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<110> Novartis AG
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 <130> 52407-WO-PCT
 <150> EP 07150228.0
 <151> 2007-12-20
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Glu	Ile	Gln	Met	Lys	Arg	Thr	Ala	Ile	Glu	Ala	Phe	Asn	Glu	Thr	Ile	20	25	30	
Lys	Ile	Phe	Glu	Glu	Gln	Cys	Gln	Thr	Gln	Glu	Arg	Tyr	Ser	Lys	Glu	35	40	45	
Tyr	Ile	Glu	Lys	Phe	Lys	Arg	Glu	Gly	Asn	Glu	Lys	Glu	Ile	Gln	Arg	50	55	60	
Ile	Met	His	Asn	Tyr	Asp	Lys	Leu	Lys	Ser	Arg	Ile	Ser	Glu	Ile	Ile	65	70	75	80
Asp	Ser	Arg	Arg	Arg	Leu	Glu	Glu	Asp	Leu	Lys	Lys	Gln	Ala	Ala	Glu	85	90	95	
Tyr	Arg	Glu	Ile	Asp	Lys	Arg	Met	Asn	Ser	Ile	Lys	Pro	Gly	Gly	Gly	100	105	110	
Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Leu	Val	Glu	Cys	Leu	Leu	Pro	115	120	125	
Asn	Gly	Met	Ile	Val	Thr	Leu	Glu	Cys	Leu	Arg	Glu	Ala	Thr	Leu	Ile	130	135	140	
Thr	Ile	Lys	His	Glu	Leu	Phe	Lys	Glu	Ala	Arg	Lys	Tyr	Pro	Leu	His	145	150	155	160
Gln	Leu	Leu	Gln	Asp	Glu	Ser	Ser	Tyr	Ile	Phe	Val	Ser	Val	Thr	Gln	165	170	175	
Glu	Ala	Glu	Arg	Glu	Glu	Phe	Phe	Asp	Glu	Thr	Arg	Arg	Leu	Cys	Asp	180	185	190	
Leu	Arg	Leu	Phe	Gln	Pro	Phe	Leu	Lys	Val	Ile	Glu	Pro	Val	Gly	Asn	195	200	205	
Arg	Glu	Glu	Lys	Ile	Leu	Asn	Arg	Glu	Ile	Gly	Phe	Ala	Ile	Gly	Met	210	215	220	
Pro	Val	Cys	Glu	Phe	Asp	Met	Val	Lys	Asp	Pro	Glu	Val	Gln	Asp	Phe	225	230	235	240
Arg	Arg	Asn	Ile	Leu	Asn	Val	Cys	Lys	Glu	Ala	Val	Asp	Leu	Arg	Asp				

				245				250				255			
Leu	Asn	Ser	Pro	His	Ser	Arg	Ala	Met	Tyr	Val	Tyr	Pro	Pro	Asn	Val
			260				265						270		
Glu	Ser	Ser	Pro	Glu	Leu	Pro	Lys	His	Ile	Tyr	Asn	Lys	Leu	Asp	Lys
			275				280						285		
Gly	Gln	Ile	Ile	Val	Val	Ile	Trp	Val	Ile	Val	Ser	Pro	Asn	Asn	Asp
			290				295						300		
Lys	Gln	Lys	Tyr	Thr	Leu	Lys	Ile	Asn	His	Asp	Cys	Val	Pro	Glu	Gln
305				310						315			320		
Val	Ile	Ala	Glu	Ala	Ile	Arg	Lys	Lys	Thr	Arg	Ser	Met	Leu	Leu	Ser
			325						330			335			
Ser	Glu	Gln	Leu	Lys	Leu	Cys	Val	Leu	Glu	Tyr	Gln	Gly	Lys	Tyr	Ile
			340			345						350			
Leu	Lys	Val	Cys	Gly	Cys	Asp	Glu	Tyr	Phe	Leu	Glu	Lys	Tyr	Pro	Leu
			355			360						365			
Ser	Gln	Tyr	Lys	Tyr	Ile	Arg	Ser	Cys	Ile	Met	Leu	Gly	Arg	Met	Pro
			370			375						380			
Asn	Leu	Met	Leu	Met	Ala	Lys	Glu	Ser	Leu	Tyr	Ser	Gln	Leu	Pro	Met
385				390						395			400		
Asp	Cys	Phe	Thr	Met	Pro	Ser	Tyr	Ser	Arg	Arg	Ile	Ser	Thr	Ala	Thr
			405						410			415			
Pro	Tyr	Met	Asn	Gly	Glu	Thr	Ser	Thr	Lys	Ser	Leu	Trp	Val	Ile	Asn
			420			425						430			
Ser	Ala	Leu	Arg	Ile	Lys	Ile	Leu	Cys	Ala	Thr	Tyr	Val	Asn	Val	Asn
			435			440						445			
Ile	Arg	Asp	Ile	Asp	Lys	Ile	Tyr	Val	Arg	Thr	Gly	Ile	Tyr	His	Gly
			450			455						460			
Gly	Glu	Pro	Leu	Cys	Asp	Asn	Val	Asn	Thr	Gln	Arg	Val	Pro	Cys	Ser
465				470						475			480		
Asn	Pro	Arg	Trp	Asn	Glu	Trp	Leu	Asn	Tyr	Asp	Ile	Tyr	Ile	Pro	Asp
			485						490			495			

Leu Pro Arg Ala Ala Arg Leu Cys Leu Ser Ile Cys Ser Val Lys Gly
500 505 510

Arg Lys Gly Ala Lys Glu Glu His Cys Pro Leu Ala Trp Gly Asn Ile
515 520 525

Asn Leu Phe Asp Tyr Thr Asp Thr Leu Val Ser Gly Lys Met Ala Leu
530 535 540

Asn Leu Trp Pro Val Pro His Gly Leu Glu Asp Leu Leu Asn Pro Ile
545 550 555 560

Gly Val Thr Gly Ser Asn Pro Asn Lys Glu Thr Pro Cys Leu Glu Leu
565 570 575

Glu Phe Asp Trp Phe Ser Ser Val Val Lys Phe Pro Asp Met Ser Val
580 585 590

Ile Glu Glu His Ala Asn Trp Ser Val Ser Arg Glu Ala Gly Phe Ser
595 600 605

Tyr Ser His Ala Gly Leu Ser Asn Arg Leu Ala Arg Asp Asn Glu Leu
610 615 620

Arg Glu Asn Asp Lys Glu Gln Leu Lys Ala Ile Ser Thr Arg Asp Pro
625 630 635 640

Leu Ser Glu Ile Thr Glu Gln Glu Lys Asp Phe Leu Trp Ser His Arg
645 650 655

His Tyr Cys Val Thr Ile Pro Glu Ile Leu Pro Lys Leu Leu Leu Ser
660 665 670

Val Lys Trp Asn Ser Arg Asp Glu Val Ala Gln Met Tyr Cys Leu Val
675 680 685

Lys Asp Trp Pro Pro Ile Lys Pro Glu Gln Ala Met Glu Leu Leu Asp
690 695 700

Cys Asn Tyr Pro Asp Pro Met Val Arg Gly Phe Ala Val Arg Cys Leu
705 710 715 720

Glu Lys Tyr Leu Thr Asp Asp Lys Leu Ser Gln Tyr Leu Ile Gln Leu
725 730 735

Val Gln Val Leu Lys Tyr Glu Gln Tyr Leu Asp Asn Leu Leu Val Arg
740 745 750

Phe Leu Leu Lys Lys Ala Leu Thr Asn Gln Arg Ile Gly His Phe Phe
755 760 765

Phe Trp His Leu Lys Ser Glu Met His Asn Lys Thr Val Ser Gln Arg
770 775 780

Phe Gly Leu Leu Leu Glu Ser Tyr Cys Arg Ala Cys Gly Met Tyr Leu
785 790 795 800

Lys His Leu Asn Arg Gln Val Glu Ala Met Glu Lys Leu Ile Asn Leu
805 810 815

Thr Asp Ile Leu Lys Gln Glu Lys Lys Asp Glu Thr Gln Lys Val Gln
820 825 830

Met Lys Phe Leu Val Glu Gln Met Arg Arg Pro Asp Phe Met Asp Ala
835 840 845

Leu Gln Gly Phe Leu Ser Pro Leu Asn Pro Ala His Gln Leu Gly Asn
850 855 860

Leu Arg Leu Glu Glu Cys Arg Ile Met Ser Ser Ala Lys Arg Pro Leu
865 870 875 880

Trp Leu Asn Trp Glu Asn Pro Asp Ile Met Ser Glu Leu Leu Phe Gln
885 890 895

Asn Asn Glu Ile Ile Phe Lys Asn Gly Asp Asp Leu Arg Gln Asp Met
900 905 910

Leu Thr Leu Gln Ile Ile Arg Ile Met Glu Asn Ile Trp Gln Asn Gln
915 920 925

Gly Leu Asp Leu Arg Met Leu Pro Tyr Gly Cys Leu Ser Ile Gly Asp
930 935 940

Cys Val Gly Leu Ile Glu Val Val Arg Asn Ser His Thr Ile Met Gln
945 950 955 960

Ile Gln Cys Lys Gly Gly Leu Lys Gly Ala Leu Gln Phe Asn Ser His
965 970 975

Thr Leu His Gln Trp Leu Lys Asp Lys Asn Lys Gly Glu Ile Tyr Asp
980 985 990

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

Thr Phe Ile Leu Gly Ile Gly Asp Arg His Asn Ser Asn Ile Met
1010 1015 1020

Val Lys Asp Asp Gly Gln Leu Phe His Ile Asp Phe Gly His Phe
1025 1030 1035

Leu Asp His Lys Lys Lys Lys Phe Gly Tyr Lys Arg Glu Arg Val
1040 1045 1050

Pro Phe Val Leu Thr Gln Asp Phe Leu Ile Val Ile Ser Lys Gly
1055 1060 1065

Ala Gln Glu Cys Thr Lys Thr Arg Glu Phe Glu Arg Phe Gln Glu
1070 1075 1080

Met Cys Tyr Lys Ala Tyr Leu Ala Ile Arg Gln His Ala Asn Leu
1085 1090 1095

Phe Ile Asn Leu Phe Ser Met Met Leu Gly Ser Gly Met Pro Glu
1100 1105 1110

Leu Gln Ser Phe Asp Asp Ile Ala Tyr Ile Arg Lys Thr Leu Ala
1115 1120 1125

Leu Asp Lys Thr Glu Gln Glu Ala Leu Glu Tyr Phe Met Lys Gln
1130 1135 1140

Met Asn Asp Ala His His Gly Gly Trp Thr Thr Lys Met Asp Trp
1145 1150 1155

Ile Phe His Thr Ile Lys Gln His Ala Leu Asn Glu Leu Gly Gly
1160 1165 1170

Ala His His His His His His
1175 1180

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 <213> Artificial

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 agattatatg aagaat 76

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 actgaagcat cctcctcctc ctctcctgg tttaatgctg ttcatacgtt tgtc 54

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 <213> Artificial

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 Lys Ile Phe Glu Glu Gln Cys Gln Thr Gln Glu Arg Tyr Ser Lys Glu
 35 40 45

 Tyr Ile Glu Lys Phe Lys Arg Glu Gly Lys Glu Lys Glu Ile Gln Arg
 50 55 60

 Ile Met His Asn Tyr Asp Lys Leu Lys Ser Arg Ile Ser Glu Ile Ile
 65 70 75 80

 Asp Ser Arg Arg Arg Leu Glu Glu Asp Leu Lys Lys Gln Ala Ala Glu
 85 90 95

 Tyr Arg Glu Ile Asp Lys Arg Met Asn Ser Ile Lys Pro Gly Gly Gly
 100 105 110

 Gly Gly Gly Cys Phe Ser Phe Ile Met Pro Pro Ala Met Ala Asp Ile

115

120

125

Leu Asp Ile Trp Ala Val Asp Ser Gln Ile Ala Ser Asp Gly Ser Ile
 130 135 140

Pro Val Asp Phe Leu Leu Pro Thr Gly Ile Tyr Ile Gln Leu Glu Val
 145 150 155 160

Pro Arg Glu Ala Thr Ile Ser Tyr Ile Lys Gln Met Leu Trp Lys Gln
 165 170 175

Val His Asn Tyr Pro Met Phe Asn Leu Leu Met Asp Ile Asp Ser Tyr
 180 185 190

Met Phe Ala Cys Val Asn Gln Thr Ala Val Tyr Glu Glu Leu Glu Asp
 195 200 205

Glu Thr Arg Arg Leu Cys Asp Val Arg Pro Phe Leu Pro Val Leu Lys
 210 215 220

Leu Val Thr Arg Ser Cys Asp Pro Gly Glu Lys Leu Asp Ser Lys Ile
 225 230 235 240

Gly Val Leu Ile Gly Lys Gly Leu His Glu Phe Asp Ser Leu Lys Asp
 245 250 255

Pro Glu Val Asn Glu Phe Arg Arg Lys Met Arg Lys Phe Ser Glu Glu
 260 265 270

Lys Ile Leu Ser Leu Val Gly Leu Ser Trp Met Asp Trp Leu Lys Gln
 275 280 285

Thr Tyr Pro Pro Glu His Glu Pro Ser Ile Pro Glu Asn Leu Glu Asp
 290 295 300

Lys Leu Tyr Gly Gly Lys Leu Ile Val Ala Val His Phe Glu Asn Cys
 305 310 315 320

Gln Asp Val Phe Ser Phe Gln Val Ser Pro Asn Met Asn Pro Ile Lys
 325 330 335

Val Asn Glu Leu Ala Ile Gln Lys Arg Leu Thr Ile His Gly Lys Glu
 340 345 350

Asp Glu Val Ser Pro Tyr Asp Tyr Val Leu Gln Val Ser Gly Arg Val
 355 360 365

Glu Tyr Val Phe Gly Asp His Pro Leu Ile Gln Phe Gln Tyr Ile Arg
370 375 380

Asn Cys Val Met Asn Arg Ala Leu Pro His Phe Ile Leu Val Glu Cys
385 390 395 400

Cys Lys Ile Lys Lys Met Tyr Glu Gln Glu Met Ile Ala Ile Glu Ala
405 410 415

Ala Ile Asn Arg Asn Ser Ser Asn Leu Pro Leu Pro Leu Pro Pro Lys
420 425 430

Lys Thr Arg Ile Ile Ser His Val Trp Glu Asn Asn Asn Pro Phe Gln
435 440 445

Ile Val Leu Val Lys Gly Asn Lys Leu Asn Thr Glu Glu Thr Val Lys
450 455 460

Val His Val Arg Ala Gly Leu Phe His Gly Thr Glu Leu Leu Cys Lys
465 470 475 480

Thr Ile Val Ser Ser Glu Val Ser Gly Lys Asn Asp His Ile Trp Asn
485 490 495

Glu Pro Leu Glu Phe Asp Ile Asn Ile Cys Asp Leu Pro Arg Met Ala
500 505 510

Arg Leu Cys Phe Ala Val Tyr Ala Val Leu Asp Lys Val Lys Thr Lys
515 520 525

Lys Ser Thr Lys Thr Ile Asn Pro Ser Lys Tyr Gln Thr Ile Arg Lys
530 535 540

Ala Gly Lys Val His Tyr Pro Val Ala Trp Val Asn Thr Met Val Phe
545 550 555 560

Asp Phe Lys Gly Gln Leu Arg Thr Gly Asp Ile Ile Leu His Ser Trp
565 570 575

Ser Ser Phe Pro Asp Glu Leu Glu Glu Met Leu Asn Pro Met Gly Thr
580 585 590

Val Gln Thr Asn Pro Tyr Thr Glu Asn Ala Thr Ala Leu His Val Lys
595 600 605

Phe Pro Glu Asn Lys Lys Gln Pro Tyr Tyr Tyr Pro Pro Phe Asp Lys
610 615 620

Ile Ile Glu Lys Ala Ala Glu Ile Ala Ser Ser Asp Ser Ala Asn Val
625 630 635 640

Ser Ser Arg Gly Gly Lys Lys Phe Leu Pro Val Leu Lys Glu Ile Leu
645 650 655

Asp Arg Asp Pro Leu Ser Gln Leu Cys Glu Asn Glu Met Asp Leu Ile
660 665 670

Trp Thr Leu Arg Gln Asp Cys Arg Glu Ile Phe Pro Gln Ser Leu Pro
675 680 685

Lys Leu Leu Leu Ser Ile Lys Trp Asn Lys Leu Glu Asp Val Ala Gln
690 695 700

Leu Gln Ala Leu Leu Gln Ile Trp Pro Lys Leu Pro Pro Arg Glu Ala
705 710 715 720

Leu Glu Leu Leu Asp Phe Asn Tyr Pro Asp Gln Tyr Val Arg Glu Tyr
725 730 735

Ala Val Gly Cys Leu Arg Gln Met Ser Asp Glu Glu Leu Ser Gln Tyr
740 745 750

Leu Leu Gln Leu Val Gln Val Leu Lys Tyr Glu Pro Phe Leu Asp Cys
755 760 765

Ala Leu Ser Arg Phe Leu Leu Glu Arg Ala Leu Gly Asn Arg Arg Ile
770 775 780

Gly Gln Phe Leu Phe Trp His Leu Arg Ser Glu Val His Ile Pro Ala
785 790 795 800

Val Ser Val Gln Phe Gly Val Ile Leu Glu Ala Tyr Cys Arg Gly Ser
805 810 815

Val Gly His Met Lys Val Leu Ser Lys Gln Val Glu Ala Leu Asn Lys
820 825 830

Leu Lys Thr Leu Asn Ser Leu Ile Lys Leu Asn Ala Val Lys Leu Asn
835 840 845

Arg Ala Lys Gly Lys Glu Ala Met His Thr Cys Leu Lys Gln Ser Ala
 850 855 860

Tyr Arg Glu Ala Leu Ser Asp Leu Gln Ser Pro Leu Asn Pro Cys Val
 865 870 875 880

Ile Leu Ser Glu Leu Tyr Val Glu Lys Cys Lys Tyr Met Asp Ser Lys
 885 890 895

Met Lys Pro Leu Trp Leu Val Tyr Asn Asn Lys Val Phe Gly Glu Asp
 900 905 910

Ser Val Gly Val Ile Phe Lys Asn Gly Asp Asp Leu Arg Gln Asp Met
 915 920 925

Leu Thr Leu Gln Met Leu Arg Leu Met Asp Leu Leu Trp Lys Glu Ala
 930 935 940

Gly Leu Asp Leu Arg Met Leu Pro Tyr Gly Cys Leu Ala Thr Gly Asp
 945 950 955 960

Arg Ser Gly Leu Ile Glu Val Val Ser Thr Ser Glu Thr Ile Ala Asp
 965 970 975

Ile Gln Leu Asn Ser Ser Asn Val Ala Ala Ala Ala Ala Phe Asn Lys
 980 985 990

Asp Ala Leu Leu Asn Trp Leu Lys Glu Tyr Asn Ser Gly Asp Asp Leu
 995 1000 1005

Asp Arg Ala Ile Glu Glu Phe Thr Leu Ser Cys Ala Gly Tyr Cys
 1010 1015 1020

Val Ala Ser Tyr Val Leu Gly Ile Gly Asp Arg His Ser Asp Asn
 1025 1030 1035

Ile Met Val Lys Lys Thr Gly Gln Leu Phe His Ile Asp Phe Gly
 1040 1045 1050

His Ile Leu Gly Asn Phe Lys Ser Lys Phe Gly Ile Lys Arg Glu
 1055 1060 1065

Arg Val Pro Phe Ile Leu Thr Tyr Asp Phe Ile His Val Ile Gln
 1070 1075 1080

Gln Gly Lys Thr Gly Asn Thr Glu Lys Phe Gly Arg Phe Arg Gln

1085

1090

1095

Cys Cys Glu Asp Ala Tyr Leu Ile Leu Arg Arg His Gly Asn Leu
 1100 1105 1110

Phe Ile Thr Leu Phe Ala Leu Met Leu Thr Ala Gly Leu Pro Glu
 1115 1120 1125

Leu Thr Ser Val Lys Asp Ile Gln Tyr Leu Lys Asp Ser Leu Ala
 1130 1135 1140

Leu Gly Lys Ser Glu Glu Glu Ala Leu Lys Gln Phe Lys Gln Lys
 1145 1150 1155

Phe Asp Glu Ala Leu Arg Glu Ser Trp Thr Thr Lys Val Asn Trp
 1160 1165 1170

Met Ala His Thr Val Arg Lys Asp Tyr Arg Ser Gly Ala His His
 1175 1180 1185

His His His His Gly Ala
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Phe Thr Arg Arg Gly Leu Val Thr Pro Arg Met Ala Glu Val Ala Ser
 35 40 45

Arg Asp Pro Lys Leu Tyr Ala Met His Pro Trp Val Thr Ser Lys Pro
 50 55 60

Leu Pro Glu Tyr Leu Trp Lys Lys Ile Ala Asn Asn Cys Ile Phe Ile
 65 70 75 80

Val Ile His Arg Ser Thr Thr Ser Gln Thr Ile Lys Val Ser Pro Asp
85 90 95

Asp Thr Pro Gly Ala Ile Leu Gln Ser Phe Phe Thr Lys Met Ala Lys
100 105 110

Lys Lys Ser Leu Met Asp Ile Pro Glu Ser Gln Ser Glu Gln Asp Phe
115 120 125

Val Leu Arg Val Cys Gly Arg Asp Glu Tyr Leu Val Gly Glu Thr Pro
130 135 140

Ile Lys Asn Phe Gln Trp Val Arg His Cys Leu Lys Asn Gly Glu Glu
145 150 155 160

Ile His Val Val Leu Asp Thr Pro Pro Asp Pro Ala Leu Asp Glu Val
165 170 175

Arg Lys Glu Glu Trp Pro Leu Val Asp Asp Cys Thr Gly Val Thr Gly
180 185 190

Tyr His Glu Gln Leu Thr Ile His Gly Lys Asp His Glu Ser Val Phe
195 200 205

Thr Val Ser Leu Trp Asp Cys Asp Arg Lys Phe Arg Val Lys Ile Arg
210 215 220

Gly Ile Asp Ile Pro Val Leu Pro Arg Asn Thr Asp Leu Thr Val Phe
225 230 235 240

Val Glu Ala Asn Ile Gln His Gly Gln Gln Val Leu Cys Gln Arg Arg
245 250 255

Thr Ser Pro Lys Pro Phe Thr Glu Glu Val Leu Trp Asn Val Trp Leu
260 265 270

Glu Phe Ser Ile Lys Ile Lys Asp Leu Pro Lys Gly Ala Leu Leu Asn
275 280 285

Leu Gln Ile Tyr Cys Gly Lys Ala Pro Ala Leu Ser Ser Lys Ala Ser
290 295 300

Ala Glu Ser Pro Ser Ser Glu Ser Lys Gly Lys Val Arg Leu Leu Tyr
305 310 315 320

Tyr Val Asn Leu Leu Leu Ile Asp His Arg Phe Leu Leu Arg Arg Gly

325							330						335		
Glu	Tyr	Val	Leu 340	His	Met	Trp	Gln	Ile 345	Ser	Gly	Lys	Gly	Glu 350	Asp	Gln
Gly	Ser	Phe 355	Asn	Ala	Asp	Lys	Leu 360	Thr	Ser	Ala	Thr	Asn 365	Pro	Asp	Lys
Glu	Asn 370	Ser	Met	Ser	Ile	Ser 375	Ile	Leu	Leu	Asp	Asn 380	Tyr	Cys	His	Pro
Ile 385	Ala	Leu	Pro	Lys	His 390	Gln	Pro	Thr	Pro	Asp 395	Pro	Glu	Gly	Asp	Arg 400
Val	Arg	Ala	Glu 405	Met	Pro	Asn	Gln	Leu 410	Arg	Lys	Gln	Leu	Glu 415	Ala	Ile
Ile	Ala	Thr	Asp 420	Pro	Leu	Asn	Pro	Leu 425	Thr	Ala	Glu	Asp	Lys 430	Glu	Leu
Leu	Trp	His 435	Phe	Arg	Tyr	Glu	Ser 440	Leu	Lys	His	Pro	Lys 445	Ala	Tyr	Pro
Lys	Leu 450	Phe	Ser	Ser	Val	Lys 455	Trp	Gly	Gln	Gln	Glu 460	Ile	Val	Ala	Lys
Thr 465	Tyr	Gln	Leu	Leu	Ala 470	Arg	Arg	Glu	Val	Trp 475	Asp	Gln	Ser	Ala	Leu 480
Asp	Val	Gly	Leu 485	Thr	Met	Gln	Leu	Leu 490	Asp	Cys	Asn	Phe	Ser	Asp 495	Glu
Asn	Val	Arg	Ala 500	Ile	Ala	Val	Gln	Lys 505	Leu	Glu	Ser	Leu	Glu 510	Asp	Asp
Asp	Val	Leu 515	His	Tyr	Leu	Leu	Gln 520	Leu	Val	Gln	Ala	Val 525	Lys	Phe	Glu
Pro	Tyr 530	His	Asp	Ser	Ala	Leu 535	Ala	Arg	Phe	Leu	Leu 540	Lys	Arg	Gly	Leu
Arg 545	Asn	Lys	Arg	Ile	Gly 550	His	Phe	Leu	Phe	Trp 555	Phe	Leu	Arg	Ser	Glu 560
Ile	Ala	Gln	Ser	Arg 565	His	Tyr	Gln	Gln 570	Arg	Phe	Ala	Val	Ile 575	Leu	Glu

Ala Tyr Leu Arg Gly Cys Gly Thr Ala Met Leu His Asp Phe Thr Gln
580 585 590

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

Ser Leu Ser Ala Glu Lys Tyr Asp Val Ser Ser Gln Val Ile Ser Gln
610 615 620

Leu Lys Gln Lys Leu Glu Asn Leu Gln Asn Ser Gln Leu Pro Glu Ser
625 630 635 640

Phe Arg Val Pro Tyr Asp Pro Gly Leu Lys Ala Gly Ala Leu Ala Ile
645 650 655

Glu Lys Cys Lys Val Met Ala Ser Lys Lys Lys Pro Leu Trp Leu Glu
660 665 670

Phe Lys Cys Ala Asp Pro Thr Ala Leu Ser Asn Glu Thr Ile Gly Ile
675 680 685

Ile Phe Lys His Gly Asp Asp Leu Arg Gln Asp Met Leu Ile Leu Gln
690 695 700

Ile Leu Arg Ile Met Glu Ser Ile Trp Glu Thr Glu Ser Leu Asp Leu
705 710 715 720

Cys Leu Leu Pro Tyr Gly Cys Ile Ser Thr Gly Asp Lys Ile Gly Met
725 730 735

Ile Glu Ile Val Lys Asp Ala Thr Thr Ile Ala Lys Ile Gln Gln Ser
740 745 750

Thr Val Gly Asn Thr Gly Ala Phe Lys Asp Glu Val Leu Asn His Trp
755 760 765

Leu Lys Glu Lys Ser Pro Thr Glu Glu Lys Phe Gln Ala Ala Val Glu
770 775 780

Arg Phe Val Tyr Ser Cys Ala Gly Tyr Cys Val Ala Thr Phe Val Leu
785 790 795 800

Gly Ile Gly Asp Arg His Asn Asp Asn Ile Met Ile Thr Glu Thr Gly
805 810 815

Asn Leu Phe His Ile Asp Phe Gly His Ile Leu Gly Asn Tyr Lys Ser
820 825 830

Phe Leu Gly Ile Asn Lys Glu Arg Val Pro Phe Val Leu Thr Pro Asp
835 840 845

Phe Leu Phe Val Met Gly Thr Ser Gly Lys Lys Thr Ser Pro His Phe
850 855 860

Gln Lys Phe Gln Asp Ile Cys Val Lys Ala Tyr Leu Ala Leu Arg His
865 870 875 880

His Thr Asn Leu Leu Ile Ile Leu Phe Ser Met Met Leu Met Thr Gly
885 890 895

Met Pro Gln Leu Thr Ser Lys Glu Asp Ile Glu Tyr Ile Arg Asp Ala
900 905 910

Leu Thr Val Gly Lys Asn Glu Glu Asp Ala Lys Lys Tyr Phe Leu Asp
915 920 925

Gln Ile Glu Val Cys Arg Asp Lys Gly Trp Thr Val Gln Phe Asn Trp
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His His His His His His
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<223> PCR primer

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<212> PRT	
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<223> PI3K kinase construct	
<400> 20	

Met	Arg	Glu	Tyr	Asp	Arg	Leu	Tyr	Glu	Glu	Tyr	Thr	Arg	Thr	Ser	Gln	1	5	10	15
Glu	Ile	Gln	Met	Lys	Arg	Thr	Ala	Ile	Glu	Ala	Phe	Asn	Glu	Thr	Ile	20	25	30	
Lys	Ile	Phe	Glu	Glu	Gln	Cys	Gln	Thr	Gln	Glu	Arg	Tyr	Ser	Lys	Glu	35	40	45	
Tyr	Ile	Glu	Lys	Phe	Lys	Arg	Glu	Gly	Asn	Glu	Lys	Glu	Ile	Gln	Arg	50	55	60	
Ile	Met	His	Asn	Tyr	Asp	Lys	Leu	Lys	Ser	Arg	Ile	Ser	Glu	Ile	Ile	65	70	75	80
Asp	Ser	Arg	Arg	Arg	Leu	Glu	Glu	Asp	Leu	Lys	Lys	Gln	Ala	Ala	Glu	85	90	95	
Tyr	Arg	Glu	Ile	Asp	Lys	Arg	Met	Asn	Ser	Ile	Lys	Pro	Gly	Gly	Gly	100	105	110	
Gly	Gly	Gly	Pro	Pro	Gly	Val	Asp	Cys	Pro	Met	Glu	Phe	Trp	Thr	Lys	115	120	125	
Glu	Glu	Asn	Gln	Ser	Val	Val	Val	Asp	Phe	Leu	Leu	Pro	Thr	Gly	Val	130	135	140	
Tyr	Leu	Asn	Phe	Pro	Val	Ser	Arg	Asn	Ala	Asn	Leu	Ser	Thr	Ile	Lys	145	150	155	160
Gln	Leu	Leu	Trp	His	Arg	Ala	Gln	Tyr	Glu	Pro	Leu	Phe	His	Met	Leu	165	170	175	
Ser	Gly	Pro	Glu	Ala	Tyr	Val	Phe	Thr	Cys	Ile	Asn	Gln	Thr	Ala	Glu	180	185	190	
Gln	Gln	Glu	Leu	Glu	Asp	Glu	Gln	Arg	Arg	Leu	Cys	Asp	Val	Gln	Pro	195	200	205	
Phe	Leu	Pro	Val	Leu	Arg	Leu	Val	Ala	Arg	Glu	Gly	Asp	Arg	Val	Lys	210	215	220	
Lys	Leu	Ile	Asn	Ser	Gln	Ile	Ser	Leu	Leu	Ile	Gly	Lys	Gly	Leu	His	225	230	235	240

Glu Phe Asp Ser Leu Cys Asp Pro Glu Val Asn Asp Phe Arg Ala Lys
245 250 255

Met Cys Gln Phe Cys Glu Glu Ala Ala Ala Arg Arg Gln Gln Leu Gly
260 265 270

Trp Glu Ala Trp Leu Gln Tyr Ser Phe Pro Leu Gln Leu Glu Pro Ser
275 280 285

Ala Gln Thr Trp Gly Pro Gly Thr Leu Arg Leu Pro Asn Arg Ala Leu
290 295 300

Leu Val Asn Val Lys Phe Glu Gly Ser Glu Glu Ser Phe Thr Phe Gln
305 310 315 320

Val Ser Thr Lys Asp Val Pro Leu Ala Leu Met Ala Cys Ala Leu Arg
325 330 335

Lys Lys Ala Thr Val Phe Arg Gln Pro Leu Val Glu Gln Pro Glu Asp
340 345 350

Tyr Thr Leu Gln Val Asn Gly Arg His Glu Tyr Leu Tyr Gly Ser Tyr
355 360 365

Pro Leu Cys Gln Phe Gln Tyr Ile Cys Ser Cys Leu His Ser Gly Leu
370 375 380

Thr Pro His Leu Thr Met Val His Ser Ser Ser Ile Leu Ala Met Arg
385 390 395 400

Asp Glu Gln Ser Asn Pro Ala Pro Gln Val Gln Lys Pro Arg Ala Lys
405 410 415

Pro Pro Pro Ile Pro Ala Lys Lys Pro Ser Ser Val Ser Leu Trp Ser
420 425 430

Leu Glu Gln Pro Phe Arg Ile Glu Leu Ile Gln Gly Ser Lys Val Asn
435 440 445

Ala Asp Glu Arg Met Lys Leu Val Val Gln Ala Gly Leu Phe His Gly
450 455 460

Asn Glu Met Leu Cys Lys Thr Val Ser Ser Ser Glu Val Ser Val Cys
465 470 475 480

Ser Glu Pro Val Trp Lys Gln Arg Leu Glu Phe Asp Ile Asn Ile Cys

485

490

495

Asp Leu Pro Arg Met Ala Arg Leu Cys Phe Ala Leu Tyr Ala Val Ile
 500 505 510

Glu Lys Ala Lys Lys Ala Arg Ser Thr Lys Lys Lys Ser Lys Lys Ala
 515 520 525

Asp Cys Pro Ile Ala Trp Ala Asn Leu Met Leu Phe Asp Tyr Lys Asp
 530 535 540

Gln Leu Lys Thr Gly Glu Arg Cys Leu Tyr Met Trp Pro Ser Val Pro
 545 550 555 560

Asp Glu Lys Gly Glu Leu Leu Asn Pro Thr Gly Thr Val Arg Ser Asn
 565 570 575

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

Ala Pro His Pro Val Tyr Tyr Pro Ala Leu Glu Lys Ile Leu Glu Leu
 595 600 605

Gly Arg His Ser Glu Cys Val His Val Thr Glu Glu Glu Gln Leu Gln
 610 615 620

Leu Arg Glu Ile Leu Glu Arg Arg Gly Ser Gly Glu Leu Tyr Glu His
 625 630 635 640

Glu Lys Asp Leu Val Trp Lys Leu Arg His Glu Val Gln Glu His Phe
 645 650 655

Pro Glu Ala Leu Ala Arg Leu Leu Leu Val Thr Lys Trp Asn Lys His
 660 665 670

Glu Asp Val Ala Gln Met Leu Tyr Leu Leu Cys Ser Trp Pro Glu Leu
 675 680 685

Pro Val Leu Ser Ala Leu Glu Leu Leu Asp Phe Ser Phe Pro Asp Cys
 690 695 700

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

Glu Leu Phe Gln Tyr Leu Leu Gln Leu Val Gln Val Leu Lys Tyr Glu
 725 730 735

Ser Tyr Leu Asp Cys Glu Leu Thr Lys Phe Leu Leu Asp Arg Ala Leu
740 745 750

Ala Asn Arg Lys Ile Gly His Phe Leu Phe Trp His Leu Arg Ser Glu
755 760 765

Met His Val Pro Ser Val Ala Leu Arg Phe Gly Leu Ile Leu Glu Ala
770 775 780

Tyr Cys Arg Gly Ser Thr His His Met Lys Val Leu Met Lys Gln Gly
785 790 795 800

Glu Ala Leu Ser Lys Leu Lys Ala Leu Asn Asp Phe Val Lys Leu Ser
805 810 815

Ser Gln Lys Thr Pro Lys Pro Gln Thr Lys Glu Leu Met His Leu Cys
820 825 830

Met Arg Gln Glu Ala Tyr Leu Glu Ala Leu Ser His Leu Gln Ser Pro
835 840 845

Leu Asp Pro Ser Thr Leu Leu Ala Glu Val Cys Val Glu Gln Cys Thr
850 855 860

Phe Met Asp Ser Lys Met Lys Pro Leu Trp Ile Met Tyr Ser Asn Glu
865 870 875 880

Glu Ala Gly Ser Gly Gly Ser Val Gly Ile Ile Phe Lys Asn Gly Asp
885 890 895

Asp Leu Arg Gln Asp Met Leu Thr Leu Gln Met Ile Gln Leu Met Asp
900 905 910

Val Leu Trp Lys Gln Glu Gly Leu Asp Leu Arg Met Thr Pro Tyr Gly
915 920 925

Cys Leu Pro Thr Gly Asp Arg Thr Gly Leu Ile Glu Val Val Leu Arg
930 935 940

Ser Asp Thr Ile Ala Asn Ile Gln Leu Asn Lys Ser Asn Met Ala Ala
945 950 955 960

Thr Ala Ala Phe Asn Lys Asp Ala Leu Leu Asn Trp Leu Lys Ser Lys
965 970 975

Asn Pro Gly Glu Ala Leu Asp Arg Ala Ile Glu Glu Phe Thr Leu Ser
980 985 990

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

His Ser Asp Asn Ile Met Ile Arg Glu Ser Gly Gln Leu Phe His
1010 1015 1020

Ile Asp Phe Gly His Phe Leu Gly Asn Phe Lys Thr Lys Phe Gly
1025 1030 1035

Ile Asn Arg Glu Arg Val Pro Phe Ile Leu Thr Tyr Asp Phe Val
1040 1045 1050

His Val Ile Gln Gln Gly Lys Thr Asn Asn Ser Glu Lys Phe Glu
1055 1060 1065

Arg Phe Arg Gly Tyr Cys Glu Arg Ala Tyr Thr Ile Leu Arg Arg
1070 1075 1080

His Gly Leu Leu Phe Leu His Leu Phe Ala Leu Met Arg Ala Ala
1085 1090 1095

Gly Leu Pro Glu Leu Ser Cys Ser Lys Asp Ile Gln Tyr Leu Lys
1100 1105 1110

Asp Ser Leu Ala Leu Gly Lys Thr Glu Glu Glu Ala Leu Lys His
1115 1120 1125

Phe Arg Val Lys Phe Asn Glu Ala Leu Arg Glu Ser Trp Lys Thr
1130 1135 1140

Lys Val Asn Trp Leu Ala His Asn Val Ser Lys Asp Asn Arg Gln
1145 1150 1155

Glu Leu Gly Gly Ala His His His His His His
1160 1165