu Ala Lys Ala Arg Arg Glu Ala Arg Ser Thr
50 55 60

Arg Arg Leu Ile Arg Arg Arg Ser His Arg Leu Leu Arg Leu Lys Arg
65 70 75 80

Leu Leu Lys Arg Glu Ile Phe Arg Gln Pro Glu Thr Phe Lys Asp Leu
85 90 95

Pro Ile Asn Ala Trp Gln Leu Arg Val Lys Gly Leu Asp Ser Arg Leu
100 105 110

Asn Glu Tyr Glu Trp Ala Ala Val Leu Leu His Leu Val Lys His Arg
115 120 125

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

Ser Glu Met Gly Arg Leu Leu Ala Gly Val Ala Glu Asn His Gln Leu
145 150 155 160

Leu Gln Gln Glu Gln Tyr Arg Thr Pro Ala Glu Leu Ala Leu Lys Lys
165 170 175

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

Asn Arg Leu Asp Leu Gln Ala Glu Leu His Leu Leu Phe Gln Lys Gln
195 200 205

Arg Glu Leu Gly Asn Pro Phe Thr Ser Pro Glu Leu Glu Arg Gln Val
210 215 220

Asp Asp Leu Leu Met Thr Gln Arg Ser Ala Leu Gln Gly Asp Ala Ile
225 230 235 240

Leu Lys Met Leu Gly His Cys Gly Phe Glu Pro Glu Gln Phe Lys Ala
245 250 255

Ala Lys Asn Thr Phe Ser Ala Glu Arg Phe Ile Trp Leu Thr Lys Leu
260 265 270

Asn Asn Leu Arg Ile Gln Asp Gln Gly Lys Glu Arg Ala Leu Thr Ala
275 280 285

Asp Glu Arg Thr Lys Leu Leu Asp Glu Pro Tyr Lys Lys Ser Lys Leu
290 295 300

Thr Tyr Ala Gln Val Arg Lys Leu Leu Ser Leu Pro Gln Thr Ala Ile
305 310 315 320

Phe Lys Gly Leu Arg Tyr Asp Leu Glu His Asp Lys Lys Ala Glu Asn
325 330 335

Ser Thr Leu Met Glu Met Lys Ser Tyr His Asn Ile Arg Gln Thr Leu
340 345 350

Glu Lys Ser Gly Leu Lys Thr Glu Trp Gln Ser Ile Ala Thr Gln Pro
355 360 365

Glu Ile Leu Asp Ala Ile Gly Thr Ala Phe Ser Ile Tyr Lys Thr Asp
370 375 380

Glu Asp Ile Ser His Glu Leu Lys Thr Cys Arg Leu Pro Glu Asn Val
385 390 395 400

Leu Asn Glu Leu Leu Lys Asn Ile Asn Phe Asp Gly Phe Ile Gln Leu
405 410 415

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

Arg Tyr Asp Glu Ala Cys Thr Gln Ile Tyr Gly Asn His His Ser Gly
435 440 445

Ser Leu Gln Gln Glu Ser Lys Gln Phe Leu Pro His Ile Pro Ile Asp
450 455 460

Asp Val Arg Asn Pro Val Val Phe Arg Thr Leu Thr Gln Ala Arg Lys
465 470 475 480

Val Val Asn Ala Ile Ile Arg Arg Tyr Gly Ser Pro Ala Arg Val His
485 490 495

Ile Glu Met Ala Arg Glu Leu Gly Lys Ser Lys Ser Asp Arg Asp Arg
500 505 510

Ile Glu Lys Gln Gln Gln Lys Asn Lys Lys Glu Arg Glu Asn Ala Val
515 520 525

Ala Lys Phe Lys Glu Asp Phe Pro Asp Phe Val Gly Glu Pro Arg Gly
530 535 540

Lys Asp Ile Leu Lys Met Arg Leu Tyr Glu Gln Gln His Gly Lys Cys
545 550 555 560

Leu Tyr Ser Gly His Asp Ile Asp Ile Asn Arg Leu Asn Glu Lys Gly
565 570 575

Tyr Val Glu Ile Asp His Ala Leu Pro Phe Ser Arg Thr Trp Asp Asp
580 585 590

Ser Gln Asn Asn Lys Val Leu Val Leu Gly Ser Glu Asn Gln Asn Lys
595 600 605

Arg Asn Gln Thr Pro Asp Glu Tyr Leu Asp Gly Ala Asn Asn Ser Gln
610 615 620

Arg Trp Leu Glu Phe Gln Ala Arg Val Gln Thr Cys His Phe Ser Tyr
625 630 635 640

Gly Lys Lys Gln Arg Ile Gln Leu Ala Lys Leu Asp Asp Glu Thr Glu
645 650 655

Lys Gly Phe Leu Glu Arg Asn Leu Asn Asp Thr Arg Tyr Ile Ala Arg
660 665 670

Phe Met Cys Gln Phe Val Gln Glu Asn Leu Tyr Leu Thr Gly Lys Gly
675 680 685

Lys Arg Leu Val Phe Ala Ser Asn Gly Gly Met Thr Ala Thr Leu Arg
690 695 700

Asn Leu Trp Gly Leu Arg Lys Val Arg Glu Asp Asn Asp Arg His His
705 710 715 720

Ala Leu Asp Ala Ile Val Val Ala Cys Ser Thr Ala Ser Met Gln Gln
725 730 735

Lys Ile Thr Lys Ala Phe Gln Arg His Glu Ser Ile Glu Tyr Val Asp
740 745 750

Thr Glu Thr Gly Glu Val Lys Phe Arg Ile Pro Gln Pro Trp Asp Phe
755 760 765

Phe Arg Gln Glu Val Met Ile Arg Val Phe Ser Asp Gln Pro Cys Glu
770 775 780

Asp Leu Val Glu Lys Leu Ser Ala Arg Pro Glu Ala Leu His Asp Asn
785 790 795 800

Val Thr Pro Leu Phe Val Ser Arg Ala Pro Asn Arg Lys Met Ser Gly
805 810 815

Gln Gly His Leu Glu Thr Ile Lys Ser Ala Lys Arg Leu Ser Glu Glu
820 825 830

Asn Ser Met Val Lys Lys Pro Leu Thr Thr Leu Lys Leu Lys Asp Ile
835 840 845

Pro Glu Ile Val Gly Tyr Pro Ser Arg Glu Pro Gln Leu Tyr Ala Ala
850 855 860

Leu Lys Thr Arg Leu Glu Thr His Asp Asp Asp Pro Ile Lys Ala Phe
865 870 875 880

Ala Lys Pro Phe Tyr Lys Pro Asn Lys Asn Gly Glu Leu Gly Ala Leu
885 890 895

Val Arg Ser Val Arg Val Lys Gly Val Gln Asn Thr Gly Val Met Val
900 905 910

His Asp Gly Lys Gly Ile Ala Asp Asn Ala Thr Met Val Arg Val Asp
915 920 925

Val Tyr Thr Lys Ala Gly Lys Asn Tyr Leu Val Pro Val Tyr Val Trp
930 935 940

Gln Val Ala Gln Gly Ile Leu Pro Asn Arg Ala Val Thr Ser Gly Lys
945 950 955 960

Ser Glu Ala Asp Trp Asp Leu Ile Asp Glu Ser Phe Glu Phe Lys Phe
965 970 975

Ser Leu Ser Arg Gly Asp Leu Val Glu Met Ile Ser Asn Lys Gly Arg
980 985 990

Ile Phe Gly Tyr Tyr Asn Gly Leu Asp Arg Ala Asn Gly Ser Ile Gly
995 1000 1005

Ile Arg Glu His Asp Leu Glu Lys Ser Lys Gly Lys Asp Gly Val
1010 1015 1020

His Arg Val Gly Val Lys Thr Ala Thr Ala Phe Asn Lys Tyr His
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Arg Pro Thr Leu Lys Ile Lys Ser Lys Lys
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120

acctttgaga gggcagaggt gcctaagaca ggcgacagcc tggcaaaggc aaggagagag
180

gcaaggtcta caaggcgctt gatccggaga aggagccaca ggctgctgcg gctgaagaga
240

ctgctgaagc gggagatctt tagacagcca gagaccttca aggatctgcc catcaacgca
300

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360

ctgctgcacc tgggtgaagca caggggctat ctgagccagc gcaagtccga gatgtctgag
420

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540

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1980

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2160

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3180

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<211> 1121
<212> PRT
<213> Artificial Sequence

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<223> Synthetic

<400> 241

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Val Gly Trp Ala Ala Ile Glu Ile Asp Lys Glu Thr Glu Thr Ser Ile
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Gly Leu Leu Asp Cys Gly Val Arg Thr Phe Glu Arg Ala Glu Val Pro
35 40 45

Lys Thr Gly Asp Ser Leu Ala Lys Ala Arg Arg Glu Ala Arg Ser Thr
50 55 60

Arg Arg Leu Ile Arg Arg Arg Ser His Arg Leu Leu Arg Leu Lys Arg
65 70 75 80

Leu Leu Lys Arg Glu Ile Phe Arg Gln Pro Glu Thr Phe Lys Asp Leu
85 90 95

Pro Ile Asn Ala Trp Gln Leu Arg Val Lys Gly Leu Asp Ser Arg Leu
100 105 110

Asn Glu Tyr Glu Trp Ala Ala Val Leu Leu His Leu Val Lys His Arg
115 120 125

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

Ser Glu Met Gly Arg Leu Leu Ala Gly Val Ala Glu Asn His Gln Leu
145 150 155 160

Leu Gln Gln Glu Gln Tyr Arg Thr Pro Ala Glu Leu Ala Leu Lys Lys
165 170 175

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

Asn Arg Leu Asp Leu Gln Ala Glu Leu His Leu Leu Phe Gln Lys Gln
195 200 205

Arg Glu Leu Gly Asn Pro Phe Thr Ser Pro Glu Leu Glu Arg Gln Val
210 215 220

Asp Asp Leu Leu Met Thr Gln Arg Ser Ala Leu Gln Gly Asp Ala Ile
225 230 235 240

Leu Lys Met Leu Gly His Cys Gly Phe Glu Pro Glu Gln Phe Lys Ala
245 250 255

Ala Lys Asn Thr Phe Ser Ala Glu Arg Phe Ile Trp Leu Thr Lys Leu
260 265 270

Asn Asn Leu Arg Ile Gln Asp Gln Gly Lys Glu Arg Ala Leu Thr Ala
275 280 285

Asp Glu Arg Thr Lys Leu Leu Asp Glu Pro Tyr Lys Lys Ser Lys Leu
290 295 300

Thr Tyr Ala Gln Val Arg Lys Leu Leu Ser Leu Pro Gln Thr Ala Ile
305 310 315 320

Phe Lys Gly Leu Arg Tyr Asp Leu Glu His Asp Lys Lys Ala Glu Asn
325 330 335

Ser Thr Leu Met Glu Met Lys Ser Tyr His Asn Ile Arg Gln Thr Leu
340 345 350

Glu Lys Ser Gly Leu Lys Thr Glu Trp Gln Ser Ile Ala Thr Gln Pro
355 360 365

Glu Ile Leu Asp Ala Ile Gly Thr Ala Phe Ser Ile Tyr Lys Thr Asp
370 375 380

Glu Asp Ile Ser His Glu Leu Lys Thr Cys Arg Leu Pro Glu Asn Val

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Ser	Leu	Thr	Ala	Leu	Arg	Lys	Ile	Leu	Pro	Leu	Met	Glu	Gln	Gly	Tyr
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Arg	Tyr	Asp	Glu	Ala	Cys	Thr	Gln	Ile	Tyr	Gly	Asn	His	His	Ser	Gly
		435					440					445			
Ser	Leu	Gln	Gln	Glu	Ser	Lys	Gln	Phe	Leu	Pro	His	Ile	Pro	Ile	Asp
	450					455					460				
Asp	Val	Arg	Asn	Pro	Val	Val	Phe	Arg	Thr	Leu	Thr	Gln	Ala	Arg	Lys
465					470					475					480
Val	Val	Asn	Ala	Ile	Ile	Arg	Arg	Tyr	Gly	Ser	Pro	Ala	Arg	Val	His
			485						490					495	
Ile	Glu	Met	Ala	Arg	Glu	Leu	Gly	Lys	Ser	Lys	Ser	Asp	Arg	Asp	Arg
			500					505					510		
Ile	Glu	Lys	Gln	Gln	Gln	Lys	Asn	Lys	Lys	Glu	Arg	Glu	Asn	Ala	Val
		515					520					525			
Ala	Lys	Phe	Lys	Glu	Asp	Phe	Pro	Asp	Phe	Val	Gly	Glu	Pro	Arg	Gly
	530					535					540				
Lys	Asp	Ile	Leu	Lys	Met	Arg	Leu	Tyr	Glu	Gln	Gln	His	Gly	Lys	Cys
545					550					555					560
Leu	Tyr	Ser	Gly	His	Asp	Ile	Asp	Ile	Asn	Arg	Leu	Asn	Glu	Lys	Gly
			565						570					575	
Tyr	Val	Glu	Ile	Asp	His	Ala	Leu	Pro	Phe	Ser	Arg	Thr	Trp	Asp	Asp
		580						585					590		
Ser	Gln	Asn	Asn	Lys	Val	Leu	Val	Leu	Gly	Ser	Glu	Asn	Gln	Asn	Lys
		595					600					605			

Arg Asn Gln Thr Pro Asp Glu Tyr Leu Asp Gly Ala Asn Asn Ser Gln
610 615 620

Arg Trp Leu Glu Phe Gln Ala Arg Val Gln Thr Cys His Phe Ser Tyr
625 630 635 640

Gly Lys Lys Gln Arg Ile Gln Leu Ala Lys Leu Asp Asp Glu Thr Glu
645 650 655

Lys Gly Phe Leu Glu Arg Asn Leu Asn Asp Thr Arg Tyr Ile Ala Arg
660 665 670

Phe Met Cys Gln Phe Val Gln Glu Asn Leu Tyr Leu Thr Gly Lys Gly
675 680 685

Lys Arg Leu Val Phe Ala Ser Asn Gly Gly Met Thr Ala Thr Leu Arg
690 695 700

Asn Leu Trp Gly Leu Arg Lys Val Arg Glu Asp Asn Asp Arg His His
705 710 715 720

Ala Leu Asp Ala Ile Val Val Ala Cys Ser Thr Ala Ser Met Gln Gln
725 730 735

Lys Ile Thr Lys Ala Phe Gln Arg His Glu Ser Ile Glu Tyr Val Asp
740 745 750

Thr Glu Thr Gly Glu Val Lys Phe Arg Ile Pro Gln Pro Trp Asp Phe
755 760 765

Phe Arg Gln Glu Val Met Ile Arg Val Phe Ser Asp Gln Pro Cys Glu
770 775 780

Asp Leu Val Glu Lys Leu Ser Ala Arg Pro Glu Ala Leu His Asp Asn
785 790 795 800

Val Thr Pro Leu Phe Val Ser Arg Ala Pro Asn Arg Lys Met Ser Gly
805 810 815

Gln Gly His Leu Glu Thr Ile Lys Ser Ala Lys Arg Leu Ser Glu Glu

820	825	830
Asn Ser Met Val Lys Lys Pro Leu Thr Ile Leu Lys Leu Lys Asp Ile		
835	840	845
Pro Glu Ile Val Gly Tyr Pro Ser Arg Glu Pro Gln Leu Tyr Ala Ala		
850	855	860
Leu Lys Thr Arg Leu Glu Thr His Asp Asp Asp Pro Ile Lys Ala Phe		
865	870	875
Ala Lys Pro Phe Tyr Lys Pro Asn Lys Asn Gly Glu Leu Gly Ala Leu		
	885	890
Val Arg Ser Val Arg Val Lys Gly Val Gln Asn Thr Gly Val Met Val		
	900	905
His Asp Gly Lys Gly Ile Ala Asp Asn Ala Thr Met Val Arg Val Asp		
	915	920
Val Tyr Thr Lys Ala Gly Lys Asn Tyr Leu Val Pro Val Tyr Val Trp		
	930	935
Gln Val Ala Gln Gly Ile Leu Pro Asn Arg Ala Val Thr Ser Gly Lys		
945	950	955
Ser Glu Ala Asp Trp Asp Leu Ile Asp Glu Ser Phe Glu Phe Lys Phe		
	965	970
Ser Leu Ser Arg Gly Asp Leu Val Glu Met Ile Ser Asn Lys Gly Arg		
	980	985
Ile Phe Gly Tyr Tyr Asn Gly Leu Asp Arg Ala Asn Gly Ser Ile Gly		
	995	1000
Ile Arg Glu His Asp Leu Glu Lys Ser Lys Gly Lys Asp Gly Val		
	1010	1015
His Arg Val Gly Val Lys Thr Ala Thr Ala Phe Asn Lys Tyr His		
	1025	1030
		1035

Val Asp Pro Leu Gly Lys Glu Ile His Arg Cys Ser Ser Glu Pro
1040 1045 1050

Arg Pro Thr Leu Lys Ile Lys Ser Lys Lys Gly Thr Gly Gly Pro
1055 1060 1065

Lys Lys Lys Arg Lys Val Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
1070 1075 1080

Gly Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Gly Ser Tyr Pro Tyr
1085 1090 1095

Asp Val Pro Asp Tyr Ala Gly Ser Ala Ala Pro Ala Ala Lys Lys
1100 1105 1110

Lys Lys Leu Asp Phe Glu Ser Gly
1115 1120

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<223> n is a, c, g, t or u

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gaaccguugc uacaauaagg ccgucugaaa agaugugccg caacgcucug cccuuuaaag
120

cuucugcuuu aaggggcauc guuuauuu
148

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augaaaaacg uuguuacaau aagagaaaag auuucucgca aagcucuguc ccuugaaaug
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141

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60

uacgagauga gagccguugc uacaauaagg ccgucugaaa agacgcgccg cgacguaaaa
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31

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Ser Gly Phe Gly Glu Thr Asn His Leu Pro Arg Gly Ile Arg Thr Tyr
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Gly Lys Leu
35

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44

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<212> PRT

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<400> 307

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Ile	Gly	Ile	Ala	Ser	Val	Gly	Trp	Ala	Met	Val	Glu	Ile	Asp	Glu	Glu
			20					25					30		

Glu	Asn	Pro	Ile	Arg	Leu	Ile	Asp	Leu	Gly	Val	Arg	Val	Phe	Glu	Arg
		35					40					45			

Ala	Glu	Val	Pro	Lys	Thr	Gly	Asp	Ser	Leu	Ala	Met	Ala	Arg	Arg	Leu
	50					55					60				

Ala	Arg	Ser	Val	Arg	Arg	Leu	Thr	Arg	Arg	Arg	Ala	His	Arg	Leu	Leu
65					70					75				80	

Arg	Thr	Arg	Arg	Leu	Leu	Lys	Arg	Glu	Gly	Val	Leu	Gln	Ala	Ala	Asn
				85					90					95	

Phe	Asp	Glu	Asn	Gly	Leu	Ile	Lys	Ser	Leu	Pro	Asn	Thr	Pro	Trp	Gln
			100					105					110		

Leu	Arg	Ala	Ala	Ala	Leu	Asp	Arg	Lys	Leu	Thr	Pro	Leu	Glu	Trp	Ser
		115					120					125			

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

Lys Asn Glu Gly Glu Thr Ala Asp Lys Glu Leu Gly Ala Leu Leu Lys

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

Lys Ser Pro Leu Asn Leu Ser Pro Glu Leu Gln Asp Glu Ile Gly Thr
370 375 380

Ala Phe Ser Leu Phe Lys Thr Asp Glu Asp Ile Thr Gly Arg Leu Lys
385 390 395 400

Asp Arg Ile Gln Pro Glu Ile Leu Glu Ala Leu Leu Lys His Ile Ser
405 410 415

Phe Asp Lys Phe Val Gln Ile Ser Leu Lys Ala Leu Arg Arg Ile Val
420 425 430

Pro Leu Met Glu Gln Gly Lys Arg Tyr Asp Glu Ala Cys Ala Glu Ile
435 440 445

Tyr Gly Asp His Tyr Gly Lys Lys Asn Thr Glu Glu Lys Ile Tyr Leu
450 455 460

Pro Pro Ile Pro Ala Asp Glu Ile Arg Asn Pro Val Val Leu Arg Ala
465 470 475 480

Leu Ser Gln Ala Arg Lys Val Ile Asn Gly Val Val Arg Arg Tyr Gly
485 490 495

Ser Pro Ala Arg Ile His Ile Glu Thr Ala Arg Glu Val Gly Lys Ser
500 505 510

Phe Lys Asp Arg Lys Glu Ile Glu Lys Arg Gln Glu Glu Asn Arg Lys
515 520 525

Asp Arg Glu Lys Ala Ala Ala Lys Phe Arg Glu Tyr Phe Pro Asn Phe
530 535 540

Val Gly Glu Pro Lys Ser Lys Asp Ile Leu Lys Leu Arg Leu Tyr Glu
545 550 555 560

Gln Gln His Gly Lys Cys Leu Tyr Ser Gly Lys Glu Ile Asn Leu Gly
565 570 575

Arg Leu Asn Glu Lys Gly Tyr Val Glu Ile Asp His Ala Leu Pro Phe

580						585						590					
Ser	Arg	Thr	Trp	Asp	Asp	Ser	Phe	Asn	Asn	Lys	Val	Leu	Val	Leu	Gly		
		595					600					605					
Ser	Glu	Asn	Gln	Asn	Lys	Gly	Asn	Gln	Thr	Pro	Tyr	Glu	Tyr	Phe	Asn		
	610					615					620						
Gly	Lys	Asp	Asn	Ser	Arg	Glu	Trp	Gln	Glu	Phe	Lys	Ala	Arg	Val	Glu		
625					630					635					640		
Thr	Ser	Arg	Phe	Pro	Arg	Ser	Lys	Lys	Gln	Arg	Ile	Leu	Leu	Gln	Lys		
				645					650					655			
Phe	Asp	Glu	Asp	Gly	Phe	Lys	Glu	Arg	Asn	Leu	Asn	Asp	Thr	Arg	Tyr		
			660					665					670				
Val	Asn	Arg	Phe	Leu	Cys	Gln	Phe	Val	Ala	Asp	Arg	Met	Arg	Leu	Thr		
		675					680					685					
Gly	Lys	Gly	Lys	Lys	Arg	Val	Phe	Ala	Ser	Asn	Gly	Gln	Ile	Thr	Asn		
	690					695					700						
Leu	Leu	Arg	Gly	Phe	Trp	Gly	Leu	Arg	Lys	Val	Arg	Ala	Glu	Asn	Asp		
705					710					715					720		
Arg	His	His	Ala	Leu	Asp	Ala	Val	Val	Val	Ala	Cys	Ser	Thr	Val	Ala		
				725					730					735			
Met	Gln	Gln	Lys	Ile	Thr	Arg	Phe	Val	Arg	Tyr	Lys	Glu	Met	Asn	Ala		
			740					745				750					
Phe	Asp	Gly	Lys	Thr	Ile	Asp	Lys	Glu	Thr	Gly	Glu	Val	Leu	His	Gln		
		755				760						765					
Lys	Thr	His	Phe	Pro	Gln	Pro	Trp	Glu	Phe	Phe	Ala	Gln	Glu	Val	Met		
	770					775					780						
Ile	Arg	Val	Phe	Gly	Lys	Pro	Asp	Gly	Lys	Pro	Glu	Phe	Glu	Glu	Ala		
785					790					795					800		

Asp Thr Leu Glu Lys Leu Arg Thr Leu Leu Ala Glu Lys Leu Ser Ser
805 810 815

Arg Pro Glu Ala Val His Glu Tyr Val Thr Pro Leu Phe Val Ser Arg
820 825 830

Ala Pro Asn Arg Lys Met Ser Gly Gln Gly His Met Glu Thr Val Lys
835 840 845

Ser Ala Lys Arg Leu Asp Glu Gly Val Ser Val Leu Arg Val Pro Leu
850 855 860

Thr Gln Leu Lys Leu Lys Asp Leu Glu Lys Met Val Asn Arg Glu Arg
865 870 875 880

Glu Pro Lys Leu Tyr Glu Ala Leu Lys Ala Arg Leu Glu Ala His Lys
885 890 895

Asp Asp Pro Ala Lys Ala Phe Ala Glu Pro Phe Tyr Lys Tyr Asp Lys
900 905 910

Ala Gly Asn Arg Thr Gln Gln Val Lys Ala Val Arg Val Glu Gln Val
915 920 925

Gln Lys Thr Gly Val Trp Val Arg Asn His Asn Gly Ile Ala Asp Asn
930 935 940

Ala Thr Met Val Arg Val Asp Val Phe Glu Lys Gly Asp Lys Tyr Tyr
945 950 955 960

Leu Val Pro Ile Tyr Ser Trp Gln Val Ala Lys Gly Ile Leu Pro Asp
965 970 975

Arg Ala Val Val Gln Gly Lys Asp Glu Glu Asp Trp Gln Leu Ile Asp
980 985 990

Asp Ser Phe Asn Phe Lys Phe Ser Leu His Pro Asn Asp Leu Val Glu
995 1000 1005

Val Ile Thr Lys Lys Ala Arg Met Phe Gly Tyr Phe Ala Ser Cys

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1010                               1015                               1020
His Arg Gly Thr Gly Asn Ile Asn Ile Arg Ile His Asp Leu Asp
1025                               1030                               1035

His Lys Ile Gly Lys Asn Gly Ile Leu Glu Gly Ile Gly Val Lys
1040                               1045                               1050

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

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Ile Gly Ile Ala Ser Val Gly Trp Ala Met Val Glu Ile Asp Glu Glu
20 25 30

Glu Asn Pro Ile Arg Leu Ile Asp Leu Gly Val Arg Val Phe Glu Arg
35 40 45

Ala Glu Val Pro Lys Thr Gly Asp Ser Leu Ala Met Ala Arg Arg Leu
50 55 60

Ala Arg Ser Val Arg Arg Leu Thr Arg Arg Arg Ala His Arg Leu Leu
65 70 75 80

Arg Ala Arg Arg Leu Leu Lys Arg Glu Gly Val Leu Gln Ala Ala Asp
85 90 95

Phe Asp Glu Asn Gly Leu Ile Lys Ser Leu Pro Asn Thr Pro Trp Gln

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	100		105		110										
Leu	Arg	Ala	Ala	Ala	Leu	Asp	Arg	Lys	Leu	Thr	Pro	Leu	Glu	Trp	Ser
		115					120					125			
Ala	Val	Leu	Leu	His	Leu	Ile	Lys	His	Arg	Gly	Tyr	Leu	Ser	Gln	Arg
	130					135					140				
Lys	Asn	Glu	Gly	Glu	Thr	Ala	Asp	Lys	Glu	Leu	Gly	Ala	Leu	Leu	Lys
145					150					155					160
Gly	Val	Ala	Asn	Asn	Ala	His	Ala	Leu	Gln	Thr	Gly	Asp	Phe	Arg	Thr
			165						170					175	
Pro	Ala	Glu	Leu	Ala	Leu	Asn	Lys	Phe	Glu	Lys	Glu	Ser	Gly	His	Ile
			180					185					190		
Arg	Asn	Gln	Arg	Asp	Asp	Tyr	Ser	His	Thr	Phe	Ser	Arg	Lys	Asp	Leu
	195						200					205			
Gln	Ala	Glu	Leu	Ile	Leu	Leu	Phe	Glu	Lys	Gln	Lys	Glu	Phe	Gly	Asn
	210					215					220				
Pro	His	Val	Ser	Gly	Gly	Leu	Lys	Glu	Gly	Ile	Glu	Thr	Leu	Leu	Met
225					230					235					240
Thr	Gln	Arg	Pro	Ala	Leu	Ser	Gly	Asp	Ala	Val	Gln	Lys	Met	Leu	Gly
				245					250					255	
His	Cys	Thr	Phe	Glu	Pro	Ala	Glu	Pro	Lys	Ala	Ala	Lys	Asn	Thr	Tyr
			260					265					270		
Thr	Ala	Glu	Arg	Phe	Ile	Trp	Leu	Thr	Lys	Leu	Asn	Asn	Leu	Arg	Ile
	275						280					285			
Leu	Glu	Gln	Gly	Ser	Glu	Arg	Pro	Leu	Thr	Asp	Thr	Glu	Arg	Ala	Thr
	290					295					300				
Leu	Met	Asp	Glu	Pro	Tyr	Arg	Lys	Ser	Lys	Leu	Thr	Tyr	Ala	Gln	Ala
305					310					315					320

Arg Lys Leu Leu Gly Leu Glu Asp Thr Ala Phe Phe Lys Gly Leu Arg
325 330 335

Tyr Gly Lys Asp Asn Ala Glu Ala Ser Thr Leu Met Glu Met Lys Ala
340 345 350

Tyr His Ala Ile Ser Arg Ala Leu Glu Lys Glu Gly Leu Lys Asp Lys
355 360 365

Lys Ser Pro Leu Asn Leu Ser Ser Glu Leu Gln Asp Glu Ile Gly Thr
370 375 380

Ala Phe Ser Leu Phe Lys Thr Asp Glu Asp Ile Thr Gly Arg Leu Lys
385 390 395 400

Asp Arg Val Gln Pro Glu Ile Leu Glu Ala Leu Leu Lys His Ile Ser
405 410 415

Phe Asp Lys Phe Val Gln Ile Ser Leu Lys Ala Leu Arg Arg Ile Val
420 425 430

Pro Leu Met Glu Gln Gly Lys Arg Tyr Asp Glu Ala Cys Ala Glu Ile
435 440 445

Tyr Gly Asp His Tyr Gly Lys Lys Asn Thr Glu Glu Lys Ile Tyr Leu
450 455 460

Pro Pro Ile Pro Ala Asp Glu Ile Arg Asn Pro Val Val Leu Arg Ala
465 470 475 480

Leu Ser Gln Ala Arg Lys Val Ile Asn Gly Val Val Arg Arg Tyr Gly
485 490 495

Ser Pro Ala Arg Ile His Ile Glu Thr Ala Arg Glu Val Gly Lys Ser
500 505 510

Phe Lys Asp Arg Lys Glu Ile Glu Lys Arg Gln Glu Glu Asn Arg Lys
515 520 525

Asp Arg Glu Lys Ala Ala Ala Lys Phe Arg Glu Tyr Phe Pro Asn Phe

530						535						540				
Val	Gly	Glu	Pro	Lys	Ser	Lys	Asp	Ile	Leu	Lys	Leu	Arg	Leu	Tyr	Glu	
545					550					555					560	
Gln	Gln	His	Gly	Lys	Cys	Leu	Tyr	Ser	Gly	Lys	Glu	Ile	Asn	Leu	Val	
				565					570					575		
Arg	Leu	Asn	Glu	Lys	Gly	Tyr	Val	Glu	Ile	Asp	His	Ala	Leu	Pro	Phe	
			580					585					590			
Ser	Arg	Thr	Trp	Asp	Asp	Ser	Phe	Asn	Asn	Lys	Val	Leu	Val	Leu	Gly	
		595					600					605				
Ser	Glu	Asn	Gln	Asn	Lys	Gly	Asn	Gln	Thr	Pro	Tyr	Glu	Tyr	Phe	Asn	
	610					615					620					
Gly	Lys	Asp	Asn	Ser	Arg	Glu	Trp	Gln	Glu	Phe	Lys	Ala	Arg	Val	Glu	
625					630					635					640	
Thr	Ser	Arg	Phe	Pro	Arg	Ser	Lys	Lys	Gln	Arg	Ile	Leu	Leu	Gln	Lys	
				645					650					655		
Phe	Asp	Glu	Asp	Gly	Phe	Lys	Glu	Cys	Asn	Leu	Asn	Asp	Thr	Arg	Tyr	
			660					665					670			
Val	Asn	Arg	Phe	Leu	Cys	Gln	Phe	Val	Ala	Asp	His	Ile	Leu	Leu	Thr	
		675					680					685				
Gly	Lys	Gly	Lys	Arg	Arg	Val	Phe	Ala	Ser	Asn	Gly	Gln	Ile	Thr	Asn	
	690					695					700					
Leu	Leu	Arg	Gly	Phe	Trp	Gly	Leu	Arg	Lys	Val	Arg	Ala	Glu	Asn	Asp	
705					710					715					720	
Arg	His	His	Ala	Leu	Asp	Ala	Val	Val	Val	Ala	Cys	Ser	Thr	Val	Ala	
				725					730					735		
Met	Gln	Gln	Lys	Ile	Thr	Arg	Phe	Val	Arg	Tyr	Lys	Glu	Met	Asn	Ala	
			740					745					750			

Phe Asp Gly Lys Thr Ile Asp Lys Glu Thr Gly Lys Val Leu His Gln
755 760 765

Lys Thr His Phe Pro Gln Pro Trp Glu Phe Phe Ala Gln Glu Val Met
770 775 780

Ile Arg Val Phe Gly Lys Pro Asp Gly Lys Pro Glu Phe Glu Glu Ala
785 790 795 800

Asp Thr Pro Glu Lys Leu Arg Thr Leu Leu Ala Glu Lys Leu Ser Ser
805 810 815

Arg Pro Glu Ala Val His Glu Tyr Val Thr Pro Leu Phe Val Ser Arg
820 825 830

Ala Pro Asn Arg Lys Met Ser Gly Ala His Lys Asp Thr Leu Arg Ser
835 840 845

Ala Lys Arg Phe Val Lys His Asn Glu Lys Ile Ser Val Lys Arg Val
850 855 860

Trp Leu Thr Glu Ile Lys Leu Ala Asp Leu Glu Asn Met Val Asn Tyr
865 870 875 880

Lys Asn Gly Arg Glu Ile Glu Leu Tyr Glu Ala Leu Lys Ala Arg Leu
885 890 895

Glu Ala Tyr Gly Gly Asn Ala Lys Gln Ala Phe Asp Pro Lys Asp Asn
900 905 910

Pro Phe Tyr Lys Lys Gly Gly Gln Leu Val Lys Ala Val Arg Val Glu
915 920 925

Lys Thr Gln Glu Ser Gly Val Leu Leu Asn Lys Lys Asn Ala Tyr Thr
930 935 940

Ile Ala Asp Asn Gly Asp Met Val Arg Val Asp Val Phe Cys Lys Val
945 950 955 960

Asp Lys Lys Gly Lys Asn Gln Tyr Phe Ile Val Pro Ile Tyr Ala Trp

	965		970		975
Gln Val Ala Glu Asn Ile Leu Pro Asp Ile Asp Cys Lys Gly Tyr Arg					
	980		985		990
Ile Asp Asp Ser Tyr Thr Phe Cys Phe Ser Leu His Lys Tyr Asp Leu					
	995		1000		1005
Ile Ala Phe Gln Lys Asp Glu Lys Ser Lys Val Glu Phe Ala Tyr					
	1010		1015		1020
Tyr Ile Asn Cys Asp Ser Ser Asn Gly Arg Phe Tyr Leu Ala Trp					
	1025		1030		1035
His Asp Lys Gly Ser Lys Glu Gln Gln Phe Arg Ile Ser Thr Gln					
	1040		1045		1050
Asn Leu Val Leu Ile Gln Lys Tyr Gln Val Asn Glu Leu Gly Lys					
	1055		1060		1065
Glu Ile Arg Pro Cys Arg Leu Lys Lys Arg Pro Pro Val Arg					
	1070		1075		1080
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Met Ala Ala Phe Lys Pro Asn Ser Ile Asn Tyr Ile Leu Gly Leu Asp					
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Ile Gly Ile Ala Ser Val Gly Trp Ala Met Val Glu Ile Asp Glu Glu					
	20		25		30
Glu Asn Pro Ile Arg Leu Ile Asp Leu Gly Val Arg Val Phe Glu Arg					
	35		40		45
Ala Glu Val Pro Lys Thr Gly Asp Ser Leu Ala Met Ala Arg Arg Leu					

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

Thr Ala Glu Arg Phe Ile Trp Leu Thr Lys Leu Asn Asn Leu Arg Ile
275 280 285

Leu Glu Gln Gly Ser Glu Arg Pro Leu Thr Asp Thr Glu Arg Ala Thr
290 295 300

Leu Met Asp Glu Pro Tyr Arg Lys Ser Lys Leu Thr Tyr Ala Gln Ala
305 310 315 320

Arg Lys Leu Leu Gly Leu Glu Asp Thr Ala Phe Phe Lys Gly Leu Arg
325 330 335

Tyr Gly Lys Asp Asn Ala Glu Ala Ser Thr Leu Met Glu Met Lys Ala
340 345 350

Tyr His Ala Ile Ser Arg Ala Leu Glu Lys Glu Gly Leu Lys Asp Lys
355 360 365

Lys Ser Pro Leu Asn Leu Ser Pro Glu Leu Gln Asp Glu Ile Gly Thr
370 375 380

Ala Phe Ser Leu Phe Lys Thr Asp Glu Asp Ile Thr Gly Arg Leu Lys
385 390 395 400

Asp Arg Ile Gln Pro Glu Ile Leu Glu Ala Leu Leu Lys His Ile Ser
405 410 415

Phe Asp Lys Phe Val Gln Ile Ser Leu Lys Ala Leu Arg Arg Ile Val
420 425 430

Pro Leu Met Glu Gln Gly Lys Arg Tyr Asp Glu Ala Cys Ala Glu Ile
435 440 445

Tyr Gly Asp His Tyr Gly Lys Lys Asn Thr Glu Glu Lys Ile Tyr Leu
450 455 460

Pro Pro Ile Pro Ala Asp Glu Ile Arg Asn Pro Val Val Leu Arg Ala
465 470 475 480

Leu Ser Gln Ala Arg Lys Val Ile Asn Gly Val Val Arg Arg Tyr Gly

				485						490						495
Ser	Pro	Ala	Arg	Ile	His	Ile	Glu	Thr	Ala	Arg	Glu	Val	Gly	Lys	Ser	
			500					505					510			
Phe	Lys	Asp	Arg	Lys	Glu	Ile	Glu	Lys	Arg	Gln	Glu	Glu	Asn	Arg	Lys	
		515					520					525				
Asp	Arg	Glu	Lys	Ala	Ala	Ala	Lys	Phe	Arg	Glu	Tyr	Phe	Pro	Asn	Phe	
	530					535					540					
Val	Gly	Glu	Pro	Lys	Ser	Lys	Asp	Ile	Leu	Lys	Leu	Arg	Leu	Tyr	Glu	
545					550					555					560	
Gln	Gln	His	Gly	Lys	Cys	Leu	Tyr	Ser	Gly	Lys	Glu	Ile	Asn	Leu	Gly	
				565					570					575		
Arg	Leu	Asn	Glu	Lys	Gly	Tyr	Val	Glu	Ile	Asp	His	Ala	Leu	Pro	Phe	
			580					585					590			
Ser	Arg	Thr	Trp	Asp	Asp	Ser	Phe	Asn	Asn	Lys	Val	Leu	Val	Leu	Gly	
		595					600					605				
Ser	Glu	Asn	Gln	Asn	Lys	Gly	Asn	Gln	Thr	Pro	Tyr	Glu	Tyr	Phe	Asn	
	610					615					620					
Gly	Lys	Asp	Asn	Ser	Arg	Glu	Trp	Gln	Glu	Phe	Lys	Ala	Arg	Val	Glu	
625					630					635					640	
Thr	Ser	Arg	Phe	Pro	Arg	Ser	Lys	Lys	Gln	Arg	Ile	Leu	Leu	Gln	Lys	
				645					650					655		
Phe	Asp	Glu	Asp	Gly	Phe	Lys	Glu	Arg	Asn	Leu	Asn	Asp	Thr	Arg	Tyr	
			660					665					670			
Val	Asn	Arg	Phe	Leu	Cys	Gln	Phe	Val	Ala	Asp	Arg	Met	Arg	Leu	Thr	
		675					680					685				
Gly	Lys	Gly	Lys	Lys	Arg	Val	Phe	Ala	Ser	Asn	Gly	Gln	Ile	Thr	Asn	
	690					695					700					

Leu Leu Arg Gly Phe Trp Gly Leu Arg Lys Val Arg Ala Glu Asn Asp
705 710 715 720

Arg His His Ala Leu Asp Ala Val Val Val Ala Cys Ser Thr Val Ala
725 730 735

Met Gln Gln Lys Ile Thr Arg Phe Val Arg Tyr Lys Glu Met Asn Ala
740 745 750

Phe Asp Gly Lys Thr Ile Asp Lys Glu Thr Gly Glu Val Leu His Gln
755 760 765

Lys Thr His Phe Pro Gln Pro Trp Glu Phe Phe Ala Gln Glu Val Met
770 775 780

Ile Arg Val Phe Gly Lys Pro Asp Gly Lys Pro Glu Phe Glu Glu Ala
785 790 795 800

Asp Thr Leu Glu Lys Leu Arg Thr Leu Leu Ala Glu Lys Leu Ser Ser
805 810 815

Arg Pro Glu Ala Val His Glu Tyr Val Thr Pro Leu Phe Val Ser Arg
820 825 830

Ala Pro Asn Arg Lys Met Ser Gly Gln Gly His Met Glu Thr Val Lys
835 840 845

Ser Ala Lys Arg Leu Asp Glu Gly Val Ser Val Leu Arg Val Pro Leu
850 855 860

Thr Gln Leu Lys Leu Lys Asp Leu Glu Lys Met Val Asn Arg Glu Arg
865 870 875 880

Glu Pro Lys Leu Tyr Glu Ala Leu Lys Ala Arg Leu Glu Ala His Lys
885 890 895

Asp Asp Pro Ala Lys Ala Phe Ala Glu Pro Phe Tyr Lys Tyr Asp Lys
900 905 910

Ala Gly Asn Arg Thr Gln Gln Val Lys Ala Val Arg Val Glu Gln Val

915								920								925
Gln	Lys	Thr	Gly	Val	Trp	Val	Arg	Asn	His	Asn	Gly	Ile	Ala	Asp	Asn	
930						935					940					
Ala	Thr	Met	Val	Arg	Val	Asp	Val	Phe	Glu	Lys	Gly	Asp	Lys	Tyr	Tyr	
945					950					955					960	
Leu	Val	Pro	Ile	Tyr	Ser	Trp	Gln	Val	Ala	Lys	Gly	Ile	Leu	Pro	Asp	
			965						970					975		
Arg	Ala	Val	Val	Gln	Gly	Lys	Asp	Glu	Glu	Asp	Trp	Gln	Leu	Ile	Asp	
			980					985					990			
Asp	Ser	Phe	Asn	Phe	Lys	Phe	Ser	Leu	His	Pro	Asn	Asp	Leu	Val	Glu	
	995						1000					1005				
Val	Ile	Thr	Lys	Lys	Ala	Arg	Met	Phe	Gly	Tyr	Phe	Ala	Ser	Cys		
1010						1015					1020					
His	Arg	Gly	Thr	Gly	Asn	Ile	Asn	Ile	Arg	Ile	His	Asp	Leu	Asp		
1025						1030					1035					
His	Lys	Ile	Gly	Lys	Asn	Gly	Ile	Leu	Glu	Gly	Ile	Gly	Val	Lys		
1040						1045					1050					
Thr	Ala	Leu	Ser	Phe	Gln	Lys	Tyr	Gln	Ile	Asp	Glu	Leu	Gly	Lys		
1055						1060					1065					
Glu	Ile	Arg	Pro	Cys	Arg	Leu	Lys	Lys	Arg	Pro	Pro	Val	Arg			
1070						1075					1080					

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<220>
 <223> Synthetic

<400> 310

Met Ala Ala Phe Lys Pro Asn Pro Ile Asn Tyr Ile Leu Gly Leu Asp

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

Pro His Val Ser Gly Gly Leu Lys Glu Gly Ile Glu Thr Leu Leu Met
225 230 235 240

Thr Gln Arg Pro Ala Leu Ser Gly Asp Ala Val Gln Lys Met Leu Gly
245 250 255

His Cys Thr Phe Glu Pro Ala Glu Pro Lys Ala Ala Lys Asn Thr Tyr
260 265 270

Thr Ala Glu Arg Phe Ile Trp Leu Thr Lys Leu Asn Asn Leu Arg Ile
275 280 285

Leu Glu Gln Gly Ser Glu Arg Pro Leu Thr Asp Thr Glu Arg Ala Thr
290 295 300

Leu Met Asp Glu Pro Tyr Arg Lys Ser Lys Leu Thr Tyr Ala Gln Ala
305 310 315 320

Arg Lys Leu Leu Ser Leu Glu Asp Thr Ala Phe Phe Lys Gly Leu Arg
325 330 335

Tyr Gly Lys Asp Asn Ala Glu Ala Ser Thr Leu Met Glu Met Lys Ala
340 345 350

Tyr His Thr Ile Ser Arg Ala Leu Glu Lys Glu Gly Leu Lys Asp Lys
355 360 365

Lys Ser Pro Leu Asn Leu Ser Pro Glu Leu Gln Asp Glu Ile Gly Thr
370 375 380

Ala Phe Ser Leu Phe Lys Thr Asp Glu Asp Ile Thr Gly Arg Leu Lys
385 390 395 400

Asp Arg Ile Gln Pro Glu Ile Leu Glu Ala Leu Leu Lys His Ile Ser
405 410 415

Phe Asp Lys Phe Val Gln Ile Ser Leu Lys Ala Leu Arg Arg Ile Val
420 425 430

Pro Leu Met Glu Gln Gly Lys Arg Tyr Asp Glu Ala Cys Ala Glu Ile

435								440								445
Tyr	Gly	Asp	His	Tyr	Gly	Lys	Lys	Asn	Thr	Glu	Glu	Lys	Ile	Tyr	Leu	
	450					455						460				
Pro	Pro	Ile	Pro	Ala	Asp	Glu	Ile	Arg	Asn	Pro	Val	Val	Leu	Arg	Ala	
465					470					475					480	
Leu	Ser	Gln	Ala	Arg	Lys	Val	Ile	Asn	Gly	Val	Val	Arg	Arg	Tyr	Gly	
				485					490					495		
Ser	Pro	Ala	Arg	Ile	His	Ile	Glu	Thr	Ala	Arg	Glu	Val	Gly	Lys	Ser	
			500					505					510			
Phe	Lys	Asp	Arg	Lys	Glu	Ile	Glu	Lys	Arg	Gln	Glu	Glu	Asn	Arg	Lys	
		515					520					525				
Asp	Arg	Glu	Lys	Ala	Ala	Ala	Lys	Phe	Arg	Glu	Tyr	Phe	Pro	Asn	Phe	
	530					535					540					
Val	Gly	Glu	Pro	Lys	Ser	Lys	Asp	Ile	Leu	Lys	Leu	Arg	Leu	Tyr	Glu	
545					550					555					560	
Gln	Gln	His	Gly	Lys	Cys	Leu	Tyr	Ser	Gly	Lys	Glu	Ile	Asn	Leu	Gly	
				565					570					575		
Arg	Leu	Asn	Glu	Lys	Gly	Tyr	Val	Glu	Ile	Asp	His	Ala	Leu	Pro	Phe	
			580					585					590			
Ser	Arg	Thr	Trp	Asp	Asp	Ser	Phe	Asn	Asn	Lys	Val	Leu	Val	Leu	Gly	
		595					600					605				
Ser	Glu	Asn	Gln	Asn	Lys	Gly	Asn	Gln	Thr	Pro	Tyr	Glu	Tyr	Phe	Asn	
	610					615					620					
Gly	Lys	Asp	Asn	Ser	Arg	Glu	Trp	Gln	Glu	Phe	Lys	Ala	Arg	Val	Glu	
625					630					635					640	
Thr	Ser	Arg	Phe	Pro	Arg	Ser	Lys	Lys	Gln	Arg	Ile	Leu	Leu	Gln	Lys	
				645					650					655		

Phe Asp Glu Asp Gly Phe Lys Glu Arg Asn Leu Asn Asp Thr Arg Tyr
660 665 670

Val Asn Arg Phe Leu Cys Gln Phe Val Ala Asp Arg Met Arg Leu Thr
675 680 685

Gly Lys Gly Lys Lys Arg Val Phe Ala Ser Asn Gly Gln Ile Thr Asn
690 695 700

Leu Leu Arg Gly Phe Trp Gly Leu Arg Lys Val Arg Ala Glu Asn Asp
705 710 715 720

Arg His His Ala Leu Asp Ala Val Val Val Ala Cys Ser Thr Val Ala
725 730 735

Met Gln Gln Lys Ile Thr Arg Phe Val Arg Tyr Lys Glu Met Asn Ala
740 745 750

Phe Asp Gly Lys Thr Ile Asp Lys Glu Thr Gly Glu Val Leu His Gln
755 760 765

Lys Thr His Phe Pro Gln Pro Trp Glu Phe Phe Ala Gln Glu Val Met
770 775 780

Ile Arg Val Phe Gly Lys Pro Asp Gly Lys Pro Glu Phe Glu Glu Ala
785 790 795 800

Asp Thr Pro Glu Lys Leu Arg Thr Leu Leu Ala Glu Lys Leu Ser Ser
805 810 815

Arg Pro Glu Ala Val His Glu Tyr Val Thr Pro Leu Phe Val Ser Arg
820 825 830

Ala Pro Asn Arg Lys Met Ser Gly Gln Gly His Met Glu Thr Val Lys
835 840 845

Ser Ala Lys Arg Leu Asp Glu Gly Val Ser Val Leu Arg Val Pro Leu
850 855 860

Thr Gln Leu Lys Leu Lys Asp Leu Glu Lys Met Val Asn Arg Glu Arg

865		870		875		880									
Glu	Pro	Lys	Leu	Tyr	Glu	Ala	Leu	Lys	Ala	Arg	Leu	Glu	Ala	His	Lys
			885						890					895	
Asp	Asp	Pro	Ala	Lys	Ala	Phe	Ala	Glu	Pro	Phe	Tyr	Lys	Tyr	Asp	Lys
			900					905					910		
Ala	Gly	Asn	Arg	Thr	Gln	Gln	Val	Lys	Ala	Val	Arg	Val	Glu	Gln	Val
		915					920					925			
Gln	Lys	Thr	Gly	Val	Trp	Val	Arg	Asn	His	Asn	Gly	Ile	Ala	Asp	Asn
	930					935					940				
Ala	Thr	Met	Val	Arg	Val	Asp	Val	Phe	Glu	Lys	Gly	Asp	Lys	Tyr	Tyr
945					950					955					960
Leu	Val	Pro	Ile	Tyr	Ser	Trp	Gln	Val	Ala	Lys	Gly	Ile	Leu	Pro	Asp
			965						970					975	
Arg	Ala	Val	Val	Ala	Tyr	Ala	Asp	Glu	Glu	Asp	Trp	Thr	Val	Ile	Asp
			980					985					990		
Glu	Ser	Phe	Arg	Phe	Lys	Phe	Val	Leu	Tyr	Ser	Asn	Asp	Leu	Ile	Lys
		995					1000					1005			
Val	Gln	Leu	Lys	Lys	Asp	Ser	Phe	Leu	Gly	Tyr	Phe	Ser	Gly	Leu	
	1010					1015					1020				
Asp	Arg	Ala	Thr	Gly	Ala	Ile	Ser	Leu	Arg	Glu	His	Asp	Leu	Glu	
	1025					1030					1035				
Lys	Ser	Lys	Gly	Lys	Asp	Gly	Met	His	Arg	Ile	Gly	Val	Lys	Thr	
	1040					1045					1050				
Ala	Leu	Ser	Phe	Gln	Lys	Tyr	Gln	Ile	Asp	Glu	Met	Gly	Lys	Glu	
	1055					1060					1065				
Ile	Arg	Pro	Cys	Arg	Leu	Lys	Lys	Arg	Pro	Pro	Val	Arg			
	1070					1075					1080				

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<220>
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Met Ala Ala Phe Lys Pro Asn Pro Ile Asn Tyr Ile Leu Gly Leu Asp
1 5 10 15

Ile Gly Ile Ala Ser Val Gly Trp Ala Met Val Glu Ile Asp Glu Glu
20 25 30

Glu Asn Pro Ile Arg Leu Ile Asp Leu Gly Val Arg Val Phe Glu Arg
35 40 45

Ala Glu Val Pro Lys Thr Gly Asp Ser Leu Ala Met Ala Arg Arg Leu
50 55 60

Ala Arg Ser Val Arg Arg Leu Thr Arg Arg Arg Ala His Arg Leu Leu
65 70 75 80

Arg Ala Arg Arg Leu Leu Lys Arg Glu Gly Val Leu Gln Ala Ala Asp
85 90 95

Phe Asp Glu Asn Gly Leu Ile Lys Ser Leu Pro Asn Thr Pro Trp Gln
100 105 110

Leu Arg Ala Ala Ala Leu Asp Arg Lys Leu Thr Pro Leu Glu Trp Ser
115 120 125

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

Lys Asn Glu Gly Glu Thr Ala Asp Lys Glu Leu Gly Ala Leu Leu Lys
145 150 155 160

Gly Val Ala Asn Asn Ala His Ala Leu Gln Thr Gly Asp Phe Arg Thr
165 170 175

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

385					390						395				400
Asp	Arg	Val	Gln	Pro	Glu	Ile	Leu	Glu	Ala	Leu	Leu	Lys	His	Ile	Ser
				405					410					415	
Phe	Asp	Lys	Phe	Val	Gln	Ile	Ser	Leu	Lys	Ala	Leu	Arg	Arg	Ile	Val
			420					425					430		
Pro	Leu	Met	Glu	Gln	Gly	Lys	Arg	Tyr	Asp	Glu	Ala	Cys	Ala	Glu	Ile
		435					440					445			
Tyr	Gly	Asp	His	Tyr	Gly	Lys	Lys	Asn	Thr	Glu	Glu	Lys	Ile	Tyr	Leu
	450					455					460				
Pro	Pro	Ile	Pro	Ala	Asp	Glu	Ile	Arg	Asn	Pro	Val	Val	Leu	Arg	Ala
465					470					475					480
Leu	Ser	Gln	Ala	Arg	Lys	Val	Ile	Asn	Gly	Val	Val	Arg	Arg	Tyr	Gly
				485					490					495	
Ser	Pro	Ala	Arg	Ile	His	Ile	Glu	Thr	Ala	Arg	Glu	Val	Gly	Lys	Ser
			500					505					510		
Phe	Lys	Asp	Arg	Lys	Glu	Ile	Glu	Lys	Arg	Gln	Glu	Glu	Asn	Arg	Lys
		515					520					525			
Asp	Arg	Glu	Lys	Ala	Ala	Ala	Lys	Phe	Arg	Glu	Tyr	Phe	Pro	Asn	Phe
		530				535					540				
Val	Gly	Glu	Pro	Lys	Ser	Lys	Asp	Ile	Leu	Lys	Leu	Arg	Leu	Tyr	Glu
545					550					555					560
Gln	Gln	His	Gly	Lys	Cys	Leu	Tyr	Ser	Gly	Lys	Glu	Ile	Asn	Leu	Val
				565					570					575	
Arg	Leu	Asn	Glu	Lys	Gly	Tyr	Val	Glu	Ile	Asp	His	Ala	Leu	Pro	Phe
			580					585					590		
Ser	Arg	Thr	Trp	Asp	Asp	Ser	Phe	Asn	Asn	Lys	Val	Leu	Val	Leu	Gly
		595					600					605			

Ser Glu Asn Gln Asn Lys Gly Asn Gln Thr Pro Tyr Glu Tyr Phe Asn
610 615 620

Gly Lys Asp Asn Ser Arg Glu Trp Gln Glu Phe Lys Ala Arg Val Glu
625 630 635 640

Thr Ser Arg Phe Pro Arg Ser Lys Lys Gln Arg Ile Leu Leu Gln Lys
645 650 655

Phe Asp Glu Asp Gly Phe Lys Glu Cys Asn Leu Asn Asp Thr Arg Tyr
660 665 670

Val Asn Arg Phe Leu Cys Gln Phe Val Ala Asp His Ile Leu Leu Thr
675 680 685

Gly Lys Gly Lys Arg Arg Val Phe Ala Ser Asn Gly Gln Ile Thr Asn
690 695 700

Leu Leu Arg Gly Phe Trp Gly Leu Arg Lys Val Arg Ala Glu Asn Asp
705 710 715 720

Arg His His Ala Leu Asp Ala Val Val Val Ala Cys Ser Thr Val Ala
725 730 735

Met Gln Gln Lys Ile Thr Arg Phe Val Arg Tyr Lys Glu Met Asn Ala
740 745 750

Phe Asp Gly Lys Thr Ile Asp Lys Glu Thr Gly Lys Val Leu His Gln
755 760 765

Lys Thr His Phe Pro Gln Pro Trp Glu Phe Phe Ala Gln Glu Val Met
770 775 780

Ile Arg Val Phe Gly Lys Pro Asp Gly Lys Pro Glu Phe Glu Glu Ala
785 790 795 800

Asp Thr Pro Glu Lys Leu Arg Thr Leu Leu Ala Glu Lys Leu Ser Ser
805 810 815

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

	820		825		830														
Ala	Pro	Asn	Arg	Lys	Met	Ser	Gly	Ala	His	Lys	Asp	Thr	Leu	Arg	Ser				
		835					840					845							
Ala	Lys	Arg	Phe	Val	Lys	His	Asn	Glu	Lys	Ile	Ser	Val	Lys	Arg	Val				
	850					855					860								
Trp	Leu	Thr	Glu	Ile	Lys	Leu	Ala	Asp	Leu	Glu	Asn	Met	Val	Asn	Tyr				
865					870					875					880				
Lys	Asn	Gly	Arg	Glu	Ile	Glu	Leu	Tyr	Glu	Ala	Leu	Lys	Ala	Arg	Leu				
				885					890					895					
Glu	Ala	Tyr	Gly	Gly	Asn	Ala	Lys	Gln	Ala	Phe	Asp	Pro	Lys	Asp	Asn				
			900					905					910						
Pro	Phe	Tyr	Lys	Lys	Gly	Gly	Gln	Leu	Val	Lys	Ala	Val	Arg	Val	Glu				
		915					920					925							
Lys	Thr	Gln	Glu	Ser	Gly	Val	Leu	Leu	Asn	Lys	Lys	Asn	Ala	Tyr	Thr				
	930					935					940								
Ile	Ala	Asp	Asn	Gly	Asp	Met	Val	Arg	Val	Asp	Val	Phe	Cys	Lys	Val				
945						950				955					960				
Asp	Lys	Lys	Gly	Lys	Asn	Gln	Tyr	Phe	Ile	Val	Pro	Ile	Tyr	Ala	Trp				
				965					970					975					
Gln	Val	Ala	Glu	Asn	Ile	Leu	Pro	Asp	Ile	Asp	Cys	Lys	Gly	Tyr	Arg				
			980					985					990						
Ile	Asp	Asp	Ser	Tyr	Thr	Phe	Cys	Phe	Ser	Leu	His	Lys	Tyr	Asp	Leu				
		995					1000					1005							
Ile	Ala	Phe	Gln	Lys	Asp	Glu	Lys	Ser	Lys	Val	Glu	Phe	Ala	Tyr					
	1010					1015					1020								
Tyr	Ile	Asn	Cys	Asp	Ser	Ser	Asn	Gly	Arg	Phe	Tyr	Leu	Ala	Trp					
	1025					1030					1035								

His Asp Lys Gly Ser Lys Glu Gln Gln Phe Arg Ile Ser Thr Gln
1040 1045 1050

Asn Leu Val Leu Ile Gln Lys Tyr Gln Val Asn Glu Leu Gly Lys
1055 1060 1065

Glu Ile Arg Pro Cys Arg Leu Lys Lys Arg Pro Pro Val Arg Gly
1070 1075 1080

Thr Gly Gly Pro Lys Lys Lys Arg Lys Val Tyr Pro Tyr Asp Val
1085 1090 1095

Pro Asp Tyr Ala Gly Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Gly
1100 1105 1110

Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Gly Ser Ala Ala Pro
1115 1120 1125

Ala Ala Lys Lys Lys Lys Leu Asp Phe Glu Ser Gly
1130 1135 1140

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

Val Gly Trp Ala Met Val Glu Ile Asp Glu Glu Glu Asn Pro Ile Arg
50 55 60

Leu Ile Asp Leu Gly Val Arg Val Phe Glu Arg Ala Glu Val Pro Lys
65 70 75 80

Thr Gly Asp Ser Leu Ala Met Ala Arg Arg Leu Ala Arg Ser Val Arg
85 90 95

Arg Leu Thr Arg Arg Arg Ala His Arg Leu Leu Arg Ala Arg Arg Leu
100 105 110

Leu Lys Arg Glu Gly Val Leu Gln Ala Ala Asp Phe Asp Glu Asn Gly
115 120 125

Leu Ile Lys Ser Leu Pro Asn Thr Pro Trp Gln Leu Arg Ala Ala Ala
130 135 140

Leu Asp Arg Lys Leu Thr Pro Leu Glu Trp Ser Ala Val Leu Leu His
145 150 155 160

Leu Ile Lys His Arg Gly Tyr Leu Ser Gln Arg Lys Asn Glu Gly Glu
165 170 175

Thr Ala Asp Lys Glu Leu Gly Ala Leu Leu Lys Gly Val Ala Asn Asn
180 185 190

Ala His Ala Leu Gln Thr Gly Asp Phe Arg Thr Pro Ala Glu Leu Ala
195 200 205

Leu Asn Lys Phe Glu Lys Glu Ser Gly His Ile Arg Asn Gln Arg Gly
210 215 220

Asp Tyr Ser His Thr Phe Ser Arg Lys Asp Leu Gln Ala Glu Leu Ile
225 230 235 240

Leu Leu Phe Glu Lys Gln Lys Glu Phe Gly Asn Pro His Val Ser Gly
245 250 255

Gly Leu Lys Glu Gly Ile Glu Thr Leu Leu Met Thr Gln Arg Pro Ala
260 265 270

Leu Ser Gly Asp Ala Val Gln Lys Met Leu Gly His Cys Thr Phe Glu

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

Asp Glu Ile Arg Asn Pro Val Val Leu Arg Ala Leu Ser Gln Ala Arg
500 505 510

Lys Val Ile Asn Gly Val Val Arg Arg Tyr Gly Ser Pro Ala Arg Ile
515 520 525

His Ile Glu Thr Ala Arg Glu Val Gly Lys Ser Phe Lys Asp Arg Lys
530 535 540

Glu Ile Glu Lys Arg Gln Glu Glu Asn Arg Lys Asp Arg Glu Lys Ala
545 550 555 560

Ala Ala Lys Phe Arg Glu Tyr Phe Pro Asn Phe Val Gly Glu Pro Lys
565 570 575

Ser Lys Asp Ile Leu Lys Leu Arg Leu Tyr Glu Gln Gln His Gly Lys
580 585 590

Cys Leu Tyr Ser Gly Lys Glu Ile Asn Leu Val Arg Leu Asn Glu Lys
595 600 605

Gly Tyr Val Glu Ile Asp His Ala Leu Pro Phe Ser Arg Thr Trp Asp
610 615 620

Asp Ser Phe Asn Asn Lys Val Leu Val Leu Gly Ser Glu Asn Gln Asn
625 630 635 640

Lys Gly Asn Gln Thr Pro Tyr Glu Tyr Phe Asn Gly Lys Asp Asn Ser
645 650 655

Arg Glu Trp Gln Glu Phe Lys Ala Arg Val Glu Thr Ser Arg Phe Pro
660 665 670

Arg Ser Lys Lys Gln Arg Ile Leu Leu Gln Lys Phe Asp Glu Asp Gly
675 680 685

Phe Lys Glu Cys Asn Leu Asn Asp Thr Arg Tyr Val Asn Arg Phe Leu
690 695 700

Cys Gln Phe Val Ala Asp His Ile Leu Leu Thr Gly Lys Gly Lys Arg

705					710					715					720
Arg	Val	Phe	Ala	Ser	Asn	Gly	Gln	Ile	Thr	Asn	Leu	Leu	Arg	Gly	Phe
				725					730					735	
Trp	Gly	Leu	Arg	Lys	Val	Arg	Ala	Glu	Asn	Asp	Arg	His	His	Ala	Leu
			740					745					750		
Asp	Ala	Val	Val	Val	Ala	Cys	Ser	Thr	Val	Ala	Met	Gln	Gln	Lys	Ile
		755					760					765			
Thr	Arg	Phe	Val	Arg	Tyr	Lys	Glu	Met	Asn	Ala	Phe	Asp	Gly	Lys	Thr
	770					775					780				
Ile	Asp	Lys	Glu	Thr	Gly	Lys	Val	Leu	His	Gln	Lys	Thr	His	Phe	Pro
785					790					795					800
Gln	Pro	Trp	Glu	Phe	Phe	Ala	Gln	Glu	Val	Met	Ile	Arg	Val	Phe	Gly
				805					810					815	
Lys	Pro	Asp	Gly	Lys	Pro	Glu	Phe	Glu	Glu	Ala	Asp	Thr	Pro	Glu	Lys
			820					825					830		
Leu	Arg	Thr	Leu	Leu	Ala	Glu	Lys	Leu	Ser	Ser	Arg	Pro	Glu	Ala	Val
		835					840					845			
His	Glu	Tyr	Val	Thr	Pro	Leu	Phe	Val	Ser	Arg	Ala	Pro	Asn	Arg	Lys
	850					855					860				
Met	Ser	Gly	Ala	His	Lys	Asp	Thr	Leu	Arg	Ser	Ala	Lys	Arg	Phe	Val
865					870					875					880
Lys	His	Asn	Glu	Lys	Ile	Ser	Val	Lys	Arg	Val	Trp	Leu	Thr	Glu	Ile
				885					890					895	
Lys	Leu	Ala	Asp	Leu	Glu	Asn	Met	Val	Asn	Tyr	Lys	Asn	Gly	Arg	Glu
			900					905					910		
Ile	Glu	Leu	Tyr	Glu	Ala	Leu	Lys	Ala	Arg	Leu	Glu	Ala	Tyr	Gly	Gly
		915					920					925			

Asn Ala Lys Gln Ala Phe Asp Pro Lys Asp Asn Pro Phe Tyr Lys Lys
930 935 940

Gly Gly Gln Leu Val Lys Ala Val Arg Val Glu Lys Thr Gln Glu Ser
945 950 955 960

Gly Val Leu Leu Asn Lys Lys Asn Ala Tyr Thr Ile Ala Asp Asn Gly
965 970 975

Asp Met Val Arg Val Asp Val Phe Cys Lys Val Asp Lys Lys Gly Lys
980 985 990

Asn Gln Tyr Phe Ile Val Pro Ile Tyr Ala Trp Gln Val Ala Glu Asn
995 1000 1005

Ile Leu Pro Asp Ile Asp Cys Lys Gly Tyr Arg Ile Asp Asp Ser
1010 1015 1020

Tyr Thr Phe Cys Phe Ser Leu His Lys Tyr Asp Leu Ile Ala Phe
1025 1030 1035

Gln Lys Asp Glu Lys Ser Lys Val Glu Phe Ala Tyr Tyr Ile Asn
1040 1045 1050

Cys Asp Ser Ser Asn Gly Arg Phe Tyr Leu Ala Trp His Asp Lys
1055 1060 1065

Gly Ser Lys Glu Gln Gln Phe Arg Ile Ser Thr Gln Asn Leu Val
1070 1075 1080

Leu Ile Gln Lys Tyr Gln Val Asn Glu Leu Gly Lys Glu Ile Arg
1085 1090 1095

Pro Cys Arg Leu Lys Lys Arg Pro Pro Val Arg Glu Asp Lys Arg
1100 1105 1110

Pro Ala Ala Thr Lys Lys Ala Gly Gln Ala Lys Lys Lys Lys Tyr
1115 1120 1125

Pro Tyr Asp Val Pro Asp Tyr Ala Gly Tyr Pro Tyr Asp Val Pro

1130		1135		1140
Asp Tyr Ala Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ala				
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Ala Pro Ala Ala Lys Lys Lys Lys Leu Asp				
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Pro Ile Asn Tyr Ile Leu Gly Leu Asp Ile Gly Ile Ala Ser Val Gly				
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Trp Ala Met Val Glu Ile Asp Glu Glu Glu Asn Pro Ile Arg Leu Ile				
	35		40	45
Asp Leu Gly Val Arg Val Phe Glu Arg Ala Glu Val Pro Lys Thr Gly				
	50		55	60
Asp Ser Leu Ala Met Ala Arg Arg Leu Ala Arg Ser Val Arg Arg Leu				
65		70	75	80
Thr Arg Arg Arg Ala His Arg Leu Leu Arg Ala Arg Arg Leu Leu Lys				
	85		90	95
Arg Glu Gly Val Leu Gln Ala Ala Asp Phe Asp Glu Asn Gly Leu Ile				
	100		105	110
Lys Ser Leu Pro Asn Thr Pro Trp Gln Leu Arg Ala Ala Ala Leu Asp				
	115		120	125
Arg Lys Leu Thr Pro Leu Glu Trp Ser Ala Val Leu Leu His Leu Ile				

130		135		140
Lys His Arg Gly Tyr Leu Ser Gln Arg Lys Asn Glu Gly Glu Thr Ala				
145		150		155
				160
Asp Lys Glu Leu Gly Ala Leu Leu Lys Gly Val Ala Asn Asn Ala His				
		165		170
				175
Ala Leu Gln Thr Gly Asp Phe Arg Thr Pro Ala Glu Leu Ala Leu Asn				
		180		185
				190
Lys Phe Glu Lys Glu Ser Gly His Ile Arg Asn Gln Arg Gly Asp Tyr				
		195		200
				205
Ser His Thr Phe Ser Arg Lys Asp Leu Gln Ala Glu Leu Ile Leu Leu				
		210		215
				220
Phe Glu Lys Gln Lys Glu Phe Gly Asn Pro His Val Ser Gly Gly Leu				
225		230		235
				240
Lys Glu Gly Ile Glu Thr Leu Leu Met Thr Gln Arg Pro Ala Leu Ser				
		245		250
				255
Gly Asp Ala Val Gln Lys Met Leu Gly His Cys Thr Phe Glu Pro Ala				
		260		265
				270
Glu Pro Lys Ala Ala Lys Asn Thr Tyr Thr Ala Glu Arg Phe Ile Trp				
		275		280
				285
Leu Thr Lys Leu Asn Asn Leu Arg Ile Leu Glu Gln Gly Ser Glu Arg				
		290		295
				300
Pro Leu Thr Asp Thr Glu Arg Ala Thr Leu Met Asp Glu Pro Tyr Arg				
305		310		315
				320
Lys Ser Lys Leu Thr Tyr Ala Gln Ala Arg Lys Leu Leu Gly Leu Glu				
		325		330
				335
Asp Thr Ala Phe Phe Lys Gly Leu Arg Tyr Gly Lys Asp Asn Ala Glu				
		340		345
				350

Ala Ser Thr Leu Met Glu Met Lys Ala Tyr His Ala Ile Ser Arg Ala
355 360 365

Leu Glu Lys Glu Gly Leu Lys Asp Lys Lys Ser Pro Leu Asn Leu Ser
370 375 380

Ser Glu Leu Gln Asp Glu Ile Gly Thr Ala Phe Ser Leu Phe Lys Thr
385 390 395 400

Asp Glu Asp Ile Thr Gly Arg Leu Lys Asp Arg Val Gln Pro Glu Ile
405 410 415

Leu Glu Ala Leu Leu Lys His Ile Ser Phe Asp Lys Phe Val Gln Ile
420 425 430

Ser Leu Lys Ala Leu Arg Arg Ile Val Pro Leu Met Glu Gln Gly Lys
435 440 445

Arg Tyr Asp Glu Ala Cys Ala Glu Ile Tyr Gly Asp His Tyr Gly Lys
450 455 460

Lys Asn Thr Glu Glu Lys Ile Tyr Leu Pro Pro Ile Pro Ala Asp Glu
465 470 475 480

Ile Arg Asn Pro Val Val Leu Arg Ala Leu Ser Gln Ala Arg Lys Val
485 490 495

Ile Asn Gly Val Val Arg Arg Tyr Gly Ser Pro Ala Arg Ile His Ile
500 505 510

Glu Thr Ala Arg Glu Val Gly Lys Ser Phe Lys Asp Arg Lys Glu Ile
515 520 525

Glu Lys Arg Gln Glu Glu Asn Arg Lys Asp Arg Glu Lys Ala Ala Ala
530 535 540

Lys Phe Arg Glu Tyr Phe Pro Asn Phe Val Gly Glu Pro Lys Ser Lys
545 550 555 560

Asp Ile Leu Lys Leu Arg Leu Tyr Glu Gln Gln His Gly Lys Cys Leu

565																570																575																		
Tyr	Ser	Gly	Lys	Glu	Ile	Asn	Leu	Val	Arg	Leu	Asn	Glu	Lys	Gly	Tyr																																			
			580																	585																	590													
Val	Glu	Ile	Asp	His	Ala	Leu	Pro	Phe	Ser	Arg	Thr	Trp	Asp	Asp	Ser																																			
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Phe	Asn	Asn	Lys	Val	Leu	Val	Leu	Gly	Ser	Glu	Asn	Gln	Asn	Lys	Gly																																			
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Asn	Gln	Thr	Pro	Tyr	Glu	Tyr	Phe	Asn	Gly	Lys	Asp	Asn	Ser	Arg	Glu																																			
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Trp	Gln	Glu	Phe	Lys	Ala	Arg	Val	Glu	Thr	Ser	Arg	Phe	Pro	Arg	Ser																																			
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Lys	Lys	Gln	Arg	Ile	Leu	Leu	Gln	Lys	Phe	Asp	Glu	Asp	Gly	Phe	Lys																																			
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Glu	Cys	Asn	Leu	Asn	Asp	Thr	Arg	Tyr	Val	Asn	Arg	Phe	Leu	Cys	Gln																																			
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Phe	Val	Ala	Asp	His	Ile	Leu	Leu	Thr	Gly	Lys	Gly	Lys	Arg	Arg	Val																																			
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Phe	Ala	Ser	Asn	Gly	Gln	Ile	Thr	Asn	Leu	Leu	Arg	Gly	Phe	Trp	Gly																																			
			705																	710																	715													
Leu	Arg	Lys	Val	Arg	Ala	Glu	Asn	Asp	Arg	His	His	Ala	Leu	Asp	Ala																																			
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Val	Val	Val	Ala	Cys	Ser	Thr	Val	Ala	Met	Gln	Gln	Lys	Ile	Thr	Arg																																			
			740																	745																	750													
Phe	Val	Arg	Tyr	Lys	Glu	Met	Asn	Ala	Phe	Asp	Gly	Lys	Thr	Ile	Asp																																			
			755																	760																	765													
Lys	Glu	Thr	Gly	Lys	Val	Leu	His	Gln	Lys	Thr	His	Phe	Pro	Gln	Pro																																			
			770																	775																	780													

Trp Glu Phe Phe Ala Gln Glu Val Met Ile Arg Val Phe Gly Lys Pro
785 790 795 800

Asp Gly Lys Pro Glu Phe Glu Glu Ala Asp Thr Pro Glu Lys Leu Arg
805 810 815

Thr Leu Leu Ala Glu Lys Leu Ser Ser Arg Pro Glu Ala Val His Glu
820 825 830

Tyr Val Thr Pro Leu Phe Val Ser Arg Ala Pro Asn Arg Lys Met Ser
835 840 845

Gly Ala His Lys Asp Thr Leu Arg Ser Ala Lys Arg Phe Val Lys His
850 855 860

Asn Glu Lys Ile Ser Val Lys Arg Val Trp Leu Thr Glu Ile Lys Leu
865 870 875 880

Ala Asp Leu Glu Asn Met Val Asn Tyr Lys Asn Gly Arg Glu Ile Glu
885 890 895

Leu Tyr Glu Ala Leu Lys Ala Arg Leu Glu Ala Tyr Gly Gly Asn Ala
900 905 910

Lys Gln Ala Phe Asp Pro Lys Asp Asn Pro Phe Tyr Lys Lys Gly Gly
915 920 925

Gln Leu Val Lys Ala Val Arg Val Glu Lys Thr Gln Glu Ser Gly Val
930 935 940

Leu Leu Asn Lys Lys Asn Ala Tyr Thr Ile Ala Asp Asn Gly Asp Met
945 950 955 960

Val Arg Val Asp Val Phe Cys Lys Val Asp Lys Lys Gly Lys Asn Gln
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