

BPS64825PC-2008028659
SEQUENCE LISTING

<110> BASF Plant Science GmbH

<120> Seed enhancement by combinations of pyruvate kinases

<130> BPS64825EP

<160> 59

<170> PatentIn version 3.5

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<223> Pyruvate Kinase

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BPS64825PC-2008028659

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BPS64825PC-2008028659

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 Thr Ser Val Trp Leu Glu Val Glu Glu Val Lys Gly Asp Asp Val Ile
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 His Val Ser Gln Val His Ile Asp Met Pro Thr Leu Thr Glu Lys Asp
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 Ile Glu Asn Glu Glu Gly Leu Thr His Phe Asp Glu Ile Leu Gln Glu
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 Pro Glu Lys Val Phe Leu Phe Gln Lys Ala Ala Leu Tyr Lys Cys Asn
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 Asp Asn Leu Arg Pro Thr Arg Ala Glu Ala Thr Asp Val Ala Asn Ala
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 Gly Leu Tyr Pro Val Glu Thr Ile Ser Thr Val Gly Arg Ile Cys Cys
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 Glu Ala Glu Lys Val Phe Asn Gln Asp Leu Phe Phe Lys Lys Thr Val
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BPS64825PC-2008028659

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Lys Thr Lys 20 Ile Val Cys Thr Leu Gly 25 Pro Ala Ser Arg Ser Val Glu

atg gtt gag aag ctt ctc aaa gcc ggt atg aac gta gcc cgg ttc aac 144
Met Val Glu Lys Leu Leu Lys Ala Gly Met Asn Val Ala Arg Phe Asn 35 40 45

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Phe Ser His Gly Ser His Ser Tyr His Gln Glu Thr Leu Asp Asn Leu 50 55 60

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BPS64825PC-2008028659

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Gly 225	Glu	Asn	Ala	Lys	Ser 230	Ile	Met	Leu	Met	Ser 235	Lys	Val	Glu	Asn	Gln 240		
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BPS64825PC-2008028659

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BPS64825PC-2008028659

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BPS64825PC-2008028659

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Lys Thr Lys 20 Ile Val Cys Thr Leu 25 Gly Pro Ala Ser Arg 30 Ser Val Glu	
atg att gag aag ctt ctc aag gct ggt atg aac gta gcc cgg ttc aat	144
Met Ile 35 Glu Lys Leu Leu Lys 40 Ala Gly Met Asn Val 45 Ala Arg Phe Asn	
ttc tcc cat ggt tct cac tct tac cat caa gaa act ctc gat aat ctc	192
Phe Ser 50 His Gly Ser His 55 Ser Tyr His Gln Glu Thr 60 Leu Asp Asn Leu	
aga acc gcc atg gac aac act ggt atc ctc tgc gcc gtc atg ctc gac	240
Arg Thr Ala Met Asp 70 Asn Thr Gly Ile Leu 75 Cys Ala Val Met Leu 80 Asp	
aca aag agt cct gtg ata cga acc ggg ttt ctc aaa gaa ggc aaa ccg	288

BPS64825PC-2008028659

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ata Ile	caa Gln	gga Gly 115	gat Asp	tcc Ser	aac Asn	act Thr	atc Ile 120	tcc Ser	atg Met	agc Ser	tac Tyr	aag Lys 125	aaa Lys	ctt Leu	gca Ala	384
gag Glu	gat Asp 130	ctc Leu	aaa Lys	cct Pro	ggt Gly	gac Asp 135	gtg Val	atc Ile	ctt Leu	tgt Cys	tca Ser 140	gac Asp	gga Gly	aca Thr	atc Ile	432
tct Ser 145	cta Leu	aat Asn	gtc Val	ttg Leu	tcc Ser 150	tgt Cys	gac Asp	aag Lys	tat Tyr	ctc Leu 155	ggt Gly	ctt Leu	ggt Val	cgt Arg	tgc Cys 160	480
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cct Pro	gga Gly	att Ile	gta Val 180	ggt Val	gat Asp	ctc Leu	cca Pro	aca Thr 185	ctc Leu	act Thr	gag Glu	aaa Lys	gat Asp 190	aaa Lys	gaa Glu	576
gat Asp	att Ile	atg Met 195	caa Gln	tggt Trp	gga Gly	ggt Val	ccg Pro 200	aac Asn	aaa Lys	atc Ile	gac Asp	att Ile 205	atc Ile	gct Ala	ctc Leu	624
tct Ser	ttt Phe 210	ggt Val	cgt Arg	aaa Lys	gga Gly	tct Ser 215	gac Asp	cta Leu	atc Ile	caa Gln	gta Val 220	agg Arg	aaa Lys	tta Leu	ctt Leu	672
gga Gly 225	gag Glu	cac His	tca Ser	aag Lys	agc Ser 230	atc Ile	atg Met	ctt Leu	atg Met	tca Ser 235	aag Lys	gtg Val	gag Glu	aat Asn	caa Gln 240	720
gaa Glu	gga Gly	gta Val	atg Met	aat Asn 245	ttc Phe	gat Asp	aag Lys	atc Ile 250	ctg Leu	gag Glu	aat Asn	tct Ser	gat Asp	gct Ala 255	ttc Phe	768
atg Met	gtg Val	gct Ala 260	aga Arg	gga Gly	gat Asp	ctt Leu	ggg Gly 265	atg Met	gag Glu	ata Ile	cca Pro	atc Ile 270	gaa Glu	aag Lys	atg Met	816
ttt Phe	ctt Leu	gct Ala 275	cag Gln	aaa Lys	aca Thr	atg Met	atc Ile 280	aac Asn	aag Lys	gct Ala	aat Asn	gct Ala 285	cat His	ggg Gly	aaa Lys	864
cca Pro	gtg Val 290	gtc Val	aca Thr	gcc Ala	aca Thr	cag Gln 295	atg Met	ctt Leu	gaa Glu	tcc Ser	atg Met 300	aca Thr	gtc Val	tct Ser	cct Pro	912
cgc Arg 305	ccg Pro	act Thr	aga Arg	gct Ala	gaa Glu 310	gct Ala	acc Thr	gac Asp	gta Val	gca Ala 315	aac Asn	gcg Ala	ggt Val	ctt Leu	gac Asp 320	960
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cct Pro	gag Glu	act Thr	gcc Ala 340	gtg Val	tta Leu	aca Thr	atg Met	tca Ser 345	agg Arg	atc Ile	tgc Cys	aaa Lys	gaa Glu 350	gca Ala	gag Glu	1056
gat Asp	ttc Phe	ata Ile	gat Asp	tac Tyr	gac Asp	att Ile	ctc Leu	cac His	aag Lys	aaa Lys	acc Thr	cta Leu	gga Gly	atg Met	ggt Val	1104

BPS64825PC-2008028659

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Thr Ala Arg Ser Val Phe Ala Ser Ala Ile Val Val Leu Thr Arg Gly			
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ggt tac acg gcg gag ctt gtg gct aaa tac agg cca agc gtt ccg att			1248
Gly Tyr Thr Ala Glu Leu Val Ala Lys Tyr Arg Pro Ser Val Pro Ile			
405	410	415	
ctg tcg gtg att atg cca gag att gct gaa tgc tcg gac tcg gta gct			1296
Leu Ser Val Ile Met Pro Glu Ile Ala Glu Cys Ser Asp Ser Val Ala			
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His Val Ala Arg Arg Gly Leu Ile Tyr Arg Gly Ile Ile Pro Val Val			
435	440	445	
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Gly Cys Ser Ala Arg Asp Ser Thr Glu Glu Met Ile Arg Leu Ala Ile			
450	455	460	
gga ttt gcc aag acg aag gga att tgt aag act gga gat tcc att gtg			1440
Gly Phe Ala Lys Thr Lys Gly Ile Cys Lys Thr Gly Asp Ser Ile Val			
465	470	475	480
gct ttg cac aag att gat ggt tca tct att gtc agg ata gtg agc gtc			1488
Ala Leu His Lys Ile Asp Gly Ser Ser Ile Val Arg Ile Val Ser Val			
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Glu			

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Phe Ser His Gly Ser His Ser Tyr His Gln Glu Thr Leu Asp Asn Leu	
50 55 60	
Arg Thr Ala Met Asp Asn Thr Gly Ile Leu Cys Ala Val Met Leu Asp	
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Thr Lys Ser Pro Val Ile Arg Thr Gly Phe Leu Lys Glu Gly Lys Pro	
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BPS64825PC-2008028659

Ile Gln Leu Lys Gln Gly Gln Glu Ile Thr Ile Ser Ile Asp Tyr Lys
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Ile Gln Gly Asp Ser Asn Thr Ile Ser Met Ser Tyr Lys Lys Leu Ala
115 120 125

Glu Asp Leu Lys Pro Gly Asp Val Ile Leu Cys Ser Asp Gly Thr Ile
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Ser Leu Asn Val Leu Ser Cys Asp Lys Tyr Leu Gly Leu Val Arg Cys
145 150 155 160

Arg Cys Glu Asn Ser Ala Leu Leu Gly Glu Arg Lys Asn Val Asn Leu
165 170 175

Pro Gly Ile Val Val Asp Leu Pro Thr Leu Thr Glu Lys Asp Lys Glu
180 185 190

Asp Ile Met Gln Trp Gly Val Pro Asn Lys Ile Asp Ile Ile Ala Leu
195 200 205

Ser Phe Val Arg Lys Gly Ser Asp Leu Ile Gln Val Arg Lys Leu Leu
210 215 220

Gly Glu His Ser Lys Ser Ile Met Leu Met Ser Lys Val Glu Asn Gln
225 230 235 240

Glu Gly Val Met Asn Phe Asp Lys Ile Leu Glu Asn Ser Asp Ala Phe
245 250 255

Met Val Ala Arg Gly Asp Leu Gly Met Glu Ile Pro Ile Glu Lys Met
260 265 270

Phe Leu Ala Gln Lys Thr Met Ile Asn Lys Ala Asn Ala His Gly Lys
275 280 285

Pro Val Val Thr Ala Thr Gln Met Leu Glu Ser Met Thr Val Ser Pro
290 295 300

Arg Pro Thr Arg Ala Glu Ala Thr Asp Val Ala Asn Ala Val Leu Asp
305 310 315 320

Gly Thr Asp Cys Val Met Leu Ser Gly Glu Thr Ala Ala Gly Ala His
325 330 335

Pro Glu Thr Ala Val Leu Thr Met Ser Arg Ile Cys Lys Glu Ala Glu
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Asp Phe Ile Asp Tyr Asp Ile Leu His Lys Lys Thr Leu Gly Met Val
355 360 365

BPS64825PC-2008028659

Ser Leu Pro Leu Ser Pro Ile Glu Ser Leu Ala Ala Ser Ala Val Ser
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Thr Ala Arg Ser Val Phe Ala Ser Ala Ile Val Val Leu Thr Arg Gly
385 390 395 400

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405 410 415

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420 425 430

His Val Ala Arg Arg Gly Leu Ile Tyr Arg Gly Ile Ile Pro Val Val
435 440 445

Gly Cys Ser Ala Arg Asp Ser Thr Glu Glu Met Ile Arg Leu Ala Ile
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Glu

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gacattatct gaacaaagcg cttctccata acaaagggtga ttcaattagt cgat atg 177
Met
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gta gga ctt gat tca agc cac ttg ttg aga gac aag atc ctt tgc ttc 225
Val Gly Leu Asp Ser Ser His Leu Leu Arg Asp Lys Ile Leu Cys Phe
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Ser Ser Arg Ser His Ile Asn Asn Gln His Lys Lys Thr Ser Tyr Ala
20 25 30
tta tca ctt aat cac atg aaa ctt cct att cag aga acc tta gct ttt 321
Leu Ser Leu Asn His Met Lys Leu Pro Ile Gln Arg Thr Leu Ala Phe
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gcc tta gct cgc ggg aaa ggc gaa gct gaa agt ttc agc aga ttg gaa 369
Seite 13

BPS64825PC-2008028659

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ttt Phe	cca Pro	gat Asp	tct Ser 85	aaa Lys	gat Asp	gct Ala	atg Met 90	tct Ser	cat His	ctc Leu	aag Lys	tca Ser	gaa Glu 95	gca Ala	gac Asp	465
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ctg Leu	aat Asn 115	gct Ala	ctt Leu	cgg Arg	tca Ser	cat His 120	ctc Leu	tta Leu	gca Ala	gca Ala	gag Glu 125	aaa Lys	tgg Trp	aat Asn	gct Ala	561
tct Ser 130	caa Gln	cta Leu	cac His	tta Leu	tgt Cys 135	gac Asp	agt Ser	aag Lys	tat Tyr	ctg Leu 140	gaa Glu	tgt Cys	gca Ala	aca Thr	aac Asn 145	609
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agt Ser	cat His	cta Leu	gct Ala 165	tct Ser	ctt Leu	ggt Gly	ctg Leu	tca Ser 170	agt Ser	tta Leu	gac Asp	aac Asn 175	aac Asn	aat Asn	ctg Leu	705
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aaa Lys	gct Ala	gga Gly 260	aca Thr	tct Ser	gtt Val	atc Ile 265	cgt Arg 265	ata Ile	aac Asn	tgt Cys	gca Ala	cat His 270	gga Gly	gat Asp	cca Pro	993
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BPS64825PC-2008028659

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Glu	Ser	Phe	Val	Arg	Leu	Lys	Val	Gly	Asp	Leu	Leu	Val	Ile	Thr	Arg					
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Leu	Gly	Ile	Val	Leu	Lys	Ile	Glu	Thr	Lys	Ser	Gly	Phe	Lys	Asn	Leu					
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BPS64825PC-2008028659

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gtt cca act aga gct gag att act gat gct gca aat gca aaa agg gcg Val Pro Thr Arg Ala Glu Ile Thr Asp Ala Ala Asn Ala Lys Arg Ala 660 665 670	2193
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tct gaa aat ctc cat tga tctgcttgta gtttgcttgg ccatttatat Ser Glu Asn Leu His 710	2337
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Phe Ala Leu Ala Arg Gly Lys Gly Glu Ala Glu Ser Phe Ser Arg Leu 50 55 60
Glu Ala Thr Phe Gly Asp Asn Thr Ser Thr Glu Cys Thr Trp Ser Phe 65 70 75 80
Asp Phe Pro Asp Ser Lys Asp Ala Met Ser His Leu Lys Ser Glu Ala 85 90 95
Asp Leu Ser Gly Ser Asn Gly Ala Asn Asn Val Ala Ser Val Ile Glu 100 105 110

BPS64825PC-2008028659

Lys Leu Asn Ala Leu Arg Ser His Leu Leu Ala Ala Glu Lys Trp Asn
 115 120 125
 Ala Ser Gln Leu His Leu Cys Asp Ser Lys Tyr Leu Glu Cys Ala Thr
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 Asn Ser His Leu Ala Ser Leu Gly Leu Ser Ser Leu Asp Asn Asn Asn
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 Asp Gln Asn Ala Val Thr Glu Ser Trp Thr Asn Val Tyr Pro Lys Gly
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 Lys Ser Thr Lys Lys Asn Asp Lys Gly Arg Val Leu Ser Tyr Lys Glu
 210 215 220
 Ser Leu Leu Gly Lys Leu Arg Glu Gly Arg Ser Thr His Ile Met Val
 225 230 235 240
 Thr Ile Gly Glu Glu Ala Thr Leu Ser Glu Thr Phe Ile Thr Asp Ile
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 Leu Lys Ala Gly Thr Ser Val Ile Arg Ile Asn Cys Ala His Gly Asp
 260 265 270
 Pro Ser Ile Trp Gly Glu Ile Ile Lys Arg Val Arg Arg Thr Ser Gln
 275 280 285
 Met Leu Glu Met Pro Cys Arg Val His Met Asp Leu Ala Gly Pro Lys
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 Pro Lys Lys Asp Ala Tyr Gly Asn Val Val Ser Pro Ala Leu Val Trp
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 Asp Ser Ile Arg Leu Cys Asp Ala Arg Gly Arg Lys Arg Arg Leu Lys
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BPS64825PC-2008028659

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

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625 630 635 640

Val Pro Val Ile Met Ala Thr Gln Val Leu Glu Ser Leu Val Lys Ser
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BPS64825PC-2008028659

Gly Val Pro Thr Arg Ala Glu Ile Thr Asp Ala Ala Asn Ala Lys Arg
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Ala Ser Cys Val Met Leu Asn Lys Gly Lys Asn Ile Val Glu Ala Val
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Ser Met Leu Asp Thr Ile Leu His Thr Lys Leu Ile Tyr Lys Lys Ser
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Asp Ser Glu Asn Leu His
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ccgtttatcg aacatctgag atctctctcc acttccgtca ccgaag atg cat tcc 175
Met His Ser
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agt cat ctt ctt ctc gag gag ccg atc agg atg gct tca atc ctc gag 223
Ser His Leu Leu Leu Glu Glu Pro Ile Arg Met Ala Ser Ile Leu Glu
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cct tcc aaa tct agt ttc ttc ccg gca ttg act aag atc gtc gga act 271
Pro Ser Lys Ser Ser Phe Phe Pro Ala Leu Thr Lys Ile Val Gly Thr
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cta ggt cct aaa tcc cga tcc gtc gag gct ctc tcc ggc tgt ctc aaa 319
Leu Gly Pro Lys Ser Arg Ser Val Glu Ala Leu Ser Gly Cys Leu Lys
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gcc ggc atg tct gtg gct cga ttt gat ttc tcg tgg gga gat gct gat 367
Ala Gly Met Ser Val Ala Arg Phe Asp Phe Ser Trp Gly Asp Ala Asp
55 60 65
tat cac cag gag aca ctt gat aat ttg aaa gtt gct gtg agg agc act 415
Tyr His Gln Glu Thr Leu Asp Asn Leu Lys Val Ala Val Arg Ser Thr
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aag aag ctt tgt gct gtt atg ctt gat act gtt gga cct gag cta caa 463
Lys Lys Leu Cys Ala Val Met Leu Asp Thr Val Gly Pro Glu Leu Gln
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gtt att aac aaa tct gag aaa gct att act ttg aaa gct gat ggc ctt 511
Val Ile Asn Lys Ser Glu Lys Ala Ile Thr Leu Lys Ala Asp Gly Leu
100 105 110 115
gta act ttg aca ccg aat caa gat caa gaa gct tct tct gaa gtt ctt 559
Val Thr Leu Thr Pro Asn Gln Asp Gln Glu Ala Ser Ser Glu Val Leu
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ccc att aat ttc aat gga ctt gcc aag gca gtg aag aaa gga gac acc 607
Seite 19

BPS64825PC-2008028659

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tgg Trp	ctc Leu 165	gag Glu	ggt Val	gat Asp	gaa Glu 170	ggt Val 170	aaa Lys	gga Gly	gat Asp	gat Asp	gtc Val 175	att Ile	tgc Cys	ctt Leu	tca Ser	703
agg Arg 180	aat Asn	gct Ala	gct Ala	act Thr	ctg Leu 185	gct Ala	ggg Gly	tct Ser	ttg Leu	ttc Phe 190	act Thr	tta Leu	cac His	tcc Ser	tct Ser 195	751
caa Gln	ggt Val	cac His	att Ile	gat Asp 200	ctc Leu	cca Pro	acg Thr	ctt Leu	aca Thr 205	gag Glu	aag Lys	gat Asp	aag Lys	gag Glu 210	ggt Val	799
ata Ile	agc Ser	aca Thr	tgg Trp 215	gga Gly	ggt Val	caa Gln	aat Asn	aaa Lys 220	atc Ile	gat Asp	ttt Phe	ctc Leu	tca Ser 225	ttg Leu	tct Ser	847
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aag Lys 245	ttg Leu	ggc Gly	gac Asp	ctc Leu	tct Ser	caa Gln 250	aca Thr	caa Gln	ata Ile	ttt Phe	gct Ala 255	aag Lys	att Ile	gag Glu	aac Asn	943
gta Val 260	gag Glu	gga Gly	cta Leu	acc Thr	cac His 265	ttc Phe	gat Asp	gag Glu	att Ile	cta Leu 270	caa Gln	gaa Glu	gct Ala	gat Asp	ggc Gly 275	991
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gtg Val	ttt Phe	ttg Leu	ttt Phe 295	caa Gln	aag Lys	gct Ala	gct Ala	ctt Leu 300	tac Tyr	aag Lys	tgc Cys	aac Asn	atg Met 305	gct Ala	gga Gly	1087
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cga Arg	cca Pro 325	act Thr	cgt Arg	gct Ala	gag Glu	gcc Ala 330	acg Thr	gat Asp	ggt Val	gct Ala	aat Asn 335	gct Ala	ggt Val	tta Leu	gat Asp	1183
gga Gly 340	agt Ser	gat Asp	gca Ala	att Ile	ctt Leu 345	ctt Leu	ggg Gly	gct Ala	gag Glu	acc Thr 350	ctt Leu	cgt Arg	gga Gly	ttg Leu	tac Tyr 355	1231
cct Pro	ggt Val	gag Glu	aca Thr	ata Ile 360	tca Ser	act Thr	ggt Val	ggt Gly	agg Arg 365	atc Ile	tgt Cys	gct Ala	gag Glu	gca Ala 370	gaa Glu	1279
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gga Gly	gaa Glu	cca Pro 390	atg Met	act Thr	cac His	ttg Leu	gaa Glu 395	tcg Ser	att Ile	gct Ala	tct Ser	tca Ser 400	gct Ala	gta Val	cgg Arg	1375
gca Ala	gcc Ala	att Ile	aag Lys	ggt Val	aag Lys	gca Ala	tcc Ser	gta Val	att Ile	ata Ile	tgc Cys	ttc Phe	acc Thr	tct Ser	tct Ser	1423

BPS64825PC-2008028659

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 Gly Arg Ala Ala Arg Leu Ile Ala Lys Tyr Arg Pro Thr Met Pro Val
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 Ile Ser Val Val Ile Pro Arg Val Lys Thr Asn Gln Leu Lys Trp Ser
 440 445 450

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 Phe Ser Gly Ala Phe Glu Ala Arg Gln Ser Leu Ile Val Arg Gly Leu
 455 460 465

ttc cct atg ctt gct gac cct cgt cac cct gcg gaa tct aca agt gcg 1615
 Phe Pro Met Leu Ala Asp Pro Arg His Pro Ala Glu Ser Thr Ser Ala
 470 475 480

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 Thr Asn Glu Ser Val Leu Lys Val Ala Leu Asp His Gly Lys His Ala
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 Gly Val Ile Lys Ser His Asp Arg Val Val Val Cys Gln Lys Val Gly
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gat gca tct gtg gtt aag atc att gag ctt gag gat taa cttttgcctc 1760
 Asp Ala Ser Val Val Lys Ile Ile Glu Leu Glu Asp
 520 525

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Cys Leu Lys Ala Gly Met Ser Val Ala Arg Phe Asp Phe Ser Trp Gly
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Asp Ala Asp Tyr His Gln Glu Thr Leu Asp Asn Leu Lys Val Ala Val
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Arg Ser Thr Lys Lys Leu Cys Ala Val Met Leu Asp Thr Val Gly Pro
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BPS64825PC-2008028659

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 Asp Gly Leu Val Thr Leu Thr Pro Asn Gln Asp Gln Glu Ala Ser Ser
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 Gly Asp Thr Ile Phe Val Gly Gln Tyr Leu Phe Thr Gly Ser Glu Thr
 145 150 155 160
 Thr Ser Val Trp Leu Glu Val Asp Glu Val Lys Gly Asp Asp Val Ile
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 Cys Leu Ser Arg Asn Ala Ala Thr Leu Ala Gly Ser Leu Phe Thr Leu
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 His Ser Ser Gln Val His Ile Asp Leu Pro Thr Leu Thr Glu Lys Asp
 195 200 205
 Lys Glu Val Ile Ser Thr Trp Gly Val Gln Asn Lys Ile Asp Phe Leu
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 Ser Leu Ser Tyr Cys Arg His Ala Glu Asp Val Arg Gln Thr Arg Glu
 225 230 235 240
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 245 250 255
 Ile Glu Asn Val Glu Gly Leu Thr His Phe Asp Glu Ile Leu Gln Glu
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 Ala Asp Gly Ile Ile Leu Ser Arg Gly Asn Leu Gly Ile Asp Leu Pro
 275 280 285
 Pro Glu Lys Val Phe Leu Phe Gln Lys Ala Ala Leu Tyr Lys Cys Asn
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 Asp Asn Leu Arg Pro Thr Arg Ala Glu Ala Thr Asp Val Ala Asn Ala
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 Gly Leu Tyr Pro Val Glu Thr Ile Ser Thr Val Gly Arg Ile Cys Ala
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Arg Gly Leu Phe Pro Met Leu Ala Asp Pro Arg His Pro Ala Glu Ser
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Thr Ser Ala Thr Asn Glu Ser Val Leu Lys Val Ala Leu Asp His Gly
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 Lys Thr Lys Ile Ile Cys Thr Leu Gly Pro Val Ser Arg Ser Val Glu
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 Met Ile Glu Lys Leu Leu Lys Ala Gly Met Asn Val Ala Arg Phe Asn
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ttc tct cat ggt tct cac tct tac cat caa gaa act ctc gat aat ctc 192
 Phe Ser His Gly Ser His Ser Tyr His Gln Glu Thr Leu Asp Asn Leu
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cga acc gcc atg gac aac act ggt att ctc tcc gcc gtc atg ctc gac 240
 Seite 23

BPS64825PC-2008028659

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ata Ile	cag Gln	cta Leu	aac Asn 100	caa Gln	ggt Gly	caa Gln	gag Glu	atc Ile 105	acc Thr	atc Ile	tca Ser	att Ile	gat Asp 110	tac Tyr	atg Met	336
ata Ile	gaa Glu	gga Gly 115	gat Asp	tca Ser	aac Asn	gtt Val	atc Ile 120	tcc Ser	atg Met	agc Ser	tac Tyr	aag Lys 125	aaa Lys	ctt Leu	gca Ala	384
gaa Glu	gac Asp 130	gtc Val	aaa Lys	cct Pro	ggt Gly	gat Asp 135	gtg Val	att Ile	ctc Leu	tgt Cys	tca Ser 140	gac Asp	ggc Gly	aca Thr	atc Ile	432
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gga Gly 225	gaa Glu	cac His	tca Ser	aag Lys	aac Asn 230	atc Ile	atg Met	ctc Leu	atg Met	tca Ser 235	aag Lys	gtg Val	gag Glu	aat Asn	caa Gln 240	720
gaa Glu	ggg Gly	gtc Val	atg Met	aat Asn 245	tgt Cys	gaa Glu	aag Lys	att Ile 250	ctg Leu 250	gag Glu	aat Asn	tct Ser	gat Asp	gct Ala 255	ttc Phe	768
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cgt Arg 305	ccg Pro	act Thr	aga Arg	gct Ala	gaa Glu 310	gcc Ala	act Thr	gac Asp	gtt Val	gca Ala 315	aac Asn	gct Ala	gtt Val	ctt Leu	gac Asp 320	960
ggg Gly	aca Thr	gac Asp	tgc Cys	gtt Val 325	atg Met	ctt Leu	agt Ser	gga Gly 330	gaa Glu 330	acc Thr	gct Ala	gct Ala	gga Gly 335	gct Ala 335	cac His	1008
cct Pro	gag Glu	gct Ala	gcc Ala	gtg Val	cta Leu	aca Thr	atg Met	tca Ser	agg Arg	atc Ile	tgt Cys	aaa Lys	gaa Glu	gca Ala	gag Glu	1056

BPS64825PC-2008028659

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Leu	Ser	Val	Ile	Val	Pro	Glu	Ile	Ala	Gln	Gly	Asn	Asp	Met	Glu	Met										
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		435					440					445													
cgt	agg	att	att	ccg	gtg	gtg	gcg	acg	gga	tct	tcg	gct	agg	gat	tca	1392									
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Asn	Lys	Asp	Ala	Thr	Glu	Glu	Met	Ile	Asn	Leu	Ala	Ile	Gly	Phe	Ala										
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Arg Thr Ala Met Asp Asn Thr Gly Ile Leu Ser Ala Val Met Leu Asp
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Ser Phe Val Arg Lys Gly Ser Asp Leu Thr Glu Val Arg Arg Leu Leu
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Gly Glu His Ser Lys Asn Ile Met Leu Met Ser Lys Val Glu Asn Gln
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Glu Gly Val Met Asn Cys Glu Lys Ile Leu Glu Asn Ser Asp Ala Phe
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Met Val Ala Arg Gly Asp Leu Gly Met Glu Ile Pro Ile Glu Lys Met
260 265 270

Phe Leu Ala Gln Lys Thr Met Ile Lys Met Ala Asn Ala Leu Gly Lys
275 280 285

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Arg Pro Thr Arg Ala Glu Ala Thr Asp Val Ala Asn Ala Val Leu Asp
305 310 315 320

Gly Thr Asp Cys Val Met Leu Ser Gly Glu Thr Ala Ala Gly Ala His
325 330 335

Pro Glu Ala Ala Val Leu Thr Met Ser Arg Ile Cys Lys Glu Ala Glu
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BPS64825PC-2008028659

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Ser Leu Pro Leu Ser Pro Ile Glu Ser Leu Ala Ala Ser Val Val Ser
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 385 390 395 400

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

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 Ala Met Asn Asn Thr Gly Ile Leu Cys Ala Val Met Leu Asp Thr Lys 50 55 60

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BPS64825PC-2008028659

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gga Gly	gat Asp	tca Ser	aac Asn	att Ile	atc Ile	tcc Ser	atg Met	agc Ser	tac Tyr	aag Lys	aaa Lys	ctt Leu	gca Ala	gag Glu	gac Asp	336
gtc Val	aaa Lys	cct Pro	ggg Gly	gat Asp	gtg Val	att Ile	ctc Leu	tgt Cys	tca Ser	gac Asp	ggc Gly	aca Thr	atc Ile	tct Ser	tta Leu	384
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gtt Val	cgt Arg	aaa Lys	gga Gly	tct Ser	gac Asp	cta Leu	act Thr	gaa Glu	gtt Val	agg Arg	aag Lys	tta Leu	ctt Leu	gga Gly	gaa Glu	624
cac His	tca Ser	aag Lys	aac Asn	atc Ile	atg Met	ctc Leu	atg Met	tca Ser	aag Lys	gtg Val	gag Glu	aat Asn	caa Gln	gaa Glu	ggg Gly	672
gtc Val	atg Met	aat Asn	tgt Cys	gaa Glu	aag Lys	att Ile	ctg Leu	gag Glu	aat Asn	tct Ser	gat Asp	gct Ala	ttc Phe	atg Met	gtg Val	720
gct Ala	aga Arg	gga Gly	gat Asp	ctt Leu	gga Gly	atg Met	gag Glu	att Ile	cag Gln	atc Ile	gaa Glu	aag Lys	atg Met	ttc Phe	ctt Leu	768
gct Ala	cag Gln	aaa Lys	aca Thr	atg Met	atc Ile	aag Lys	atg Met	gct Ala	aat Asn	gct Ala	ctt Leu	ggg Gly	aaa Lys	cca Pro	gtt Val	816
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atc Ile	gat Asp	tac Tyr	gac Asp	att Ile	ctc Leu	cac His	aag Lys	aaa Lys	acc Thr	cta Leu	gga Gly	atg Met	ctt Leu	tcg Ser	tta Leu	1056

BPS64825PC-2008028659

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Ser	Asp	Ser	Val	Ala	His	Val	Ala	Arg	Arg	Gly	Leu	Ile	Tyr	Arg	Gly										
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Ile	Ile	Pro	Val	Val	Ala	Thr	Gly	Ser	Ser	Ala	Arg	Asp	Ser	Asn	Lys										
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gat	gca	acg	gag	gag	atg	att	aat	ttg	gct	atc	gga	ttc	gcg	aag	acg	1392									
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BPS64825PC-2008028659

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 Val Lys Pro Gly Asp Val Ile Leu Cys Ser Asp Gly Thr Ile Ser Leu
 115 120 125
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 Glu Asn Ser Thr Ile Leu Gly Glu Arg Lys Asn Val Asn Leu Pro Gly
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 Ile Val Val Asp Leu Pro Thr Leu Thr Glu Lys Asp Lys Glu Asp Ile
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 Val Arg Lys Gly Ser Asp Leu Thr Glu Val Arg Lys Leu Leu Gly Glu
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 His Ser Lys Asn Ile Met Leu Met Ser Lys Val Glu Asn Gln Glu Gly
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 Val Met Asn Cys Glu Lys Ile Leu Glu Asn Ser Asp Ala Phe Met Val
 225 230 235 240
 Ala Arg Gly Asp Leu Gly Met Glu Ile Gln Ile Glu Lys Met Phe Leu
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 Ala Gln Lys Thr Met Ile Lys Met Ala Asn Ala Leu Gly Lys Pro Val
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 Val Thr Ala Thr Gln Met Leu Glu Ser Met Thr Val Ser Pro Arg Pro
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 Thr Arg Ala Glu Ala Thr Asp Val Ala Asn Ala Val Leu Asp Gly Thr
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 Asp Cys Val Met Leu Ser Gly Glu Thr Ala Ala Gly Ala His Pro Glu
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 Ala Ala Val Leu Thr Met Ser Arg Ile Cys Lys Glu Ala Glu Asp Phe
 325 330 335
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 Pro Leu Ser Pro Ile Glu Ser Leu Ala Ala Ser Val Val Ser Thr Ala
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Gln Ser Val Phe Ala Ser Ala Ile Val Val Leu Thr Lys Gly Gly Tyr
 370 375 380

Thr Ala Glu Leu Val Ala Lys Tyr Arg Pro Ser Val Pro Ile Leu Ser
 385 390 395 400

Val Ile Val Pro Glu Ile Ala Gln Gly Asn Asp Ile Glu Met Ser Cys
 405 410 415

Ser Asp Ser Val Ala His Val Ala Arg Arg Gly Leu Ile Tyr Arg Gly
 420 425 430

Ile Ile Pro Val Val Ala Thr Gly Ser Ser Ala Arg Asp Ser Asn Lys
 435 440 445

Asp Ala Thr Glu Glu Met Ile Asn Leu Ala Ile Gly Phe Ala Lys Thr
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 Gly Pro Ala Ser Arg Ser Val Pro Met Val Glu Lys Leu Leu Met Ala
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 ggg atg agc gtg gct cgc ttc aac ttt tct cat gga tct tac gaa tat 145
 Gly Met Ser Val Ala Arg Phe Asn Phe Ser His Gly Ser Tyr Glu Tyr
 35 40 45
 cac cag gag act ctc gac aat ctt cgt cag gcc atg ctt aac act ggc 193
 His Gln Glu Thr Leu Asp Asn Leu Arg Gln Ala Met Leu Asn Thr Gly
 50 55 60
 atg cta tgt gct gtc atg ctc gac acc aag gga cca gag att cga acc 241
 Met Leu Cys Ala Val Met Leu Asp Thr Lys Gly Pro Glu Ile Arg Thr
 65 70 75
 ggg ttc tta aag gat ggg aaa cct atc cag ctc aaa caa ggc caa gaa 289
 Gly Phe Leu Lys Asp Gly Lys Pro Ile Gln Leu Lys Gln Gly Gln Glu
 80 85 90 95
 atc acc att tca act gac tat gac ttg aag ggt gat gag aaa act att 337
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BPS64825PC-2008028659

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Phe	Lys	Arg	Ile 355	Met	Leu	His	Ala	Ala 360	Val	Pro	Met	Ser	Pro 365	Met	Glu		
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BPS64825PC-2008028659

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375

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BPS64825PC-2008028659

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 Ser His Glu Tyr His Gln Glu Thr Leu Asp Asn Leu Arg Ser Ala Met
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gct Ala	gaa Glu	gcc Ala 315	aca Thr	gat Asp	gtt Val	gca Ala	aat Asn 320	gct Ala	gtt Val	ctt Leu	gat Asp	ggg Gly 325	act Thr	gac Asp	tgt Cys	1072
gtg Val	atg Met 330	ctt Leu	agc Ser	ggg Gly	gag Glu	agt Ser 335	gca Ala	gca Ala	gga Gly	gct Ala	tat Tyr 340	ccg Pro	gaa Glu	ata Ile	gct Ala	1120
gtg Val 345	aaa Lys	gtc Val	atg Met	gct Ala	aag Lys 350	atc Ile	tgc Cys	att Ile	gaa Glu	gcc Ala 355	gaa Glu	tcc Ser	tcg Ser	ctt Leu	gat Asp 360	1168

BPS64825PC-2008028659

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Asn	Leu	Val	Ala	Lys	Tyr	Arg	Pro	Ala	Val	Pro	Ile	Leu	Ser	Val	Val									
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Ser	Pro	Ala	Arg	His	Ser	Leu	Ile	Tyr	Arg	Gly	Leu	Ile	Pro	Met	Leu									
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gct	gaa	gga	tct	gca	aag	gca	aca	gat	agt	gaa	gcc	acc	gaa	gtt	atc	1504								
Ala	Glu	Gly	Ser	Ala	Lys	Ala	Thr	Asp	Ser	Glu	Ala	Thr	Glu	Val	Ile									
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att	gaa	gct	gct	ctg	aag	tcg	gct	act	cag	aga	gga	ctg	tgc	aac	cgt	1552								
Ile	Glu	Ala	Ala	Leu	Lys	Ser	Ala	Thr	Gln	Arg	Gly	Leu	Cys	Asn	Arg									
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ggg	gat	gca	atc	gtg	gca	ctg	cac	cgt	att	gga	gct	gcc	tca	gtt	att	1600								
Gly	Asp	Ala	Ile	Val	Ala	Leu	His	Arg	Ile	Gly	Ala	Ala	Ser	Val	Ile									
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Lys	Ile	Cys	Val	Val	Lys																			
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Arg	Thr	Val	Ser	Met	Ile	Glu	Lys	Leu	Leu	Lys	Ala	Gly	Met	Asn	Val	
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BPS64825PC-2008028659

Leu Asp Asn Leu Arg Ser Ala Met His Asn Thr Gly Ile Leu Ala Ala
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 Val Met Leu Asp Thr Lys Gly Pro Glu Ile Arg Thr Gly Phe Leu Lys
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 100 105 110
 Thr Asp Tyr Asp Ile Gln Gly Asp Glu Ser Thr Ile Ser Met Ser Tyr
 115 120 125
 Lys Lys Leu Pro Leu Asp Val Lys Pro Gly Asn Thr Ile Leu Cys Ala
 130 135 140
 Asp Gly Ser Ile Ser Leu Ala Val Leu Ser Cys Asp Pro Glu Ser Gly
 145 150 155 160
 Thr Val Arg Cys Arg Cys Glu Asn Ser Ala Met Leu Gly Glu Arg Lys
 165 170 175
 Asn Val Asn Leu Pro Gly Val Val Val Asp Leu Pro Thr Leu Thr Asp
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 Lys Asp Ile Glu Asp Ile Leu Gly Trp Gly Val Pro Asn Ser Ile Asp
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 Met Ile Ala Leu Ser Phe Val Arg Lys Gly Ser Asp Leu Val Asn Val
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 Arg Lys Val Leu Gly Ser His Ala Lys Ser Ile Met Leu Met Ser Lys
 225 230 235 240
 Val Glu Asn Gln Glu Gly Val Ile Asn Phe Asp Glu Ile Leu Arg Glu
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 Thr Asp Ala Phe Met Val Ala Arg Gly Asp Leu Gly Met Glu Ile Pro
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 Ile Glu Lys Ile Phe Leu Ala Gln Lys Leu Met Ile Tyr Lys Cys Asn
 275 280 285
 Leu Ala Gly Lys Pro Val Val Thr Ala Thr Gln Met Leu Glu Ser Met
 290 295 300
 Ile Lys Ser Pro Arg Pro Thr Arg Ala Glu Ala Thr Asp Val Ala Asn
 305 310 315 320
 Ala Val Leu Asp Gly Thr Asp Cys Val Met Leu Ser Gly Glu Ser Ala
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BPS64825PC-2008028659

Ala Gly Ala Tyr Pro Glu Ile Ala Val Lys Val Met Ala Lys Ile Cys
340 345 350

Ile Glu Ala Glu Ser Ser Leu Asp Tyr Asn Thr Ile Phe Lys Glu Met
355 360 365

Ile Arg Ala Thr Pro Leu Pro Met Ser Pro Leu Glu Ser Leu Ala Ser
370 375 380

Ser Ala Val Arg Thr Ala Asn Lys Ala Arg Ala Lys Leu Ile Ile Val
385 390 395 400

Leu Thr Arg Gly Gly Ser Thr Ala Asn Leu Val Ala Lys Tyr Arg Pro
405 410 415

Ala Val Pro Ile Leu Ser Val Val Val Pro Val Met Thr Thr Asp Ser
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Phe Asp Trp Ser Cys Ser Asp Glu Ser Pro Ala Arg His Ser Leu Ile
435 440 445

Tyr Arg Gly Leu Ile Pro Met Leu Ala Glu Gly Ser Ala Lys Ala Thr
450 455 460

Asp Ser Glu Ala Thr Glu Val Ile Ile Glu Ala Ala Leu Lys Ser Ala
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ttagcg atg gcg atg ata gag caa agg ccg aag acg aag atc gtt tgt 168
Met Ala Met Ile Glu Gln Arg Pro Lys Thr Lys Ile Val Cys
1 5 10
act cta ggt cca gct tcc aga tct gtt ccg atg gtc gag aag ctt ctt 216
Thr Leu Gly Pro Ala Ser Arg Ser Val Pro Met Val Glu Lys Leu Leu
15 20 25 30
agg gct ggt atg aac gtt gct cgt ttc aat ttc tct cat gga tct cat 264
Seite 39

BPS64825PC-2008028659

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cga Arg	acc Thr 80	ggg Gly	ttc Phe	ttg Leu	aaa Lys	gat Asp 85	ggg Gly	aaa Lys	cca Pro	atc Ile	cag Gln 90	ctg Leu	aaa Lys	caa Gln	gga Gly	408	
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atg Met	gtc Val	att Ile 130	ctt Leu	tgt Cys	gct Ala	gat Asp	ggg Gly 135	aca Thr	atc Ile	tcc Ser	tta Leu	ctg Leu 140	gtt Val	ctc Leu	tct Ser	552	
tgt Cys	gac Asp	aaa Lys 145	gag Glu	aac Asn	ggg Gly	aca Thr 150	gtc Val 155	cgt Arg	tgc Cys	cgg Arg	tgt Cys	gag Glu 155	aac Asn	tct Ser	gcg Ala	600	
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ctc Leu 175	cca Pro	act Thr	cta Leu	act Thr	gag Glu 180	aaa Lys	gac Asp	aaa Lys	gaa Glu	gac Asp 185	atc Ile	atg Met	caa Gln	tgg Trp	gga Gly 190	696	
gtc Val	ccg Pro	aat Asn	caa Gln 195	atc Ile	gac Asp	atg Met	att Ile	gct Ala 200	ctg Leu	tct Ser	ttt Phe	gtc Val	agg Arg	aaa Lys 205	ggg Gly	744	
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gat Asp 240	gac Asp	att Ile	ttg Leu	gtc Val	aac Asn	tca Ser 245	gac Asp	gct Ala	ttc Phe	atg Met	att Ile 250	gct Ala	aga Arg	gga Gly	gat Asp	888	
ctg Leu 255	ggc Gly	atg Met	gaa Glu	atc Ile	ccg Pro 260	att Ile	gag Glu	aag Lys	atc Ile	ttc Phe 265	tta Leu	gct Ala	cag Gln	aag Lys	gtg Val 270	936	
atg Met	atc Ile	tac Tyr	aaa Lys	tgc Cys 275	aac Asn	atc Ile	cag Gln	gga Gly 280	aaa Lys	cct Pro	gtg Val	gtc Val	aca Thr	gca Ala 285	act Thr	984	
cag Gln	atg Met	ctc Leu	gag Glu 290	tcc Ser	atg Met	atc Ile	aaa Lys	tct Ser 295	cct Pro	aga Arg	ccc Pro	aca Thr	aga Arg 300	gcc Ala	gaa Glu	1032	
gct Ala	acg Thr	gat Asp	gta Val	gca Ala	aac Asn	gca Ala	gtc Val	ctt Leu	gat Asp	ggg Gly	aca Thr	gac Asp	tgt Cys	gtc Val	atg Met	1080	

BPS64825PC-2008028659

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gat gtc ttc aag agg atc atg ctg tac tct cca gtt cca atg agt cca Asp Val Phe Lys Arg Ile Met Leu Tyr Ser Pro Val Pro Met Ser Pro 355 360 365			1224
ctc gag tca ctt gca tct tca gct gtc aga act gct aac tca gct aga Leu Glu Ser Leu Ala Ser Ser Ala Val Arg Thr Ala Asn Ser Ala Arg 370 375 380			1272
gcc act ctc atc atg gtc cta acc aga gga gga agc aca gca aga ctt Ala Thr Leu Ile Met Val Leu Thr Arg Gly Gly Ser Thr Ala Arg Leu 385 390 395			1320
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gag atc aaa acc gac ttc ttt gac tgg tct tgc agc gat gaa tcc ccc Glu Ile Lys Thr Asp Phe Phe Asp Trp Ser Cys Ser Asp Glu Ser Pro 415 420 425 430			1416
gcg aga cac agc ctt atc ttc cgt ggt ctg atc cca gtg ctc tac gct Ala Arg His Ser Leu Ile Phe Arg Gly Leu Ile Pro Val Leu Tyr Ala 435 440 445			1464
gga tcc gca aga gcc tca cac gat gaa tca aca gaa gaa gct atc gag Gly Ser Ala Arg Ala Ser His Asp Glu Ser Thr Glu Glu Ala Ile Glu 450 455 460			1512
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aaaactcaag ttctatTTTT tgcttattac cacaactact gtgaccggtg aatccactta			1783
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BPS64825PC-2008028659

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Gly Met Asn Val Ala Arg Phe Asn Phe Ser His Gly Ser His Glu Tyr
35 40 45

His Gln Glu Thr Leu Asp Asn Leu His Gln Ala Met Leu Asn Thr Gly
50 55 60

Ile Leu Cys Ala Val Met Leu Asp Thr Lys Gly Pro Glu Ile Arg Thr
65 70 75 80

Gly Phe Leu Lys Asp Gly Lys Pro Ile Gln Leu Lys Gln Gly Gln Glu
85 90 95

Ile Thr Ile Ser Thr Asp Tyr Asp Leu Lys Gly Asp Glu Asn Thr Ile
100 105 110

Cys Met Ser Tyr Lys Lys Leu Ala Val Asp Val Asn Pro Gly Met Val
115 120 125

Ile Leu Cys Ala Asp Gly Thr Ile Ser Leu Leu Val Leu Ser Cys Asp
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Lys Glu Asn Gly Thr Val Arg Cys Arg Cys Glu Asn Ser Ala Met Leu
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Gly Glu Arg Lys Asn Val Asn Leu Pro Gly Val Val Val Asp Leu Pro
165 170 175

Thr Leu Thr Glu Lys Asp Lys Glu Asp Ile Met Gln Trp Gly Val Pro
180 185 190

Asn Gln Ile Asp Met Ile Ala Leu Ser Phe Val Arg Lys Gly Ser Asp
195 200 205

Leu Val Gln Val Arg Lys Leu Leu Gly Lys His Ala Lys Asn Ile Leu
210 215 220

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

Ile Leu Val Asn Ser Asp Ala Phe Met Ile Ala Arg Gly Asp Leu Gly
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Met Glu Ile Pro Ile Glu Lys Ile Phe Leu Ala Gln Lys Val Met Ile
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Tyr Lys Cys Asn Ile Gln Gly Lys Pro Val Val Thr Ala Thr Gln Met
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Leu Glu Ser Met Ile Lys Ser Pro Arg Pro Thr Arg Ala Glu Ala Thr
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Asp Val Ala Asn Ala Val Leu Asp Gly Thr Asp Cys Val Met Leu Ser
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Ala Lys Ile Cys Val Glu Ala Glu Ser Thr Leu Asp Tyr Gly Asp Val
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Phe Lys Arg Ile Met Leu Tyr Ser Pro Val Pro Met Ser Pro Leu Glu
355 360 365

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

Lys Tyr Arg Pro Gly Met Pro Ile Leu Ser Val Val Val Pro Glu Ile
405 410 415

Lys Thr Asp Phe Phe Asp Trp Ser Cys Ser Asp Glu Ser Pro Ala Arg
420 425 430

His Ser Leu Ile Phe Arg Gly Leu Ile Pro Val Leu Tyr Ala Gly Ser
435 440 445

Ala Arg Ala Ser His Asp Glu Ser Thr Glu Glu Ala Ile Glu Phe Ala
450 455 460

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Val Lys

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tct agg tct gtg aca atg att gag aag ctt ctt aaa gca ggc atg aat Ser Arg Ser Val Thr Met Ile Glu Lys Leu Leu Lys Ala Gly Met Asn 35 40 45	266
gta gct cga ttc aat ttc tct cac gga agc cat gag tac cat cag gag Val Ala Arg Phe Asn Phe Ser His Gly Ser His Glu Tyr His Gln Glu 50 55 60	314
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aaa gat ggg aac cct ata caa cta aag gaa ggc caa gag atc aca att Lys Asp Gly Asn Pro Ile Gln Leu Lys Glu Gly Gln Glu Ile Thr Ile 100 105 110	458
acc act gat tat gac atc aag ggc gat gag aaa acg att tcc atg agc Thr Thr Asp Tyr Asp Ile Lys Gly Asp Glu Lys Thr Ile Ser Met Ser 115 120 125	506
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gac aag gat gta gaa gat att ctt aaa tgg ggt gtt cca aac aac atc Asp Lys Asp Val Glu Asp Ile Leu Lys Trp Gly Val Pro Asn Asn Ile 195 200 205	746
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BPS64825PC-2008028659

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 35 40 45

Ala Arg Phe Asn Phe Ser His Gly Ser His Glu Tyr His Gln Glu Thr
 50 55 60

Leu Asp Asn Leu Arg Thr Ala Met Gln Asn Thr Gly Ile Leu Ala Ala
 65 70 75 80

Val Met Leu Asp Thr Lys Gly Pro Glu Ile Arg Thr Gly Phe Leu Lys
 85 90 95

Asp Gly Asn Pro Ile Gln Leu Lys Glu Gly Gln Glu Ile Thr Ile Thr
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Thr Asp Tyr Asp Ile Lys Gly Asp Glu Lys Thr Ile Ser Met Ser Tyr
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Lys Lys Leu Pro Val Asp Val Lys Pro Gly Asn Thr Ile Leu Cys Ala
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Asp Gly Ser Ile Ser Leu Ala Val Val Ser Cys Asp Pro Asn Ala Gly
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Thr Val Ile Cys Arg Cys Glu Asn Thr Ala Met Leu Gly Glu Arg Lys
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Asn Val Asn Leu Pro Gly Val Val Val Asp Leu Pro Thr Leu Thr Asp
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Lys Asp Val Glu Asp Ile Leu Lys Trp Gly Val Pro Asn Asn Ile Asp
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Met Ile Ala Leu Ser Phe Val Arg Lys Gly Ser Asp Leu Val Asn Val
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Arg Lys Val Leu Gly Ser His Ser Lys Ser Ile Met Leu Met Ser Lys
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BPS64825PC-2008028659

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Arg Thr Leu Ile Gly Ala Gly Val Arg Ser Thr Ser Ile Ser Leu Arg
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Ser Arg Glu Met Ile Trp Lys Leu Ala Glu Ala Gly Met Asn Val Ala
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Arg Leu Asn Met Ser His Gly Asp His Ala Ser His Gln Ile Thr Ile
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145                              150          155          160

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Ile Met Leu Asp Thr Lys Gly Pro Glu Val Arg Ser Gly Asp Val Pro
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Gln Pro Ile Phe Leu Glu Glu Gly Gln Glu Phe Asn Phe Thr Ile Lys
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Arg Gly Val Ser Leu Lys Asp Thr Val Ser Val Asn Tyr Asp Asp Phe
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BPS64825PC-2008028659

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ctt gtc caa agt ggc tcg caa ccc att tgg cgt gaa gaa tca aca cat 1680
Leu Val Gln Ser Gly Ser Gln Pro Ile Trp Arg Glu Glu Ser Thr His
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Gln Cys Ser Leu Ser Val Arg Ser Ile Lys Ile Ser Glu Asp Ser Arg
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Ser Arg Arg Lys Thr Lys Ile Val Cys Thr Ile Gly Pro Ser Ser Ser
100 105 110

Ser Arg Glu Met Ile Trp Lys Leu Ala Glu Ala Gly Met Asn Val Ala
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Arg Leu Asn Met Ser His Gly Asp His Ala Ser His Gln Ile Thr Ile
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Asp Leu Val Lys Glu Tyr Asn Ser Leu Phe Val Asp Lys Ala Ile Ala
145 150 155 160

Ile Met Leu Asp Thr Lys Gly Pro Glu Val Arg Ser Gly Asp Val Pro
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Gln Pro Ile Phe Leu Glu Glu Gly Gln Glu Phe Asn Phe Thr Ile Lys
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Arg Gly Val Ser Leu Lys Asp Thr Val Ser Val Asn Tyr Asp Asp Phe
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Val Asn Asp Val Glu Val Gly Asp Ile Leu Leu Val Asp Gly Gly Met
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Met Ser Leu Ala Val Lys Ser Lys Thr Ser Asp Leu Val Lys Cys Val
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Val Ile Asp Gly Gly Glu Leu Gln Ser Arg Arg His Leu Asn Val Arg
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Gly Lys Ser Ala Thr Leu Pro Ser Ile Thr Asp Lys Asp Trp Glu Asp
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Val Lys Asp Ala Lys Val Val His Glu Leu Lys Asn Tyr Leu Lys Thr
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Cys Ser Ala Asp Ile Ser Val Ile Val Lys Ile Glu Ser Ala Asp Ser
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Ile Val Ala Thr Asn Met Leu Glu Ser Met Ile Asn His Pro Thr Pro
370 375 380

Thr Arg Ala Glu Val Ser Asp Ile Ala Ile Ala Val Arg Glu Gly Ala
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Asp Ala Ile Met Leu Ser Gly Glu Thr Ala His Gly Lys Phe Pro Leu
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Lys Ala Val Asn Val Met His Thr Val Ala Leu Arg Thr Glu Ala Ser
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Leu Pro Val Arg Thr Ser Ala Ser Arg Thr Thr Ala Tyr Lys Gly His
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Met Gly Gln Met Phe Ala Phe His Ala Ser Ile Met Ala Asn Thr Leu
Seite 51

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455

460

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Leu Ser His Tyr Arg Pro Ser Ala Thr Ile Phe Ala Phe Thr Asn Gln
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Arg Arg Ile Met Gln Arg Leu Ala Leu Tyr Gln Gly Val Met Pro Ile
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Tyr Met Glu Phe Ser Asp Asp Ala Glu Asp Thr Tyr Ala Arg Ser Leu
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Lys Leu Leu Gln Asp Glu Asn Met Leu Lys Glu Gly Gln His Val Thr
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Leu His Leu Pro His Ser Gln Phe Asn Arg Pro Leu Ser Ser Ile Ser	
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ttc cgt cgc ttc cct cta aca acc atc aaa tac act tcc atc aga gcc	144
Phe Arg Arg Phe Pro Leu Thr Thr Ile Lys Tyr Thr Ser Ile Arg Ala	
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tca tcc tcg caa gta ctt ctc tca cct aac ggt act ggt gcc gtg aag	240
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Ser Asp Glu Arg Ser Val Val Ala Thr Ala Val Thr Thr Asp Thr Ser	
85 90 95	
ggg att gag gtt gat act gtg acg gaa gct gag ctt aag gag aat gga	336
Gly Ile Glu Val Asp Thr Val Thr Glu Ala Glu Leu Lys Glu Asn Gly	

110

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act Thr	tgt Cys 130	gga Gly	ttt Phe	gag Glu	cag Gln	ctt Leu 135	gag Glu	gcg Ala	ctt Leu	gct Ala	gtg Val 140	gga Gly	ggg Gly	atg Met	aat Asn	432
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aac Asn	ttg Leu	acg Thr 275	ttt Phe	tgg Trp	aga Arg	gat Asp	gga Gly 280	agt Ser	ctt Leu	gta Val	cga Arg	gag Glu 285	cgt Arg	aat Asn	gcc Ala	864
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BPS64825PC-2008028659

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

Ser Ser Ser Gln Val Leu Leu Ser Pro Asn Gly Thr Gly Ala Val Lys
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Ser Asp Glu Arg Ser Val Val Ala Thr Ala Val Thr Thr Asp Thr Ser
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Gly Ile Glu Val Asp Thr Val Thr Glu Ala Glu Leu Lys Glu Asn Gly
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165 170 175

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275 280 285

Met Leu Pro Thr Ile Ser Ser Lys Asp Trp Leu Asp Ile Asp Phe Gly
Seite 55

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Glu Val Ile Asn His Leu Lys Ser Tyr Leu Ala Ala Arg Ser Arg Gly
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Gly Asp Leu Gly Ala Gln Ile Pro Leu Glu Gln Val Pro Ala Ala Gln
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 Pro Asn Gly Gly Ser Val Ser Thr Arg Ser Glu Lys Leu Leu Lys Pro
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 gcg agt ttt gca gtg aag gtt ctt ggc aac gaa gca aag aga agt gga 144
 Ala Ser Phe Ala Val Lys Val Leu Gly Asn Glu Ala Lys Arg Ser Gly
 35 40 45
 aga gtc tct gta aga agc aga aga gtg gtt gat act act gtg aga tcc 192
 Arg Val Ser Val Arg Ser Arg Arg Val Val Asp Thr Thr Val Arg Ser
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 gct cgt gtt gag act gaa gtc att cct gtt tct cct gaa gat gtg cct 240
 Ala Arg Val Glu Thr Glu Val Ile Pro Val Ser Pro Glu Asp Val Pro
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 aac aga gag gag cag ctt gag agg ttg ttg gaa atg cag cag ttt ggt 288
 Asn Arg Glu Glu Gln Leu Glu Arg Leu Leu Glu Met Gln Gln Phe Gly
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 gat aca tcg gta ggg atg tgg tcg aag ccg aca gtg agg agg aag aca 336
 Asp Thr Ser Val Gly Met Trp Ser Lys Pro Thr Val Arg Arg Lys Thr
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 aag att gtt tgc acc gtt ggt ccg tcg acc aac aca cga gaa atg ata 384
 Lys Ile Val Cys Thr Val Gly Pro Ser Thr Asn Thr Arg Glu Met Ile
 115 120 125
 tgg aaa ttg gct gaa gct ggg atg aat gtt gct agg atg aat atg tct 432
 Trp Lys Leu Ala Glu Ala Gly Met Asn Val Ala Arg Met Asn Met Ser
 130 135 140
 cat gga gat cat gct tca cat aag aag gtt att gat ttg gtt aaa gaa 480
 His Gly Asp His Ala Ser His Lys Lys Val Ile Asp Leu Val Lys Glu
 145 150 155 160
 tac aat gca caa act aaa gac aac act att gct atc atg ctt gac acc 528
 Tyr Asn Ala Gln Thr Lys Asp Asn Thr Ile Ala Ile Met Leu Asp Thr
 165 170 175
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 Lys Gly Pro Glu Val Arg Ser Gly Asp Leu Pro Gln Pro Ile Met Leu
 180 185 190

BPS64825PC-2008028659

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cca Pro	agt Ser 210	tgt Cys	gtc Val	agt Ser	gtt Val	aac Asn 215	tat Tyr	gat Asp	gat Asp	ttc Phe	gtt Val 220	aat Asn	gac Asp	gtg Val	gaa Glu	672
gcg Ala 225	ggt Gly	gac Asp	atg Met	ctt Leu	ctt Leu 230	gtt Val	gat Asp	ggt Gly	ggt Gly	atg Met 235	atg Met	tcg Ser	ttt Phe	atg Met	gtg Val 240	720
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gaa Glu	ctt Leu	aag Lys	tca Ser 260	agg Arg	aga Arg	cac His	ctg Leu	aat Asn 265	gtc Val	cga Arg	gga Gly	aag Lys	agt Ser 270	gca Ala	act Thr	816
tta Leu	cct Pro	tca Ser 275	atc Ile	act Thr	gag Glu	aag Lys	gac Asp 280	tgg Trp	gag Glu	gat Asp	att Ile	aaa Lys 285	ttt Phe	gga Gly	gtg Val	864
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atg Met	cca Pro 450	cct Pro	aat Asn	ctt Leu	ggt Gly	caa Gln 455	gcc Ala	ttc Phe	aag Lys	aac Asn	cat His 460	atg Met	agt Ser	gag Glu	atg Met	1392

BPS64825PC-2008028659

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Val Val Phe Thr Arg Thr Gly Phe Met Ala Ile Leu Leu Ser His Tyr	
485 490 495	
cgt cct tcc ggc aca atc tat gcc ttc aca aat gag aaa aaa ata caa	1536
Arg Pro Ser Gly Thr Ile Tyr Ala Phe 505 Thr Asn Glu Lys Lys Ile Gln	
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Gln Arg Leu Ala Leu Tyr Gln Gly Val Cys Pro Ile Tyr Met Glu Phe	
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Thr Asp Asp Ala Glu Glu Thr Phe Ala Asn Ala Leu Ala Thr Leu Leu	
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Lys Gln Gly Met Val Lys Lys Gly Glu Glu Ile Ala Ile Val Gln Ser	
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Arg Lys Val	

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Ala Arg Val Glu Thr Glu Val Ile Pro Val Ser Pro Glu Asp Val Pro	
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Asn Arg Glu Glu Gln Leu Glu Arg Leu Leu Glu Met Gln Gln Phe Gly	
85 90 95	
Asp Thr Ser Val Gly Met Trp Ser Lys Pro Thr Val Arg Arg Lys Thr	
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Lys Ile Val Cys Thr Val Gly Pro Ser Thr Asn Thr Arg Glu Met Ile	

115

120

125

Trp Lys Leu Ala Glu Ala Gly Met Asn Val Ala Arg Met Asn Met Ser
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His Gly Asp His Ala Ser His Lys Lys Val Ile Asp Leu Val Lys Glu
 145 150 155 160

Tyr Asn Ala Gln Thr Lys Asp Asn Thr Ile Ala Ile Met Leu Asp Thr
 165 170 175

Lys Gly Pro Glu Val Arg Ser Gly Asp Leu Pro Gln Pro Ile Met Leu
 180 185 190

Asp Pro Gly Gln Glu Phe Thr Phe Thr Ile Glu Arg Gly Val Ser Thr
 195 200 205

Pro Ser Cys Val Ser Val Asn Tyr Asp Asp Phe Val Asn Asp Val Glu
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Ala Gly Asp Met Leu Leu Val Asp Gly Gly Met Met Ser Phe Met Val
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Glu Leu Lys Ser Arg Arg His Leu Asn Val Arg Gly Lys Ser Ala Thr
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Leu Pro Ser Ile Thr Glu Lys Asp Trp Glu Asp Ile Lys Phe Gly Val
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Glu Asn Lys Val Asp Phe Tyr Ala Val Ser Phe Val Lys Asp Ala Gln
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Val Val His Glu Leu Lys Lys Tyr Leu Gln Asn Ser Gly Ala Asp Ile
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His Val Ile Val Lys Ile Glu Ser Ala Asp Ser Ile Pro Asn Leu His
 325 330 335

Ser Ile Ile Thr Ala Ser Asp Gly Ala Met Val Ala Arg Gly Asp Leu
 340 345 350

Gly Ala Glu Leu Pro Ile Glu Glu Val Pro Ile Leu Gln Glu Glu Ile
 355 360 365

Ile Asn Leu Cys Arg Ser Met Gly Lys Ala Val Ile Val Ala Thr Asn
 370 375 380

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

Ser Asp Ile Ala Ile Ala Val Arg Glu Gly Ala Asp Ala Val Met Leu
 405 410 415

Ser Gly Glu Thr Ala His Gly Lys Phe Pro Leu Lys Ala Ala Gly Val
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Met His Thr Val Ala Leu Arg Thr Glu Ala Thr Ile Thr Ser Gly Glu
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Met Pro Pro Asn Leu Gly Gln Ala Phe Lys Asn His Met Ser Glu Met
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Phe Ala Tyr His Ala Thr Met Met Ser Asn Thr Leu Gly Thr Ser Thr
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Val Val Phe Thr Arg Thr Gly Phe Met Ala Ile Leu Leu Ser His Tyr
 485 490 495

Arg Pro Ser Gly Thr Ile Tyr Ala Phe Thr Asn Glu Lys Lys Ile Gln
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Gln Arg Leu Ala Leu Tyr Gln Gly Val Cys Pro Ile Tyr Met Glu Phe
 515 520 525

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

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<211> 2769

<212> DNA

<213> Vicia faba

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aagccagaag atagaagttg gatgatagaa gtaaagtaat gttactggtg gagtaccaca 180

atacaagttc atacaaactt tattgtccag aaactaacia agttgagttc agcatagatg 240

aaagacaaaa agaatatatt aaatgacggc tgcaaaataa ggagtaatga atacattgac 300

ctacctacta ctaggctatt tatacacaat attagggtat aataaaatat taaaataccc 360

tctatcagac ttagtcaata agacattcct aaaatataaa ttatttccaa caataatttg 420

BPS64825PC-2008028659

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BPS64825PC-2008028659

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BPS64825PC-2008028659

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 <212> DNA
 <213> Cauliflower mosaic virus

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 <211> 297
 <212> DNA
 <213> Vicia faba

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<210> 34
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 <212> DNA
 <213> *Agrobacterium tumefaciens*

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<210> 35
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 <212> DNA
 <213> *Pisum sativum*

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 accgggtacc 670

<210> 36
 <211> 2046
 <212> DNA
 <213> *Brassica napus*

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BPS64825PC-2008028659

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 <213> Brassica napus

<400> 37

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 Arg Val₅₀ Ser Val Arg Gly Gly₅₅ Arg Lys Val Asp Thr₆₀ Thr Val Arg Ser
 Ala Arg Val Glu Thr Glu₇₀ Val Ile Pro Val Ser₇₅ Pro Glu Asp Val Pro₈₀
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 Asp Thr Ser Val₁₀₀ Gly Met Trp Ser Lys₁₀₅ Pro Thr Val Arg Arg₁₁₀ Lys Thr
 Lys Ile Val₁₁₅ Cys Thr Val Gly Pro₁₂₀ Ser Thr Asn Thr Arg₁₂₅ Glu Met Ile
 Trp Lys₁₃₀ Leu Ala Glu Ala Gly₁₃₅ Met Asn Val Ala Arg₁₄₀ Met Asn Met Ser
 His Gly Asp His Ala Ser₁₅₀ His Lys Lys Val Ile₁₅₅ Asp Leu Val Lys Glu₁₆₀
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 Lys Gly Pro Glu₁₈₀ Val Arg Ser Gly Asp₁₈₅ Leu Pro Gln Pro Ile₁₉₀ Met Leu
 Asp Pro Gly₁₉₅ Gln Glu Phe Thr Phe₂₀₀ Thr Ile Glu Arg Gly₂₀₅ Val Ser Thr
 Pro Ser₂₁₀ Cys Val Ser Val Asn₂₁₅ Tyr Asp Asp Phe Val₂₂₀ Asn Asp Val Glu
 Ala Gly Asp Met Leu Leu₂₃₀ Val Asp Gly Gly Met₂₃₅ Met Ser Phe Met Val₂₄₀
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 Glu Leu Lys Ser₂₆₀ Arg Arg His Leu Asn₂₆₅ Val Arg Gly Lys Ser₂₇₀ Ala Thr
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Val Ser Thr Asp Thr Ala Ala Ile Asp Val Asp Thr Val Thr Glu Ala
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Glu Leu Lys Glu Asn Gly Phe Arg Ser Thr Arg Arg Thr Lys Leu Ile
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Cys Thr Ile Gly Pro Ala Thr Cys Gly Phe Glu Gln Leu Glu Ala Leu
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Ala Glu Gly Gly Met Asn Val Ala Arg Leu Asn Met Cys His Gly Thr
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Glu Lys Gly Phe Ala Val Ala Ile Met Met Asp Thr Glu Gly Arg Glu
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Ile His Met Gly Asp Leu Gly Gly Gly Glu Ser Ser Ala Lys Ser Glu
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Asp Gly Glu Val Gly Thr Phe Thr Val Arg Ala Phe Asp Ser Ser Arg
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BPS64825PC-2008028659

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 260 265 270
 Leu Val Arg Glu Arg Asn Ala Met Leu Pro Thr Ile Ser Ser Lys Asp
 275 280 285
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 Val Ser Phe Val Lys Ser Ala Glu Val Ile Asn His Leu Lys Ser Tyr
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Phe Val Tyr Thr Lys Asn Gly His Met Ala Ser Leu Val Ser Arg Cys
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Ser 545 Glu Asp Met Glu 550 Ser Asn Leu Asn Lys 555 Thr Phe Ser Leu Leu Lys 560

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Leu Ser Leu Ser Val Arg Ala Ile Asn Thr Asn Glu Asp Ser Arg Lys	50	55	60	
Val Lys Val Tyr Ala Glu Asn Gly Ala Phe Asp Leu Gly Val Met Asp	65	70	75	80
Pro Ser Val Glu Pro Tyr Lys Phe Ala Glu Pro Arg Thr Ser His Asn	85	90	95	
Asp Ser Arg Arg Lys Thr Lys Ile Val Cys Thr Ile Gly Pro Ser Ser	100	105	110	

Ser Ser Arg Glu Met Ile Trp Lys Leu Ala Glu Ala Gly Met Asn Val
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Ala Arg Leu Asn Met Ser His Gly Asp His Ala Ser His Gln Ile Thr
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Ile Asp Leu Val Lys Glu Tyr Asn Ser Leu Phe Val Asp Lys Ala Ile
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Ala Ile Met Leu Asp Thr Lys Gly Pro Glu Val Arg Ser Gly Asp Val
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Lys Arg Gly Val Ser Met Lys Asp Thr Val Ser Val Asn Tyr Asp Asp
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Phe Val Asn Asp Val Glu Val Gly Asp Ile Leu Leu Val Asp Gly Gly
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Val Ala Arg Gly Asp Leu Gly Ala Glu Leu Pro Ile Glu Glu Val Pro
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Leu Leu Gln Glu Glu Ile Ile Thr Arg Cys Arg Asn Ile His Lys Pro
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Val Ile Val Ala Thr Asn Met Leu Glu Ser Met Ile Asn His Pro Thr
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Lys His Arg Thr Lys Arg Ile Pro Arg Leu Pro Thr Ile Ala Arg Ile
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Thr Asn His Ile Glu Gly Thr His Leu Asn Ser Pro Asn Gly Ser Pro
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BPS64825PC-2008028659

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

Thr Ile Gly Pro Ser Thr Ser Ser Arg Asp Met Ile Trp Asn Leu Ala
85 90 95

Gln Ala Gly Met Asn Val Ala Arg Leu Asn Met Ser His Gly Asp His
100 105 110

Ala Ser His Leu Gln Thr Ile Asp Leu Val Lys Glu Tyr Asn Ser Gln
115 120 125

Phe Gln Asp Lys Val Val Ala Ile Met Leu Asp Thr Lys Gly Pro Glu
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Val Arg Ser Gly Asp Val Ala Gln Pro Ile Leu Leu Lys Glu Gly Gln
145 150 155 160

Glu Phe Cys Phe Thr Thr Met Arg Gly Val Ser Thr His Asp Thr Val
165 170 175

Ser Val Asn Tyr Asp Gly Phe Val Asn Asp Val Glu Phe Gly Asp Val
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Leu Leu Val Asp Gly Gly Met Met Ser Leu Ala Val Lys Ser Lys Thr
195 200 205

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

Thr Asp Lys Asp Trp Glu Asp Ile Lys Phe Gly Val Asp Asn Gln Val
245 250 255

Asp Phe Phe Ala Val Ser Phe Val Lys Asp Ala Arg Val Val His Glu
260 265 270

Leu Lys His Tyr Leu Lys Ser His Asn Ala Asp Ile His Val Ile Val
275 280 285

Lys Ile Glu Ser Ala Asp Ser Ile Pro Asn Leu His Ser Ile Leu Ser
290 295 300

Ala Ser Asp Gly Ala Met Val Ala Arg Gly Asp Leu Gly Ala Glu Leu
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BPS64825PC-2008028659

Pro Ile Glu Glu Val Pro Leu Leu Gln Glu Asp Ile Ile Arg Arg Cys
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Gln Ile Met Gln Lys Pro Val Ile Val Ala Thr Asn Met Leu Glu Ser
340 345 350

Met Ile Asn His Pro Thr Pro Thr Arg Ala Glu Val Ser Asp Ile Ala
355 360 365

Ile Ala Val Arg Gln Gly Ala Asp Ala Ile Met Leu Ser Gly Glu Thr
370 375 380

Ala His Gly Lys Phe Pro Leu Lys Ala Val Lys Val Met His Thr Val
385 390 395 400

Ala Leu Arg Asn Glu Ser Ser Val Gln Ser Gly Val Ser Tyr Pro Ser
405 410 415

Gln Leu Ser Ser His Glu Ser His Met Gly Glu Met Phe Ala Phe His
420 425 430

Ala Thr Thr Met Ser Asn Thr Leu Asn Thr Pro Ile Ile Val Phe Thr
435 440 445

Arg Thr Gly Ser Met Ala Ile Leu Leu Ser His Tyr Arg Pro Tyr Ser
450 455 460

Thr Ile Phe Ala Phe Thr Asn Glu Ala Arg Ile Lys Gln Arg Leu Ala
465 470 475 480

Leu Tyr His Gly Val Met Ser Ile Tyr Met Gln Phe Ser Asn Asp Val
485 490 495

Glu Glu Thr Phe Ser Arg Ala Leu Lys Leu Leu Leu Ser Lys Ser His
500 505 510

Leu His Glu Gly Gln His Val Thr Leu Val Gln Ser Gly Ala Gln Pro
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Ile Trp Arg Glu Glu Ser Thr His His Ile Gln Val Arg Lys Val His
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Gly
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BPS64825PC-2008028659

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

Glu Asp Leu Glu Asn Leu Ala Leu Gly Gly Met Ser Val Ala Arg Leu
115 120 125

Asn Met Cys His Gly Thr Arg Glu Trp His Arg Asp Val Ile Arg Lys
130 135 140

Ile Lys Lys Leu Asn Glu Glu Lys Gly Phe Cys Val Ser Val Met Ile
145 150 155 160

Asp Thr Glu Gly Ser Gln Ile His Val Val Asp His Gly Ala Pro Ser
165 170 175

Ser Val Lys Val Glu Glu Gly Ser Asn Trp Val Phe Thr Ala Glu His
180 185 190

Tyr Glu Gly Ser Arg Pro Phe Thr Val Gln Thr Asn Tyr Arg Gly Phe
195 200 205

Ser Glu Gly Thr Glu Val Gly Asp Glu Leu Val Ile Asp Gly Gly Met
210 215 220

BPS64825PC-2008028659

Ala Cys Phe Glu Val Thr Glu Lys Thr Gly Asn Asp Leu His Cys Lys
225 230 235 240

Cys Ile Asp Ala Gly Leu Phe Leu Pro Gly Ala Lys Phe Ser Phe Trp
245 250 255

Arg Asp Gly Lys Leu Val Arg Gly Asn Lys Leu Pro Thr Leu Ser
260 265 270

Thr Lys Asp Trp Ala Asp Ile Asp Phe Gly Ile Ala Glu Gly Val Asp
275 280 285

Phe Phe Ala Leu Ser Phe Val Asn His Ala Asp Ser Val Lys Asp Leu
290 295 300

Lys Met Tyr Leu Ser Thr Lys Ser Thr Lys Ser Ile Lys Val Leu Ala
305 310 315 320

Lys Ile Glu Ser Leu Glu Ser Leu His Lys Leu Glu Glu Ile Val Gln
325 330 335

Ala Ser Asp Gly Ile Met Val Ala Arg Gly Asp Leu Gly Val Glu Ile
340 345 350

Pro Leu Glu Gln Ile Pro Thr Val Gln Glu Asp Ile Ile Tyr Val Cys
355 360 365

Arg Gln Leu Asn Lys Pro Val Ile Val Ala Ser Gln Leu Leu Glu Ser
370 375 380

Met Val Glu Tyr Pro Thr Pro Thr Arg Ala Glu Val Ala Asp Val Ser
385 390 395 400

Glu Ala Val Arg Gln Tyr Ala Asp Ala Leu Met Leu Ser Gly Glu Ser
405 410 415

Ala Ile Gly Ser Tyr Gly Arg Lys Ala Leu Ala Val Leu Asp Met Ala
420 425 430

Ser Ser Arg Met Glu Ser Trp Ser Arg Glu Glu Asn Arg Gln Ser Leu
435 440 445

Val Ser His His Gln Leu Gly Glu Ser Leu Pro Glu Cys Ile Thr Glu
450 455 460

Gln Ile Cys Asn Cys Ala Val Glu Met Ala Asn Asn Leu Gly Val Asp
465 470 475 480

Ala Ile Phe Val Tyr Thr Lys Tyr Gly His Met Ala Ser Leu Leu Ser
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BPS64825PC-2008028659

Arg Asn Arg Pro Asn Pro Pro Ile Phe Ala Phe Thr Asn Asp Asp Ser
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Thr Arg Met Ala Leu Thr Leu Gln Trp Gly Val Val Pro Ile Leu Val
515 520 525

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

Glu Leu Gln His Leu Arg Gly Met Gln Gln Leu Gly Asp Thr Ser Val
 85 90 95

Gly Met Trp Ser Lys Pro Thr Phe Arg Arg Lys Thr Lys Val Val Cys
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 Thr Ile Gly Pro Ser Thr Asn Thr Arg Glu Met Ile Trp Lys Leu Ala
 115 120 125
 Glu Thr Gly Met Asn Val Ala Arg Leu Asn Met Ser His Gly Asp His
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 Ala Ser His Gln Lys Ile Ile Asp Leu Val Lys Glu Tyr Asn Ala Gln
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 Ser Lys Asp Asn Val Ile Ala Ile Met Leu Asp Thr Lys Gly Pro Glu
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 Val Arg Ser Gly Asp Leu Pro Gln Pro Ile Asn Leu Thr Thr Gly Gln
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 Glu Phe Thr Phe Thr Ile Arg Arg Gly Val Gly Thr Ala Asp Cys Val
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 Ser Val Asn Tyr Asp Asp Phe Val Asn Asp Val Asp Val Gly Asp Met
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 Leu Leu Val Asp Gly Gly Met Met Ser Leu Val Val Lys Ser Lys Thr
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 Glu Asp Ser Val Lys Cys Glu Val Val Asp Gly Gly Glu Leu Lys Ser
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 Arg Arg His Leu Asn Val Arg Gly Lys Ser Ala Thr Leu Pro Ser Ile
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 Lys Ile Glu Ser Ala Asp Ser Ile Pro Asn Leu His Ser Ile Ile Thr
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 340 345 350
 Pro Ile Glu Glu Val Pro Leu Leu Gln Glu Glu Ile Ile Thr Ile Cys
 355 360 365
 Arg Ser Met Gly Lys Ala Val Ile Val Ala Thr Asn Met Leu Glu Ser

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375

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

Ile Ala Val Arg Glu Gly Ser Asp Ala Ile Met Leu Ser Gly Glu Thr
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Ala His Gly Lys Phe Pro Leu Lys Ala Val Lys Val Met His Thr Val
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Ala Leu Arg Thr Glu Ala Thr Ile Pro Gly Gly Gln Met Pro Pro Asn
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Ile Gly Gln Val Phe Lys Asn His Met Ser Glu Met Phe Ala Tyr His
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Ala Thr Met Met Ser Asn Thr Leu Gly Thr Ser Thr Val Val Phe Thr
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Arg Ser Gly Phe Met Ala Ile Leu Leu Ser His Tyr Arg Pro Ser Gly
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Thr Ile Phe Ala Phe Thr Asp Gln Lys Arg Ile Gln Gln Arg Leu Ala
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Leu Tyr Gln Gly Val Cys Pro Ile Tyr Met Glu Phe Ser Glu Asp Ala
515 520 525

Glu Glu Thr Phe Thr Arg Ala Leu Asp Leu Leu Gln Lys Gln Gly Met
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Seite 86

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 50 55 60
 Ser Leu Ser Ala Gln Asn Ile Ala Glu Asn Thr Ala Asp Ala Thr Ser
 65 70 75 80
 Gln Val Val Ser Ala Asn Ser Arg Arg Lys Thr Lys Ile Val Cys Thr
 85 90 95
 Ile Gly Pro Ser Thr Asn Thr Arg Glu Met Ile Trp Lys Leu Ala Glu
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 Thr Gly Met Asn Val Ala Arg Met Asn Met Ser His Gly Asp His Gln
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 Ser His Gln Lys Val Ile Asp Leu Val Lys Glu Tyr Asn Ala Lys Asn
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 Thr Asp Gly Asn Val Ile Ala Ile Met Leu Asp Thr Lys Gly Pro Glu
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 Val Arg Ser Gly Asp Val Pro Glu Pro Ile Met Leu Glu Glu Gly Gln
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 195 200 205
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 Ala Asp Thr Val Lys Cys Glu Val Val Asp Gly Gly Glu Leu Lys Ser
 225 230 235 240
 Arg Arg His Leu Asn Val Arg Gly Lys Ser Ala Thr Leu Pro Ser Ile
 245 250 255
 Thr Glu Lys Asp Trp Glu Asp Ile Lys Phe Gly Val Glu Asn Gly Val
 260 265 270
 Asp Phe Tyr Ala Val Ser Phe Val Lys Asp Ala Lys Val Ile His Glu
 275 280 285
 Leu Lys Asp Tyr Leu Lys Ser Ala Asn Ala Asp Ile His Val Ile Pro
 290 295 300

Lys Ile Glu Ser Ala Asp Ser Ile Pro Asn Leu Gln Ser Ile Ile Ala
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 Ala Ser Asp Gly Ala Met Val Ala Arg Gly Asp Leu Gly Ala Glu Leu
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 385 390 395 400
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 Ala Gln Arg Thr Glu Ser Ser Leu Tyr Asn Pro Thr Thr Ser Pro Ser
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 Leu Val Ala His Pro Gln Ala Leu Leu Asn Glu Glu Phe Ser Gln Ser
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 Gln Leu Ser Lys Met Phe Gly Ser His Ala Thr Met Met Ala Asn Thr
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 Leu Cys Thr Pro Ile Ile Val Phe Thr Arg Thr Gly Ser Met Ala Val
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 Leu Leu Ser His Tyr Arg Pro Ser Ser Thr Ile Phe Ala Phe Thr Asn
 485 490 495
 Glu Glu Arg Val Lys Gln Arg Leu Ala Leu Tyr Gln Gly Val Val Pro
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 Ile Tyr Met Lys Phe Ser Asp Asp Ala Glu Glu Thr Phe Ser Arg Ala
 515 520 525
 Ile Ser Ser Leu Leu Asn Ala Gln Phe Val Lys Glu Gly Asp Tyr Val
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 Thr Leu Val Gln Ser Gly Val Lys Ser Ile Trp Arg Glu Glu Ser Thr
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 His His Ile Gln Val Arg Lys Val Gln Gly
 565 570

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 <213> Triticum aestivum

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 <213> Triticum aestivum

<400> 51

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Arg Ala Val Ala Ala Arg Val Leu Arg Thr Ser Ala Ser Glu Lys Val
35 40 45

Ala Ala Asp Leu Ser Val Ala Gly Thr Asn Gly Ser Leu Ser Ala Leu
50 55 60

Ser Asn Thr Asp Val Ser Thr Asp Ala Thr Ser Gln Ala Val Asp Ala
65 70 75 80

Thr Pro Arg Arg Lys Thr Lys Ile Val Cys Thr Ile Gly Pro Ser Thr
85 90 95

Asn Thr Arg Glu Met Ile Trp Lys Leu Ala Glu Thr Gly Met Asn Val
100 105 110

Ala Arg Met Asn Met Ser His Gly Asp His Gln Ser His Gln Lys Val
115 120 125

Ile Asp Leu Val Lys Glu Tyr Asn Ala Gln Asn Thr Asp Gly Asn Thr
Seite 90

130

135

140

Val Ala Ile Met Leu Asp Thr Lys Gly Pro Glu Val Arg Ser Gly Asp
 145 150 155 160

Leu Pro Glu Pro Ile Met Leu Ala Glu Gly Gln Glu Phe Asn Phe Thr
 165 170 175

Ile Lys Arg Gly Val Ser Thr Glu Asp Thr Val Ser Val Asn Tyr Asp
 180 185 190

Asp Phe Ile Ser Asp Val Glu Ala Gly Asp Ile Leu Leu Val Asp Gly
 195 200 205

Gly Met Met Ser Leu Ala Val Lys Ser Lys Thr Ala Asp Thr Val Lys
 210 215 220

Cys Val Val Val Asp Gly Gly Glu Leu Lys Ser Arg Arg His Leu Asn
 225 230 235 240

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

Ser Phe Val Lys Asp Ala Lys Val Ile His Glu Leu Lys Ala Tyr Leu
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Lys Ser Ala Asn Ala Asp Ile His Val Ile Pro Lys Ile Glu Ser Ala
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Asp Ser Ile Pro Asn Leu Gln Ser Ile Ile Ala Ala Ser Asp Gly Ala
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Met Val Ala Arg Gly Asp Leu Gly Ala Glu Leu Pro Ile Glu Glu Val
 325 330 335

Pro Leu Leu Gln Glu Glu Ile Ile Arg Thr Cys Arg Ser Met Gln Lys
 340 345 350

Pro Val Ile Val Ala Thr Asn Met Leu Glu Ser Met Ile Asp His Pro
 355 360 365

Thr Pro Thr Arg Ala Glu Val Ser Asp Ile Ala Ile Ala Val Arg Glu
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Ala Ala Asp Ala Ile Met Leu Ser Gly Glu Thr Ala His Gly Lys Tyr
 385 390 395 400

Pro Leu Lys Ala Val Lys Val Met His Thr Val Ala Leu Arg Thr Glu
 405 410 415

BPS64825PC-2008028659

Ser Ser Leu Tyr Asp Pro Thr Lys Ala Pro Ser Leu Val Ala Arg Pro
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Lys Ala Leu Leu Asn Asp Asp Phe Cys Lys Ser Gln Leu Ser Lys Met
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Phe Gly Ser His Ala Thr Met Met Ala Asn Thr Leu Arg Thr Pro Ile
450 455 460

Ile Val Phe Thr Arg Val Gly Ser Met Ala Val Leu Leu Ser His Tyr
465 470 475 480

Arg Pro Ser Ser Thr Ile Tyr Ala Phe Thr Asn Glu Val Arg Val Lys
485 490 495

Gln Arg Leu Ala Leu Tyr Gln Gly Val Val Pro Ile Leu Met Glu Phe
500 505 510

Ser Asp Asp Ala Glu Glu Thr Phe Ser Arg Ala Ile Thr Ser Leu Leu
515 520 525

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

Gly Ser Gln Ser Ile Trp Arg Glu Glu Ser Thr His His Ile Gln Val
545 550 555 560

Arg Lys Val Gln Cys
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<213> Zea mays

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 <213> Zea mays

<400> 53

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Ala Ser Val Gly Glu Ala Thr Met Asp Val Val Ser Glu Ala Glu Leu
 35 40 45

Arg Glu Lys Gly Phe Leu Gly Met Arg Lys Thr Lys Leu Val Cys Thr
 50 55 60

Val Gly Pro Ala Cys Val Glu Ala Leu Pro Ala Leu Ala Arg Gly Gly
 65 70 75 80

Met Gly Val Ala Arg Ile Asn Leu Cys His Gly Gly Arg Glu Trp His
 85 90 95

Arg Ala Ala Met Arg Ser Val Arg Arg Leu Asn Glu Glu Gly Gly Phe
 100 105 110

Cys Val Thr Leu Met Val Asp Thr Glu Gly Ser Gln Leu Leu Val Ala
 115 120 125

Asp His Gly Gly Ala Thr Ser Val Lys Ala Glu Asp Gly Ser Glu Trp
 130 135 140

Ile Phe Thr Asn Lys Lys Ala Asp Glu Ala His Gln Phe Thr Met His
 145 150 155 160

Val Asn Phe Asp Lys Phe Ser Glu Gly Ile Leu Val Gly Asp Glu Leu
 165 170 175

Val Ile Asp Gly Gly Met Ala Thr Phe Glu Val Thr Glu Lys Ile Gly
 180 185 190

Asn Asp Leu Arg Cys Lys Cys Thr Asp Pro Gly Leu Leu Leu Pro Arg
 195 200 205

Ala Lys Leu Ser Phe Trp Arg Asn Gly Lys Ile Val Gln Arg Asn Phe
 210 215 220

Gly Leu Pro Thr Leu Ser Thr Lys Asp Trp Ala Asp Ile Glu Phe Gly
 225 230 235 240

Ile Ala Glu Gly Val Asp Cys Ile Ala Leu Ser Phe Val Asn Asp Ala
 245 250 255

Asn Asp Ile Lys Gln Leu Lys Ala Tyr Leu Ser Arg Arg Ser Leu Glu
 260 265 270

His Ile Lys Val Phe Ala Lys Ile Glu Ser Leu Glu Ser Leu Lys Asn
 275 280 285

Leu Lys Asp Ile Ile Glu Ala Ser Asp Gly Val Met Val Ala Arg Gly
 290 295 300

Asp Leu Gly Val Gln Ile Pro Leu Glu Gln Ile Pro Ala Ile Gln Glu
 Seite 94

305 310 315 320

Ser Ile Val Lys Leu Cys Arg His Leu Asn Lys Pro Val Ile Val Ala
325 330 335

Ser Gln Leu Leu Glu Ser Met Val Glu Tyr Pro Thr Pro Thr Arg Ala
340 345 350

Glu Val Ala Asp Val Ser Glu Ala Val Arg Gln Tyr Ala Asp Ala Val
355 360 365

Met Leu Ser Ala Glu Ser Ala Ile Gly Ala Tyr Pro Gln Lys Ala Leu
370 375 380

Ser Val Leu Arg Ala Ala Ser Glu Arg Met Glu Ser Trp Ser Arg Glu
385 390 395 400

Glu Asn Met Gln Lys Leu Leu Pro Arg His Gln Leu Ala Ile Ala Leu
405 410 415

Pro Asp Arg Ile Ser Glu Gln Ile Cys Ser Cys Ala Val Glu Met Ala
420 425 430

Asn Asn Leu Ala Val Asp Ala Ile Phe Val Tyr Thr Lys His Gly His
435 440 445

Met Ala Ser Leu Leu Ser Arg Asn Arg Pro Asn Pro Pro Ile Phe Ala
450 455 460

Phe Thr Asp Asn Ala Asn Ser Arg Lys Ser Met Asn Leu Tyr Trp Gly
465 470 475 480

Val Ile Pro Leu His Leu Pro Leu Ser Asn Ser Met Glu Asp Asn Phe
485 490 495

Asn Lys Thr Ile Ser Leu Met Arg Ser Lys Gly Ser Val Lys Pro Gly
500 505 510

Asp Thr Val Leu Val Val Ser Asp Ser Asp Leu Asn Gln Pro Cys Ala
515 520 525

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<212>	DNA
<213>	Zea mays

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taggtccctc	aaccaacact	cgtgagatga	tttggaagct	tgacagagact	ggaatgaatg			480
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<400> 55

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 35 40 45

Thr Glu Ala Leu Thr Ala Asp Leu Ala Gly Thr Thr Asn Gly Ala Val
 50 55 60

His Ala Arg Met Asn Ser Lys Ala Thr Ser Glu Ile Thr Ser Gln Ala
 65 70 75 80

Val Thr Ala Asn Ser Arg Arg Lys Thr Lys Ile Val Cys Thr Ile Gly
 85 90 95

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

Met Asn Val Ala Arg Leu Asn Met Ser His Gly Asp His Gln Ser His
 115 120 125

Gln Lys Val Ile Asp Leu Val Lys Glu Tyr Asn Ala Gln Asn Thr Asp
 130 135 140

Gly Asn Val Ile Ala Ile Met Leu Asp Thr Lys Gly Pro Glu Val Arg
 145 150 155 160

Ser Gly Asp Val Pro Glu Pro Ile Met Leu Lys Glu Gly Gln Glu Phe
 165 170 175

Asn Phe Thr Ile Lys Arg Gly Val Ser Thr Glu Asp Thr Val Ser Val
 180 185 190

Asn Tyr Asp Asp Phe Ile Asn Asp Val Glu Ala Gly Asp Ile Leu Leu
 195 200 205

Val Asp Gly Gly Met Met Ser Leu Ala Val Lys Ser Lys Thr Thr Asp
 210 215 220

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

His Leu Asn Val Arg Gly Lys Ser Ala Thr Leu Pro Ser Ile Thr Glu
 245 250 255
 Lys Asp Trp Glu Asp Ile Lys Phe Gly Val Glu Asn Gly Val Asp Phe
 260 265 270
 Tyr Ala Val Ser Phe Val Lys Asp Ala Lys Val Ile His Glu Leu Lys
 275 280 285
 Asp Tyr Leu Lys Ser Ala Asn Ala Asp Ile His Val Ile Pro Lys Ile
 290 295 300
 Glu Ser Ala Asp Ser Ile Pro Asn Leu Gln Ser Ile Ile Ala Ala Ser
 305 310 315 320
 Asp Gly Ala Met Val Ala Arg Gly Asp Leu Gly Ala Glu Leu Pro Ile
 325 330 335
 Glu Asp Val Pro Leu Leu Gln Ala Glu Ile Val Gln Thr Cys Arg Ser
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 Met Glu Lys Pro Val Ile Val Ala Thr Asn Met Leu Glu Ser Met Ile
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 370 375 380
 Val Arg Glu Gly Ala Asp Ala Ile Met Leu Ser Gly Glu Thr Ala His
 385 390 395 400
 Gly Lys Tyr Pro Leu Lys Ala Val Lys Val Met His Thr Val Ala Leu
 405 410 415
 Arg Thr Glu Ser Ser Leu Tyr Asn Pro Thr Thr Ser Pro Ser Leu Val
 420 425 430
 Ala Ser Ala Gln Gly Leu Gln Asn Glu Asp Phe Ser Pro Ser Gln Leu
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 Ser Lys Met Phe Gly Ser His Ala Thr Met Met Ala Asn Thr Leu Arg
 450 455 460
 Thr Pro Ile Ile Val Phe Thr Gln Thr Gly Ser Met Ala Val Leu Leu
 465 470 475 480
 Ser His Tyr Arg Pro Ser Ser Thr Leu Phe Ala Phe Thr Asn Glu Glu
 485 490 495
 Arg Val Lys Gln Arg Leu Ala Leu Tyr Gln Gly Val Ile Pro Ile His
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 Met Gln Phe Ser Asp Asp Ala Glu Glu Thr Phe Ser Arg Ala Ile Ser
 Seite 98

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Ser Leu Leu Lys Ala Gln Tyr Val Lys Lys Gly Asp Tyr Val Thr Leu
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Ile Gln Val Arg Lys Val Gln Val
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<213> Zea mays

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BPS64825PC-2008028659

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Thr Ala Ser Asp Leu Thr Ala Phe Pro Pro Asn Pro Asn Gly Ile Phe
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Ala Ser Asp Arg Pro Ile Asp Val Asp Ala Ala Thr Glu Ala Glu Leu
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Arg Glu Asn Gly Phe Arg Ser Thr Arg Arg Thr Lys Leu Val Cys Thr
 85 90 95

Val Gly Pro Ala Thr Ser Arg Pro Asp Gln Leu Glu Ala Leu Ala Val
 100 105 110

Gly Gly Met Asn Val Ala Arg Leu Asn Met Cys His Gly Asp Arg Glu
 115 120 125

Trp His Arg Ala Ala Ile Arg Ala Val Arg Ser Leu Asn Glu Glu Lys
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BPS64825PC-2008028659

Gly Phe Ala Val Ala Val Met Met Asp Thr Glu Gly Ser Glu Ile His
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 Met Gly Asp Leu Gly Gly Ala Ser Ser Val Lys Ala Glu Asp Gly Glu
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 Val Trp Thr Phe Ser Val Arg Ser Phe Glu Leu Pro Leu Pro Glu Arg
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 Thr Ile Asn Val Asn Tyr Asp Gly Phe Ala Glu Asp Val Arg Val Gly
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 Asp Glu Leu Leu Val Asp Gly Gly Met Ala Arg Phe Glu Val Ile Glu
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 Ile Asp Phe Gly Ile Ala Glu Gly Val Asp Phe Ile Ala Val Ser Phe
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 Val Lys Ser Ala Glu Val Ile Arg His Leu Lys Ser Tyr Ile Ala Ala
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 Arg Ser Arg Gly Ser Asp Met Ala Val Ile Ala Lys Ile Glu Ser Ile
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 Asp Ser Leu Lys Asn Leu Glu Glu Ile Ile Arg Ala Ser Asp Gly Ala
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 Met Val Ala Arg Gly Asp Met Gly Ala Gln Val Pro Leu Glu Gln Val
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 Pro Ser Ile Gln Gln Lys Ile Val Gln Leu Cys Arg Gln Leu Asn Lys
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 Pro Val Ile Val Ala Ser Gln Leu Leu Glu Ser Met Ile Glu Tyr Pro
 370 375 380
 Thr Pro Thr Arg Ala Glu Val Ala Asp Val Ser Glu Ala Val Arg Gln
 385 390 395 400
 Arg Ala Asp Ala Leu Met Leu Ser Gly Glu Ser Ala Met Gly Arg Tyr
 405 410 415

BPS64825PC-2008028659

Pro Asp Lys Ala Leu Ser Val Leu Arg Ser Val Ser Leu Arg Ile Glu
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Lys Trp Trp Arg Glu Glu Lys Arg His Glu Ala Leu Glu Leu Arg Ser
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Val Ser Ser Ser Phe Ser Asp Lys Ile Ser Glu Glu Ile Cys Asn Ser
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Ala Ala Lys Met Ala Asn Gly Leu Gly Val Asp Ala Val Phe Val Phe
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Thr Lys Thr Gly His Met Ala Ser Leu Leu Ser Arg Cys Arg Pro Asp
485 490 495

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

Ser Gln Val Val Ser Val Ile Ser Arg Ala Pro Arg Pro Asp Ala Gly
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 Val Leu Pro Val Ser Pro Asp Asp Asp Ala Ala Val Lys Glu Glu Ala
 65 70 75 80
 Asn Phe Gln His Leu Lys Ala Ile Gln Gln Leu Ala Thr Ala Ala Asn
 85 90 95
 Gly Val Trp Ser Lys Pro Asn Val Arg Arg Lys Thr Lys Ile Val Cys
 100 105 110
 Thr Ile Gly Pro Ser Thr Asn Thr Arg Asp Met Ile Trp Lys Leu Ala
 115 120 125
 Glu Thr Gly Met Asn Val Ala Arg Leu Asn Met Ser His Gly Asp His
 130 135 140
 Ala Ser His Gln Lys Val Ile Asp Leu Val Lys Glu Tyr Asn Ala Ser
 145 150 155 160
 His Ala Asp Asn Val Ile Ala Ile Met Leu Asp Thr Lys Gly Pro Glu
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 Val Arg Ser Gly Asp Leu Pro Gln Pro Ile Phe Leu Glu Ser Gly Gln
 180 185 190
 Glu Phe Thr Phe Thr Ile Lys Arg Gly Val Gly Thr Asp Thr Cys Val
 195 200 205
 Ser Val Asn Tyr Asp Asp Phe Val Asn Asp Val Glu Val Gly Asp Met
 210 215 220
 Leu Leu Val Asp Gly Gly Met Met Ser Phe Leu Val Lys Ser Lys Thr
 225 230 235 240
 Glu Asp Ser Val Lys Cys Glu Val Ile Asp Gly Gly Glu Leu Lys Ser
 245 250 255
 Arg Arg His Leu Asn Val Arg Gly Lys Ser Ala Thr Leu Pro Ser Ile
 260 265 270
 Thr Asp Lys Asp Trp Asp Asp Ile Lys Phe Gly Val Asp Asn Gln Val
 275 280 285
 Asp Tyr Tyr Ala Val Ser Phe Val Lys Asp Ala Gln Val Val His Glu
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 Leu Lys Asp Tyr Leu Lys Ser Cys Asn Ala Asp Ile His Val Ile Val
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BPS64825PC-2008028659

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 Pro Ile Glu Glu Val Pro Leu Leu Gln Glu Glu Ile Ile Arg Met Cys
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 Arg Ser Met Gly Lys Ala Val Ile Val Ala Thr Asn Met Leu Glu Ser
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 Ile Ala Val Arg Glu Gly Ala Asp Ala Val Met Leu Ser Gly Glu Thr
 405 410 415
 Ala His Gly Lys Phe Pro Leu Lys Ala Val Lys Val Met His Thr Val
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 Ala Leu Arg Thr Glu Ala Thr Ile Pro Gly Gly Glu Thr Pro Ala Asp
 435 440 445
 Leu Gly Gln Ala Phe Lys Asn His Met Ser Glu Met Phe Ala Tyr His
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 Ala Thr Met Met Ser Asn Thr Leu Arg Thr Ser Ile Val Val Phe Thr
 465 470 475 480
 Arg Thr Gly Phe Met Ala Ile Leu Leu Ser His Tyr Arg Pro Ser Gly
 485 490 495
 Thr Ile Phe Ala Phe Thr Asp Glu Glu Arg Val Arg Gln Arg Leu Ala
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 Leu Tyr Gln Gly Val Cys Pro Val Gln Met Glu Phe Ser Asp Asp Ala
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 530 535 540
 Val Lys Asp Gly Glu Glu Val Ala Leu Val Gln Ser Gly Lys His Pro
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 Ile Trp Arg Ser Gln Ser Thr His Asn Ile Gln Val Arg Lys Ile
 565 570 575