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Gly Gly Ile Arg Met Ala Gln Gln Ser Cys Glu Ala Tyr Gly Tyr Lys			
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gta agc gac gaa gtg aaa aaa atc ttt acg gaa tac cgg aaa aca cac			432

Val	Ser	Asp	Glu	Val	Lys	Lys	Ile	Phe	Thr	Glu	Tyr	Arg	Lys	Thr	His	
130						135					140					
aac	caa	ggt	gtg	ttt	gac	gtt	tac	acc	gac	gag	atg	aga	tta	gcg	cgc	480
Asn	Gln	Gly	Val	Phe	Asp	Val	Tyr	Thr	Asp	Glu	Met	Arg	Leu	Ala	Arg	
145					150					155					160	
aaa	gca	gga	atc	atc	acc	ggc	ctt	cct	gat	gcg	tac	gga	cgc	ggc	cgt	528
Lys	Ala	Gly	Ile	Ile	Thr	Gly	Leu	Pro	Asp	Ala	Tyr	Gly	Arg	Gly	Arg	
				165					170					175		
atc	atc	ggc	gac	tat	cgt	cgc	gtc	gcg	tta	tac	ggg	gtc	gat	cgt	ttg	576
Ile	Ile	Gly	Asp	Tyr	Arg	Arg	Val	Ala	Leu	Tyr	Gly	Val	Asp	Arg	Leu	
			180					185					190			
atc	gaa	gaa	aaa	caa	aaa	gat	ttg	aaa	aac	act	ggc	gca	aga	acg	atg	624
Ile	Glu	Glu	Lys	Gln	Lys	Asp	Leu	Lys	Asn	Thr	Gly	Ala	Arg	Thr	Met	
		195				200					205					
acc	gaa	gac	att	atc	cgt	ctt	cgc	gaa	gaa	att	tca	gag	caa	att	cgc	672
Thr	Glu	Asp	Ile	Ile	Arg	Leu	Arg	Glu	Glu	Ile	Ser	Glu	Gln	Ile	Arg	
	210					215					220					
gca	tta	aac	gag	tta	aaa	caa	atg	gcg	tta	agc	tat	gga	tat	gat	att	720
Ala	Leu	Asn	Glu	Leu	Lys	Gln	Met	Ala	Leu	Ser	Tyr	Gly	Tyr	Asp	Ile	
225					230					235					240	
tcc	aaa	ccg	gca	cgg	aac	gca	cat	gaa	gca	ttc	caa	tgg	ctc	tat	ttc	768
Ser	Lys	Pro	Ala	Arg	Asn	Ala	His	Glu	Ala	Phe	Gln	Trp	Leu	Tyr	Phe	
				245					250					255		
gct	tat	ctt	gct	gct	att	aaa	gaa	caa	aac	ggc	gcg	gcg	atg	agc	tta	816
Ala	Tyr	Leu	Ala	Ala	Ile	Lys	Glu	Gln	Asn	Gly	Ala	Ala	Met	Ser	Leu	
			260					265					270			
ggg	cgc	gtt	tcc	acc	ttc	ttg	gat	att	tat	atc	gag	cgc	gac	ttt	gca	864
Gly	Arg	Val	Ser	Thr	Phe	Leu	Asp	Ile	Tyr	Ile	Glu	Arg	Asp	Phe	Ala	
		275					280					285				
gaa	ggc	aca	tta	acg	gaa	aaa	gaa	gcg	caa	gaa	ctt	gtc	gac	cat	ttt	912
Glu	Gly	Thr	Leu	Thr	Glu	Lys	Glu	Ala	Gln	Glu	Leu	Val	Asp	His	Phe	
	290					295					300					
gtg	atg	aaa	ttg	cgc	ctt	gtc	aaa	ttt	gcc	aga	acg	ccg	gaa	tat	aac	960
Val	Met	Lys	Leu	Arg	Leu	Val	Lys	Phe	Ala	Arg	Thr	Pro	Glu	Tyr	Asn	
305					310					315					320	
gaa	ctg	ttt	agc	gga	gac	ccg	aca	tgg	gtt	acc	gaa	tcg	atc	ggc	gga	1008
Glu	Leu	Phe	Ser	Gly	Asp	Pro	Thr	Trp	Val	Thr	Glu	Ser	Ile	Gly	Gly	
				325					330					335		
att	gcc	att	gat	ggc	cgt	ccg	tta	gtg	aca	aag	aac	tcg	ttc	cgt	ttc	1056
Ile	Ala	Ile	Asp	Gly	Arg	Pro	Leu	Val	Thr	Lys	Asn	Ser	Phe	Arg	Phe	
			340					345					350			
ctt	cat	acg	tta	gat	aac	tta	gga	cct	gcg	cca	gag	cca	aac	tta	aca	1104
Leu	His	Thr	Leu	Asp	Asn	Leu	Gly	Pro	Ala	Pro	Glu	Pro	Asn	Leu	Thr	
		355					360					365				

gta ctt tgg tcg aaa caa ttg ccg gaa gca ttc aaa gag tat tgc gcg Val Leu Trp Ser Lys Gln Leu Pro Glu Ala Phe Lys Glu Tyr Cys Ala 370 375 380	1152
aaa atg tcg atc aaa aca agc tcg att caa tat gaa aat gac gac tta Lys Met Ser Ile Lys Thr Ser Ser Ile Gln Tyr Glu Asn Asp Asp Leu 385 390 395 400	1200
atg cgc gtc gaa ttt ggc gat gat tac gga att gct tgc tgc gta tca Met Arg Val Glu Phe Gly Asp Asp Tyr Gly Ile Ala Cys Cys Val Ser 405 410 415	1248
gcg atg cga atc ggc aaa caa atg caa ttt ttc gga gcg cgc gcc aac Ala Met Arg Ile Gly Lys Gln Met Gln Phe Phe Gly Ala Arg Ala Asn 420 425 430	1296
ctc gcc aaa gca ttg tta tat gcg att aac ggc ggc gtc gat gaa aaa Leu Ala Lys Ala Leu Leu Tyr Ala Ile Asn Gly Gly Val Asp Glu Lys 435 440 445	1344
ttg aaa atc caa gtt ggc cct gaa ttt gcg ccg att acc tcc gaa tat Leu Lys Ile Gln Val Gly Pro Glu Phe Ala Pro Ile Thr Ser Glu Tyr 450 455 460	1392
tta aat tat gat gaa gtg atg cat aaa ttc gat caa gtg ctt gaa tgg Leu Asn Tyr Asp Glu Val Met His Lys Phe Asp Gln Val Leu Glu Trp 465 470 475 480	1440
ctt gcc gaa ctt tat att aac aca ctg aat gtc atc cat tac atg cac Leu Ala Glu Leu Tyr Ile Asn Thr Leu Asn Val Ile His Tyr Met His 485 490 495	1488
gac aaa tat tgt tat gaa cgc att gaa atg gcg ctt cac gat act cac Asp Lys Tyr Cys Tyr Glu Arg Ile Glu Met Ala Leu His Asp Thr His 500 505 510	1536
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gaa aac ggc att gct gtt gat ttt gaa atg gaa ggc gac ttc ccg aaa Glu Asn Gly Ile Ala Val Asp Phe Glu Met Glu Gly Asp Phe Pro Lys 545 550 555 560	1680
tac gga aat aac gat gat cgc gtc gac caa att gcc gtt gat tta gtc Tyr Gly Asn Asn Asp Asp Arg Val Asp Gln Ile Ala Val Asp Leu Val 565 570 575	1728
gaa cgt ttt atg acg aaa ttg aaa aaa cat aaa aca tat cgc gat tcg Glu Arg Phe Met Thr Lys Leu Lys Lys His Lys Thr Tyr Arg Asp Ser 580 585 590	1776
aaa cat acg cta tct att tta aca att acg tct aac gtt gta tac ggg Lys His Thr Leu Ser Ile Leu Thr Ile Thr Ser Asn Val Val Tyr Gly 595 600 605	1824

aaa aag acc gga aat aca cca gat ggc cgc cgc gct ggc gaa ccg ttt 1872
 Lys Lys Thr Gly Asn Thr Pro Asp Gly Arg Arg Ala Gly Glu Pro Phe
 610 615 620

gcc cca gga gca aac ccg ttg cac ggc cgt gac acg aaa gga gcg ctc 1920
 Ala Pro Gly Ala Asn Pro Leu His Gly Arg Asp Thr Lys Gly Ala Leu
 625 630 635 640

gct tcg cta agc tct gtc gcg aaa tta cca tat gaa cat gca tta gat 1968
 Ala Ser Leu Ser Ser Val Ala Lys Leu Pro Tyr Glu His Ala Leu Asp
 645 650 655

ggc att tcg aat acg ttc tcg atc gtg ccg aaa gcg tta gga aaa gag 2016
 Gly Ile Ser Asn Thr Phe Ser Ile Val Pro Lys Ala Leu Gly Lys Glu
 660 665 670

gaa gga gac cgt gtc cgc aac ctt gtc gcc gtt tta gac gga tac atg 2064
 Glu Gly Asp Arg Val Arg Asn Leu Val Ala Val Leu Asp Gly Tyr Met
 675 680 685

gaa aaa ggc ggg cat cat ctc aac att aac gtg ttg aac cgc gaa aca 2112
 Glu Lys Gly Gly His His Leu Asn Ile Asn Val Leu Asn Arg Glu Thr
 690 695 700

ttg tta gat gcg atg gaa cat cca gaa aaa tat ccg caa tta acg att 2160
 Leu Leu Asp Ala Met Glu His Pro Glu Lys Tyr Pro Gln Leu Thr Ile
 705 710 715 720

cgc gtt tct gga tat gcc gtc aac ttc ata aaa tta acg cgc gaa caa 2208
 Arg Val Ser Gly Tyr Ala Val Asn Phe Ile Lys Leu Thr Arg Glu Gln
 725 730 735

caa atc gat gtc att aac cgc acg ttc cac gaa acg atg taa 2250
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 740 745

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<400> 42

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 35 40 45

Ala Thr Lys Lys Leu Trp Glu Gln Val Met Glu Leu Ser Lys Gln Glu
 50 55 60

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

290		295		300
Val Met Lys Leu Arg Leu Val Lys Phe Ala Arg Thr Pro Glu Tyr Asn				
305		310	315	320
Glu Leu Phe Ser Gly Asp Pro Thr Trp Val Thr Glu Ser Ile Gly Gly				
	325		330	335
Ile Ala Ile Asp Gly Arg Pro Leu Val Thr Lys Asn Ser Phe Arg Phe				
	340		345	350
Leu His Thr Leu Asp Asn Leu Gly Pro Ala Pro Glu Pro Asn Leu Thr				
	355		360	365
Val Leu Trp Ser Lys Gln Leu Pro Glu Ala Phe Lys Glu Tyr Cys Ala				
	370		375	380
Lys Met Ser Ile Lys Thr Ser Ser Ile Gln Tyr Glu Asn Asp Asp Leu				
385		390	395	400
Met Arg Val Glu Phe Gly Asp Asp Tyr Gly Ile Ala Cys Cys Val Ser				
	405		410	415
Ala Met Arg Ile Gly Lys Gln Met Gln Phe Phe Gly Ala Arg Ala Asn				
	420		425	430
Leu Ala Lys Ala Leu Leu Tyr Ala Ile Asn Gly Gly Val Asp Glu Lys				
	435		440	445
Leu Lys Ile Gln Val Gly Pro Glu Phe Ala Pro Ile Thr Ser Glu Tyr				
	450		455	460
Leu Asn Tyr Asp Glu Val Met His Lys Phe Asp Gln Val Leu Glu Trp				
465		470	475	480
Leu Ala Glu Leu Tyr Ile Asn Thr Leu Asn Val Ile His Tyr Met His				
	485		490	495
Asp Lys Tyr Cys Tyr Glu Arg Ile Glu Met Ala Leu His Asp Thr His				
	500		505	510
Val Leu Arg Thr Met Ala Thr Gly Ile Ala Gly Leu Ser Val Val Val				
	515		520	525

Asp Ser Leu Ser Ala Ile Lys Tyr Ala Lys Val Lys Pro Ile Arg Asp
 530 535 540

Glu Asn Gly Ile Ala Val Asp Phe Glu Met Glu Gly Asp Phe Pro Lys
 545 550 555 560

Tyr Gly Asn Asn Asp Asp Arg Val Asp Gln Ile Ala Val Asp Leu Val
 565 570 575

Glu Arg Phe Met Thr Lys Leu Lys Lys His Lys Thr Tyr Arg Asp Ser
 580 585 590

Lys His Thr Leu Ser Ile Leu Thr Ile Thr Ser Asn Val Val Tyr Gly
 595 600 605

Lys Lys Thr Gly Asn Thr Pro Asp Gly Arg Arg Ala Gly Glu Pro Phe
 610 615 620

Ala Pro Gly Ala Asn Pro Leu His Gly Arg Asp Thr Lys Gly Ala Leu
 625 630 635 640

Ala Ser Leu Ser Ser Val Ala Lys Leu Pro Tyr Glu His Ala Leu Asp
 645 650 655

Gly Ile Ser Asn Thr Phe Ser Ile Val Pro Lys Ala Leu Gly Lys Glu
 660 665 670

Glu Gly Asp Arg Val Arg Asn Leu Val Ala Val Leu Asp Gly Tyr Met
 675 680 685

Glu Lys Gly Gly His His Leu Asn Ile Asn Val Leu Asn Arg Glu Thr
 690 695 700

Leu Leu Asp Ala Met Glu His Pro Glu Lys Tyr Pro Gln Leu Thr Ile
 705 710 715 720

Arg Val Ser Gly Tyr Ala Val Asn Phe Ile Lys Leu Thr Arg Glu Gln
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atg att gat gag ctt gtc gct aat gca cag aaa gcg ttg gaa caa att	96
Met Ile Asp Glu Leu Val Ala Asn Ala Gln Lys Ala Leu Glu Gln Ile	
20 25 30	
cgc gct tac gat caa gaa acg atc gat cat atc gtg aaa gaa atg gcg	144
Arg Ala Tyr Asp Gln Glu Thr Ile Asp His Ile Val Lys Glu Met Ala	
35 40 45	
tta gcc ggg ctc gac aag cat atg gca tta gcc aag ctt gca gta gaa	192
Leu Ala Gly Leu Asp Lys His Met Ala Leu Ala Lys Leu Ala Val Glu	
50 55 60	
gaa aca aaa cgc ggt gta tat gaa gat aaa atc ata aaa aac ctt ttt	240
Glu Thr Lys Arg Gly Val Tyr Glu Asp Lys Ile Ile Lys Asn Leu Phe	
65 70 75 80	
gcg aca gaa tat ata tac cac aat att aag tat gat aaa aca gtc ggg	288
Ala Thr Glu Tyr Ile Tyr His Asn Ile Lys Tyr Asp Lys Thr Val Gly	
85 90 95	
att att cat gaa aat ccg cat gaa gaa att atc gaa att gct gag cct	336
Ile Ile His Glu Asn Pro His Glu Glu Ile Ile Glu Ile Ala Glu Pro	
100 105 110	
gtt ggt gtt att gct ggg att acg cca gtg aca aac ccg aca tcg aca	384
Val Gly Val Ile Ala Gly Ile Thr Pro Val Thr Asn Pro Thr Ser Thr	
115 120 125	
acg atg ttt aaa gcg tta atc tcg ata aaa aca cgc aac ccg att att	432
Thr Met Phe Lys Ala Leu Ile Ser Ile Lys Thr Arg Asn Pro Ile Ile	
130 135 140	
ttc gct ttc cat cca tcg gcg caa cga tgc agc agc gaa gcg gca aga	480
Phe Ala Phe His Pro Ser Ala Gln Arg Cys Ser Ser Glu Ala Ala Arg	
145 150 155 160	
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Val Leu Arg Asp Ala Ala Val Arg Ala Gly Ala Pro Glu His Cys Ile	
165 170 175	
caa tgg att gaa act cct tcg ctt gat gca acc aat cag ctt atg cac	576
Gln Trp Ile Glu Thr Pro Ser Leu Asp Ala Thr Asn Gln Leu Met His	
180 185 190	
cat cct ggc gtt tct ctc att ttg gca act ggt ggc gcc gcc atg gtg	624
His Pro Gly Val Ser Leu Ile Leu Ala Thr Gly Gly Ala Gly Met Val	
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aat gtg cct tgc tat att gaa aaa acg gca aac ata aaa cgg gcg gta Asn Val Pro Cys Tyr Ile Glu Lys Thr Ala Asn Ile Lys Arg Ala Val 225 230 235 240	720
aat gac tta att tta tcg aaa acg ttt gat aac ggc atg att tgc gct Asn Asp Leu Ile Leu Ser Lys Thr Phe Asp Asn Gly Met Ile Cys Ala 245 250 255	768
tct gaa caa gca gtc att att gat aaa gaa att tat gaa caa gta aag Ser Glu Gln Ala Val Ile Ile Asp Lys Glu Ile Tyr Glu Gln Val Lys 260 265 270	816
aaa gaa atg ata gaa aac cat tgt tat ttc tta aat gaa gaa gaa aag Lys Glu Met Ile Glu Asn His Cys Tyr Phe Leu Asn Glu Glu Glu Lys 275 280 285	864
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ccg gat atc gtc gga aag cca gct tat gaa att gcg aaa atg gcc ggc Pro Asp Ile Val Gly Lys Pro Ala Tyr Glu Ile Ala Lys Met Ala Gly 305 310 315 320	960
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gct tgc tat aaa gtt aac agc acg gaa gaa gga ttt aag cgc tgt gaa Ala Cys Tyr Lys Val Asn Ser Thr Glu Glu Gly Phe Lys Arg Cys Glu 355 360 365	1104
gaa atg ctg gaa ttt ggc ggc ttg gga cat tcg gct gtc atc cat tcc Glu Met Leu Glu Phe Gly Gly Leu Gly His Ser Ala Val Ile His Ser 370 375 380	1152
gat aat caa aac gtg gtt acc gaa ttt ggc aaa cgg atg aaa gcg gga Asp Asn Gln Asn Val Val Thr Glu Phe Gly Lys Arg Met Lys Ala Gly 385 390 395 400	1200
cgg att atc gtt aat gcg cca tct tcg caa gga gca atc ggc gat att Arg Ile Ile Val Asn Ala Pro Ser Ser Gln Gly Ala Ile Gly Asp Ile 405 410 415	1248
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gga aac tct gtt tcg aca aac gtc agt gcg att cat ctt atc aat ata Gly Asn Ser Val Ser Thr Asn Val Ser Ala Ile His Leu Ile Asn Ile 435 440 445	1344

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ctc gga tat gtc gat aaa gtg ctg tat tac ttg cgc aga cgc ccg gat Leu Gly Tyr Val Asp Lys Val Leu Tyr Tyr Leu Arg Arg Arg Pro Asp 500 505 510			1536
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gga atg gat gta ttg aca cat gcg atc gaa gcg tat gtc tcc aat atg Gly Met Asp Val Leu Thr His Ala Ile Glu Ala Tyr Val Ser Asn Met 660 665 670			2016
gca aat gat tat acc gat ggt ctt gcc atg aaa gca atc caa ctc gta			2064

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Phe	Glu	Tyr	Leu	Pro	Arg	Ala	Tyr	Gln	Asn	Gly	Ala	Asp	Glu	Leu	Ala	
	690					695					700					
cgg	gag	aaa	atg	cat	aac	gcc	tct	acg	att	gcg	gga	atg	gca	ttt	gcc	2160
Arg	Glu	Lys	Met	His	Asn	Ala	Ser	Thr	Ile	Ala	Gly	Met	Ala	Phe	Ala	
705					710					715					720	
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Asn	Ala	Phe	Leu	Gly	Ile	Asn	His	Ser	Leu	Ala	His	Lys	Leu	Gly	Ala	
				725					730					735		
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Glu	Phe	His	Ile	Pro	His	Gly	Arg	Ala	Asn	Thr	Ile	Leu	Met	Pro	His	
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Val	Ile	Arg	Tyr	Asn	Ala	Ala	Lys	Pro	Lys	Lys	Phe	Thr	Ala	Phe	Pro	
		755					760					765				
aaa	tac	gaa	tat	ttc	aaa	gcg	gac	cag	cgc	tat	gca	gaa	att	gcg	aga	2352
Lys	Tyr	Glu	Tyr	Phe	Lys	Ala	Asp	Gln	Arg	Tyr	Ala	Glu	Ile	Ala	Arg	
	770					775					780					
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Met	Leu	Gly	Leu	Pro	Ala	Arg	Thr	Thr	Glu	Glu	Gly	Val	Glu	Ser	Leu	
785					790					795					800	
gtt	cag	gcg	atc	att	aag	ctg	gca	aaa	cag	ttg	gat	atg	ccg	ctg	agc	2448
Val	Gln	Ala	Ile	Ile	Lys	Leu	Ala	Lys	Gln	Leu	Asp	Met	Pro	Leu	Ser	
				805					810					815		
att	gaa	gca	tgc	ggc	gtc	agc	aaa	caa	gaa	ttt	gaa	agc	aaa	gtt	gaa	2496
Ile	Glu	Ala	Cys	Gly	Val	Ser	Lys	Gln	Glu	Phe	Glu	Ser	Lys	Val	Glu	
			820					825					830			
aaa	tta	gcc	gaa	ttg	gct	ttc	gaa	gac	caa	tgt	act	act	gct	aac	ccg	2544
Lys	Leu	Ala	Glu	Leu	Ala	Phe	Glu	Asp	Gln	Cys	Thr	Thr	Ala	Asn	Pro	
		835					840					845				
aaa	ctc	ccg	ctt	gtt	agc	gat	tta	gtt	cat	att	tat	cgc	caa	gcg	ttt	2592
Lys	Leu	Pro	Leu	Val	Ser	Asp	Leu	Val	His	Ile	Tyr	Arg	Gln	Ala	Phe	
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aaa	gga	gtt	taa													2604
Lys	Gly	Val														
865																

<210> 44
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 <400> 44

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

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

Pro Asp Ile Ser Arg Ala Phe Ile Val Thr Asp Pro Gly Met Val Lys
 485 490 495

Leu Gly Tyr Val Asp Lys Val Leu Tyr Tyr Leu Arg Arg Arg Pro Asp
 500 505 510

Tyr Val His Ser Glu Ile Phe Ser Glu Val Glu Pro Asp Pro Ser Ile
 515 520 525

Glu Thr Val Met Lys Gly Val Asp Met Met Arg Ser Phe Glu Pro Asp
 530 535 540

Val Ile Ile Ala Leu Gly Gly Gly Ser Pro Met Asp Ala Ala Lys Ala
 545 550 555 560

Met Trp Leu Phe Tyr Glu His Pro Thr Ala Asp Phe Asn Ala Leu Lys
 565 570 575

Gln Lys Phe Leu Asp Ile Arg Lys Arg Val Tyr Lys Tyr Pro Lys Leu
 580 585 590

Gly Gln Lys Ala Lys Phe Val Ala Ile Pro Thr Thr Ser Gly Thr Gly
 595 600 605

Ser Glu Val Thr Ser Phe Ala Val Ile Thr Asp Lys Lys Thr Asn Ile
 610 615 620

Lys Tyr Pro Leu Ala Asp Tyr Glu Leu Thr Pro Asp Val Ala Ile Val
 625 630 635 640

Asp Pro Gln Phe Val Met Thr Val Pro Lys His Val Thr Ala Asp Thr
 645 650 655

Gly Met Asp Val Leu Thr His Ala Ile Glu Ala Tyr Val Ser Asn Met
 660 665 670

Ala Asn Asp Tyr Thr Asp Gly Leu Ala Met Lys Ala Ile Gln Leu Val
 675 680 685

Phe Glu Tyr Leu Pro Arg Ala Tyr Gln Asn Gly Ala Asp Glu Leu Ala
 690 695 700

Arg Glu Lys Met His Asn Ala Ser Thr Ile Ala Gly Met Ala Phe Ala

705						710						715						720
Asn	Ala	Phe	Leu	Gly	Ile	Asn	His	Ser	Leu	Ala	His	Lys	Leu	Gly	Ala			
				725					730				735					
Glu	Phe	His	Ile	Pro	His	Gly	Arg	Ala	Asn	Thr	Ile	Leu	Met	Pro	His			
				740					745				750					
Val	Ile	Arg	Tyr	Asn	Ala	Ala	Lys	Pro	Lys	Lys	Phe	Thr	Ala	Phe	Pro			
				755					760				765					
Lys	Tyr	Glu	Tyr	Phe	Lys	Ala	Asp	Gln	Arg	Tyr	Ala	Glu	Ile	Ala	Arg			
				770					775				780					
Met	Leu	Gly	Leu	Pro	Ala	Arg	Thr	Thr	Glu	Glu	Gly	Val	Glu	Ser	Leu			
				785					790				795					
Val	Gln	Ala	Ile	Ile	Lys	Leu	Ala	Lys	Gln	Leu	Asp	Met	Pro	Leu	Ser			
				805					810				815					
Ile	Glu	Ala	Cys	Gly	Val	Ser	Lys	Gln	Glu	Phe	Glu	Ser	Lys	Val	Glu			
				820					825				830					
Lys	Leu	Ala	Glu	Leu	Ala	Phe	Glu	Asp	Gln	Cys	Thr	Thr	Ala	Asn	Pro			
				835					840				845					
Lys	Leu	Pro	Leu	Val	Ser	Asp	Leu	Val	His	Ile	Tyr	Arg	Gln	Ala	Phe			
				850					855				860					
Lys	Gly	Val																
865																		

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<213>	Geobacillus thermoglucosidans

<220>
<221> CDS
<222> (1) .. (423)

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Val Arg Ile Ala Leu Ile Ala His Asp Lys Lys Lys Ala Asp Met Ile
1               5               10               15

gaa ttt gtg act gcc tat cag ccg att tta gaa caa cat gaa ctg tat           96

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Glu	Phe	Val	Thr	Ala	Tyr	Gln	Pro	Ile	Leu	Glu	Gln	His	Glu	Leu	Tyr	
			20					25					30			
gcg	acg	ggc	acg	acc	ggc	ttg	cgc	att	cag	gaa	gcg	aca	gga	ctg	ccg	144
Ala	Thr	Gly	Thr	Thr	Gly	Leu	Arg	Ile	Gln	Glu	Ala	Thr	Gly	Leu	Pro	
		35					40					45				
gtg	cat	cgc	ttt	caa	tcg	ggg	cca	tat	ggc	ggc	gat	caa	gaa	att	ggc	192
Val	His	Arg	Phe	Gln	Ser	Gly	Pro	Tyr	Gly	Gly	Asp	Gln	Glu	Ile	Gly	
	50					55					60					
gca	atg	att	gcc	cgc	aat	gaa	atg	gat	atg	gtg	ata	ttt	ttc	cgc	gat	240
Ala	Met	Ile	Ala	Arg	Asn	Glu	Met	Asp	Met	Val	Ile	Phe	Phe	Arg	Asp	
65					70					75					80	
ccg	ttg	acg	gca	cag	ccg	cat	gag	ccg	gat	gtc	agt	gcg	ctc	att	cgc	288
Pro	Leu	Thr	Ala	Gln	Pro	His	Glu	Pro	Asp	Val	Ser	Ala	Leu	Ile	Arg	
				85					90					95		
tta	tgt	gat	gtc	tat	tcc	gtg	ccg	ctt	gca	acc	aat	atg	ggg	acg	gcg	336
Leu	Cys	Asp	Val	Tyr	Ser	Val	Pro	Leu	Ala	Thr	Asn	Met	Gly	Thr	Ala	
			100					105					110			
gaa	att	tta	att	aaa	ggg	ctg	gag	cgc	ggc	gat	ttt	gcg	tgg	agg	aat	384
Glu	Ile	Leu	Ile	Lys	Gly	Leu	Glu	Arg	Gly	Asp	Phe	Ala	Trp	Arg	Asn	
		115					120					125				
att	gtc	cgc	ggc	cga	aaa	ggc	gag	aca	aat	gga	ata	taa				423
Ile	Val	Arg	Gly	Arg	Lys	Gly	Glu	Thr	Asn	Gly	Ile					
	130					135					140					
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<211>	140															
<212>	PRT															
<213>	Geobacillus thermoglucosidans															
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Val	Arg	Ile	Ala	Leu	Ile	Ala	His	Asp	Lys	Lys	Lys	Ala	Asp	Met	Ile	
1				5					10					15		
Glu	Phe	Val	Thr	Ala	Tyr	Gln	Pro	Ile	Leu	Glu	Gln	His	Glu	Leu	Tyr	
			20					25					30			
Ala	Thr	Gly	Thr	Thr	Gly	Leu	Arg	Ile	Gln	Glu	Ala	Thr	Gly	Leu	Pro	
		35					40					45				
Val	His	Arg	Phe	Gln	Ser	Gly	Pro	Tyr	Gly	Gly	Asp	Gln	Glu	Ile	Gly	
	50					55					60					
Ala	Met	Ile	Ala	Arg	Asn	Glu	Met	Asp	Met	Val	Ile	Phe	Phe	Arg	Asp	
65					70					75					80	

Pro Leu Thr Ala Gln Pro His Glu Pro Asp Val Ser Ala Leu Ile Arg
85 90 95

Leu Cys Asp Val Tyr Ser Val Pro Leu Ala Thr Asn Met Gly Thr Ala
100 105 110

Glu Ile Leu Ile Lys Gly Leu Glu Arg Gly Asp Phe Ala Trp Arg Asn
115 120 125

Ile Val Arg Gly Arg Lys Gly Glu Thr Asn Gly Ile
130 135 140

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<211> 960
<212> DNA
<213> Geobacillus thermoglucosidans

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<222> (1)..(960)

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ggt ggg gcc agc tat gca ttt gcc ctt atg aac caa gga ata gca gat 96
Val Gly Ala Ser Tyr Ala Phe Ala Leu Met Asn Gln Gly Ile Ala Asp
20 25 30
gag tta gta ttg att gat gta aat aag aat aag gca gag ggc gat gtg 144
Glu Leu Val Leu Ile Asp Val Asn Lys Asn Lys Ala Glu Gly Asp Val
35 40 45
atg gat tta aat cac gga aaa gta ttc gcg ccg aag ccg atg aat att 192
Met Asp Leu Asn His Gly Lys Val Phe Ala Pro Lys Pro Met Asn Ile
50 55 60
tgg ttt gga gat tat caa gat tgc caa gac gcc gat ttg gtg gtg att 240
Trp Phe Gly Asp Tyr Gln Asp Cys Gln Asp Ala Asp Leu Val Val Ile
65 70 75 80
tgt gca ggg gct aac caa aag ccg gga gaa aca aga ctg gat ctt gtt 288
Cys Ala Gly Ala Asn Gln Lys Pro Gly Glu Thr Arg Leu Asp Leu Val
85 90 95
gac aaa aat att aat atc ttc aaa acg att gtc gat tct gtg atg aaa 336
Asp Lys Asn Ile Asn Ile Phe Lys Thr Ile Val Asp Ser Val Met Lys
100 105 110
tcc gga ttt gat ggc gtt ttt ctt gtg gca acg aac cca gtg gat att 384
Ser Gly Phe Asp Gly Val Phe Leu Val Ala Thr Asn Pro Val Asp Ile
115 120 125

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tta acg tat gct act tgg aaa ttt agc ggg tta ccg aaa gag cgg gta      432
Leu Thr Tyr Ala Thr Trp Lys Phe Ser Gly Leu Pro Lys Glu Arg Val
    130                      135                      140

atc ggc tca gga acg att ctt gat aca gca aga ttc cgc ttc ttg cta      480
Ile Gly Ser Gly Thr Ile Leu Asp Thr Ala Arg Phe Arg Phe Leu Leu
    145                      150                      155                      160

agt gaa tat ttt caa gtg gct ccg acc aat gta cat gcg tat att att      528
Ser Glu Tyr Phe Gln Val Ala Pro Thr Asn Val His Ala Tyr Ile Ile
                      165                      170                      175

ggc gag cat ggg gat aca gag ctg cct gtt tgg agc cat gcg gaa att      576
Gly Glu His Gly Asp Thr Glu Leu Pro Val Trp Ser His Ala Glu Ile
                      180                      185                      190

gga agc att cca gtt gag caa ata ttg atg caa aac gat aac tat aga      624
Gly Ser Ile Pro Val Glu Gln Ile Leu Met Gln Asn Asp Asn Tyr Arg
                      195                      200                      205

aaa gag gat tta gac aat atc ttt gtt aat gtt cgt gat gcg gca tat      672
Lys Glu Asp Leu Asp Asn Ile Phe Val Asn Val Arg Asp Ala Ala Tyr
    210                      215                      220

caa atc att gag aaa aaa ggg gca acg tat tac ggc att gca atg gga      720
Gln Ile Ile Glu Lys Lys Gly Ala Thr Tyr Tyr Gly Ile Ala Met Gly
    225                      230                      235                      240

tta gtc cgt atc act cgt gct att ttg cac aat gaa aat gcc atc tta      768
Leu Val Arg Ile Thr Arg Ala Ile Leu His Asn Glu Asn Ala Ile Leu
                      245                      250                      255

acc gtt tct gct cat ttg gac ggc caa tat ggc gaa cga aat gtt tat      816
Thr Val Ser Ala His Leu Asp Gly Gln Tyr Gly Glu Arg Asn Val Tyr
                      260                      265                      270

att ggc gtg cct gcc att atc aac cga aac ggt att cgt gaa gtg atg      864
Ile Gly Val Pro Ala Ile Ile Asn Arg Asn Gly Ile Arg Glu Val Met
    275                      280                      285

gaa ttg acg cta aat gaa aca gaa caa caa caa ttc cat cat agt gta      912
Glu Leu Thr Leu Asn Glu Thr Glu Gln Gln Gln Phe His His Ser Val
    290                      295                      300

act gta tta aaa gac att ctt tcc cgt tat ttt gat gat gta aaa taa      960
Thr Val Leu Lys Asp Ile Leu Ser Arg Tyr Phe Asp Asp Val Lys
    305                      310                      315

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<210> 48
<211> 319
<212> PRT
<213> Geobacillus thermoglucosidans

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<400> 48

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Met Lys Gln Gln Gly Met Asn Arg Val Ala Leu Ile Gly Thr Gly Phe
1                      5                      10                      15

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

Thr Val Ser Ala His Leu Asp Gly Gln Tyr Gly Glu Arg Asn Val Tyr
260 265 270

Ile Gly Val Pro Ala Ile Ile Asn Arg Asn Gly Ile Arg Glu Val Met
275 280 285

Glu Leu Thr Leu Asn Glu Thr Glu Gln Gln Gln Phe His His Ser Val
290 295 300

Thr Val Leu Lys Asp Ile Leu Ser Arg Tyr Phe Asp Asp Val Lys
305 310 315

<210> 49
<211> 975
<212> DNA
<213> Geobacillus thermoglucosidans

<220>
<221> CDS
<222> (1)..(975)

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Val Ser Ser Asp Leu Phe Ser Thr Leu Lys Glu Lys Ile Ala Gly Lys
1 5 10 15
caa cgg aaa atc gtg ttt ccg gaa ggg ctt gat gag cgt att tta aca 96
Gln Arg Lys Ile Val Phe Pro Glu Gly Leu Asp Glu Arg Ile Leu Thr
20 25 30
gcg gta agc cgt ctg gcg aac gag caa atc gtc acg ccg att gtc att 144
Ala Val Ser Arg Leu Ala Asn Glu Gln Ile Val Thr Pro Ile Val Ile
35 40 45
ggc aat gaa gaa gcg gtt aag caa aaa gca agc gag ctt ggg ctg acg 192
Gly Asn Glu Glu Ala Val Lys Gln Lys Ala Ser Glu Leu Gly Leu Thr
50 55 60
ctt ccg aat gtc gaa atc att gat ccg cat cag tac ggg gaa atg gac 240
Leu Pro Asn Val Glu Ile Ile Asp Pro His Gln Tyr Gly Glu Met Asp
65 70 75 80
aag ctt gtt gcg gca ttt gtc gaa cgc cgc aaa ggg aaa gtg acg gaa 288
Lys Leu Val Ala Ala Phe Val Glu Arg Arg Lys Gly Lys Val Thr Glu
85 90 95
gaa gcg gcg cgg aag ctg ctt ctt gac gaa aat tat ttt ggc acc atg 336
Glu Ala Ala Arg Lys Leu Leu Leu Asp Glu Asn Tyr Phe Gly Thr Met
100 105 110
ctt gtg tac atg gat aag gcg cat ggg ctt gtc agc ggc gcg gcg cat 384
Leu Val Tyr Met Asp Lys Ala His Gly Leu Val Ser Gly Ala Ala His

115	120	125	
tcg acg gct gat acg gtg cgg cct gcg ttg caa att ata aaa acg aaa Ser Thr Ala Asp Thr Val Arg Pro Ala Leu Gln Ile Ile Lys Thr Lys 130 135 140			432
caa ggc gtc cgc aaa acg tca gga gta ttc att atg gtg cgc ggt gat Gln Gly Val Arg Lys Thr Ser Gly Val Phe Ile Met Val Arg Gly Asp 145 150 155 160			480
gaa aag tac gtg ttt gcc gat tgc gcg atc aac att gcc ccg gac agc Glu Lys Tyr Val Phe Ala Asp Cys Ala Ile Asn Ile Ala Pro Asp Ser 165 170 175			528
caa gat ttg gcg gaa atc gct gtc gaa agc gcc aac acg gca aaa atg Gln Asp Leu Ala Glu Ile Ala Val Glu Ser Ala Asn Thr Ala Lys Met 180 185 190			576
ttc gac att gag ccg cgc gtg gcg atg ttg agc ttt tcg aca aaa gga Phe Asp Ile Glu Pro Arg Val Ala Met Leu Ser Phe Ser Thr Lys Gly 195 200 205			624
tca gcg aaa tcg cca gaa acg gaa aaa gtc gtc gaa gcg gtg cgg ctt Ser Ala Lys Ser Pro Glu Thr Glu Lys Val Val Glu Ala Val Arg Leu 210 215 220			672
gcg aaa gaa atg gcg cct gac tta gtg ctg gac ggt gag ttt cag ttc Ala Lys Glu Met Ala Pro Asp Leu Val Leu Asp Gly Glu Phe Gln Phe 225 230 235 240			720
gac gcg gcg ttt gtt ccg tct gtc gcg aaa aag aaa gcg cca gat tcc Asp Ala Ala Phe Val Pro Ser Val Ala Lys Lys Lys Ala Pro Asp Ser 245 250 255			768
gtc att caa gga gac gcg aac gta ttt att ttc cca agc ctt gaa gcg Val Ile Gln Gly Asp Ala Asn Val Phe Ile Phe Pro Ser Leu Glu Ala 260 265 270			816
gga aat atc ggc tat aaa atc gcc cag cgt ctc ggc aac ttt gaa gcg Gly Asn Ile Gly Tyr Lys Ile Ala Gln Arg Leu Gly Asn Phe Glu Ala 275 280 285			864
gtc ggc ccg att ttg caa gga ctc aat aag cct gtg aac gac ctg tca Val Gly Pro Ile Leu Gln Gly Leu Asn Lys Pro Val Asn Asp Leu Ser 290 295 300			912
cgc ggt tgc aat gcg gaa gat gtg tac aag ctg acg ctt ata act gcg Arg Gly Cys Asn Ala Glu Asp Val Tyr Lys Leu Thr Leu Ile Thr Ala 305 310 315 320			960
gcg caa tcg cta taa Ala Gln Ser Leu			975

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 <211> 324
 <212> PRT
 <213> Geobacillus thermoglucosidans

<400> 50

Val Ser Ser Asp Leu Phe Ser Thr Leu Lys Glu Lys Ile Ala Gly Lys
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Gln Arg Lys Ile Val Phe Pro Glu Gly Leu Asp Glu Arg Ile Leu Thr
 20 25 30

Ala Val Ser Arg Leu Ala Asn Glu Gln Ile Val Thr Pro Ile Val Ile
 35 40 45

Gly Asn Glu Glu Ala Val Lys Gln Lys Ala Ser Glu Leu Gly Leu Thr
 50 55 60

Leu Pro Asn Val Glu Ile Ile Asp Pro His Gln Tyr Gly Glu Met Asp
 65 70 75 80

Lys Leu Val Ala Ala Phe Val Glu Arg Arg Lys Gly Lys Val Thr Glu
 85 90 95

Glu Ala Ala Arg Lys Leu Leu Leu Asp Glu Asn Tyr Phe Gly Thr Met
 100 105 110

Leu Val Tyr Met Asp Lys Ala His Gly Leu Val Ser Gly Ala Ala His
 115 120 125

Ser Thr Ala Asp Thr Val Arg Pro Ala Leu Gln Ile Ile Lys Thr Lys
 130 135 140

Gln Gly Val Arg Lys Thr Ser Gly Val Phe Ile Met Val Arg Gly Asp
 145 150 155 160

Glu Lys Tyr Val Phe Ala Asp Cys Ala Ile Asn Ile Ala Pro Asp Ser
 165 170 175

Gln Asp Leu Ala Glu Ile Ala Val Glu Ser Ala Asn Thr Ala Lys Met
 180 185 190

Phe Asp Ile Glu Pro Arg Val Ala Met Leu Ser Phe Ser Thr Lys Gly
 195 200 205

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

Ala Lys Glu Met Ala Pro Asp Leu Val Leu Asp Gly Glu Phe Gln Phe
 225 230 235 240

Asp Ala Ala Phe Val Pro Ser Val Ala Lys Lys Lys Ala Pro Asp Ser
 245 250 255

Val Ile Gln Gly Asp Ala Asn Val Phe Ile Phe Pro Ser Leu Glu Ala
 260 265 270

Gly Asn Ile Gly Tyr Lys Ile Ala Gln Arg Leu Gly Asn Phe Glu Ala
 275 280 285

Val Gly Pro Ile Leu Gln Gly Leu Asn Lys Pro Val Asn Asp Leu Ser
 290 295 300

Arg Gly Cys Asn Ala Glu Asp Val Tyr Lys Leu Thr Leu Ile Thr Ala
 305 310 315 320

Ala Gln Ser Leu

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 <212> DNA
 <213> Geobacillus thermoglucosidans

<220>
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 <222> (1)..(750)

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 atg aaa aag ctt att cgc cgc agc caa gag ggg gac caa cag gcg cgc 96
 Met Lys Lys Leu Ile Arg Arg Ser Gln Glu Gly Asp Gln Gln Ala Arg
 20 25 30
 aat gaa att atc caa aaa aac atg cgc ctc gtt tgg tcg gtc gtc cag 144
 Asn Glu Ile Ile Gln Lys Asn Met Arg Leu Val Trp Ser Val Val Gln
 35 40 45
 cgc ttt ttg aac cgc gga tac gag ccg gac gat tta ttt caa att ggc 192
 Arg Phe Leu Asn Arg Gly Tyr Glu Pro Asp Asp Leu Phe Gln Ile Gly
 50 55 60
 tgc atc ggc ttg ctt aaa tct gtt gat aag ttt gat ttg tcg tat gac 240
 Cys Ile Gly Leu Leu Lys Ser Val Asp Lys Phe Asp Leu Ser Tyr Asp
 65 70 75 80

gtg aag ttt tcc aca tat gcg gtg ccg atg atc atc ggc gaa att cag 288
Val Lys Phe Ser Thr Tyr Ala Val Pro Met Ile Ile Gly Glu Ile Gln
85 90 95

cgg ttt atc cgc gat gac ggg acg gtg aaa gtg agc cgt tcc tta aaa 336
Arg Phe Ile Arg Asp Asp Gly Thr Val Lys Val Ser Arg Ser Leu Lys
100 105 110

gaa acg ggc aat aaa atc cgg aaa gca aga gac gag ctt tcg aaa aaa 384
Glu Thr Gly Asn Lys Ile Arg Lys Ala Arg Asp Glu Leu Ser Lys Lys
115 120 125

cat gga cgg gcg cca acg gtg aca gaa atc gcc gat tat tta gaa att 432
His Gly Arg Ala Pro Thr Val Thr Glu Ile Ala Asp Tyr Leu Glu Ile
130 135 140

tct cca gaa gaa gtg gtg ctt gcc cag gaa gcc gtt cgt tcc ccg gct 480
Ser Pro Glu Glu Val Val Leu Ala Gln Glu Ala Val Arg Ser Pro Ala
145 150 155 160

tcc att cac gaa aca gtg tat gaa aac gac ggc gac ccg atc acg ctc 528
Ser Ile His Glu Thr Val Tyr Glu Asn Asp Gly Asp Pro Ile Thr Leu
165 170 175

ctc gat caa att gct gat gcc gac gaa gca tca tgg ttt gat aaa atc 576
Leu Asp Gln Ile Ala Asp Ala Asp Glu Ala Ser Trp Phe Asp Lys Ile
180 185 190

gcg ttg aaa aaa gcg att gag gag ctg gat gaa cgg gaa cgt ctc atc 624
Ala Leu Lys Lys Ala Ile Glu Glu Leu Asp Glu Arg Glu Arg Leu Ile
195 200 205

gtc tat ttg cgt tat tac aaa gat caa acc cag tcg gaa gtg gca tca 672
Val Tyr Leu Arg Tyr Tyr Lys Asp Gln Thr Gln Ser Glu Val Ala Ser
210 215 220

aga tta ggc atc tct caa gtt caa gta tcc cgt ctt gaa aaa aaa att 720
Arg Leu Gly Ile Ser Gln Val Gln Val Ser Arg Leu Glu Lys Lys Ile
225 230 235 240

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<212> PRT

<213> *Geobacillus thermoglucosidans*

<400> 52

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20 25 30

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