

SEQUENCE LISTING

<110> BASF Plant Science GmbH

<120> Plants having increased yield-related traits and a method for making the same

<130> PF60513

<160> 33

<170> PatentIn version 3.3

<210> 1

<211> 1371

<212> DNA

<213> *Phaeodactylum tricornutum*

<400> 1

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Tyr Ser Ile Leu Ala Ser Ala Leu Met Ser Val Phe Ile Asn Ile Lys
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Gly Tyr Ser Ile Leu Ala Ser Ala Leu Met Ser Val Phe Ile Asn Ile
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Ile Trp Phe Ala Ile Ala Pro Leu Leu Ser Glu Ile Arg Asp Asp Ile
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Gly Ile Thr Lys Gln Asp Val Trp Thr Ser Ser Ile Val Gly Val Gly
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Gly Thr Ile Leu Met Arg Phe Ile Met Gly Pro Met Cys Asp Lys Tyr
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1540

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<213> *Cylindrotheca fusiformis*

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Thr Ala Cys Thr Gly Phe Val Asn Ser Ala Thr Ser Leu Ala Val Leu
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145 150 155 160

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

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

Ile Met Gly Ala Val Ile Cys Ala Ser Ser Val Leu Ser Val Phe Ile
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Cys Ile Pro Gly Ser Ser Arg Met Ile Gly Gly Glu Ala Asp Asp Val
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<210> 10

<211> 438
<212> PRT
<213> Cylindrotheca fusiformis

<400> 10

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20 25 30

Asp Leu Asp Lys Lys Glu Val Trp Thr Ser Ser Ile Val Gly Val Gly
35 40 45

Gly Thr Ile Phe Met Arg Phe Leu Leu Gly Pro Phe Cys Asp Lys Ile
50 55 60

Gly Pro Arg Val Leu Phe Thr Phe Val Leu Cys Phe Ala Ser Ile Pro
65 70 75 80

Thr Ala Cys Thr Gly Phe Val Asn Ser Ala Thr Ser Leu Ala Val Leu
85 90 95

Arg Leu Phe Ile Gly Thr Ala Gly Gly Thr Phe Val Met Cys Gln Tyr
100 105 110

Trp Thr Ser Arg Met Phe Thr Lys Gln Val Val Gly Thr Ala Asn Ala
115 120 125

Leu Val Gly Gly Trp Gly Asn Leu Gly Gly Gly Val Thr Gln Leu Val
130 135 140

Met Gly Ser Ala Leu Phe Pro Leu Phe Lys Glu Ile Phe Lys Asn Glu
145 150 155 160

Pro Asp Pro Ala Glu Thr Ala Trp Arg Trp Val Ser Ile Val Pro Ala
165 170 175

Val Val Ala Phe Ala Ile Gly Leu Leu Ile Phe Phe Tyr Ser Asp Asp
180 185 190

Ala Pro Lys Gly Asn Tyr His Glu Met Lys Lys Asn Gly Ala Met Ala
195 200 205

Asp Val Ser Ala Ala Ala Ser Phe Arg Thr Gly Ala Leu Asn Leu Asn
210 215 220

Thr Trp Phe Leu Phe Ile Gln Tyr Ala Cys Cys Phe Gly Val Glu Leu
225 230 235 240

Thr Met Asn Asn Ala Ala Val Leu Tyr Phe Lys Glu Lys Phe Ser Leu
245 250 255

Thr Thr Glu Glu Ala Ala Ala Ile Ala Ser Ile Phe Gly Trp Met Asn
260 265 270

Leu Phe Ala Arg Gly Ala Gly Gly Phe Leu Ser Asp Lys Ala Asn Ala
275 280 285

Arg Met Gly Met Arg Gly Arg Leu Trp Thr Gln Thr Ile Leu Leu Ala
290 295 300

Cys Glu Gly Ala Leu Val Leu Val Phe Ala Asn Thr Gly Ser Leu Thr
305 310 315 320

Gly Ala Ile Val Val Met Val Phe Phe Ser Leu Phe Val Gln Ala Ala
325 330 335

Glu Gly Ser Ser Tyr Gly Ile Val Pro Tyr Val Asp Pro Pro Ala Thr
340 345 350

Gly Ala Ile Ala Gly Ile Ile Gly Ala Gly Gly Asn Thr Gly Ala Val
355 360 365

Ala Phe Gly Met Gly Phe Arg Gln Leu Asp Tyr Lys Asp Ala Phe Ile
370 375 380

Ile Met Gly Ala Val Ile Cys Ala Ser Ser Val Leu Ser Val Phe Ile
385 390 395 400

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

Gly Ala Lys Asp Pro Thr Leu Ser Val Pro Glu Pro Asp Thr Gln Lys
420 425 430

Thr Gln Asp Val Asn Ala
435

<210> 11
<211> 1525
<212> DNA
<213> *Thalassiosira weissflogii*

<400> 11

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cttccatccc atgtgccctg accggcctcg taaaaaactc cgcgagctt tgtgttctcc	300
gtttcttcat tggtttgggg ggatccacct tcgtcatgtg tcaatactgg tcgtctcgta	360
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<210> 12
 <211> 442
 <212> PRT
 <213> Thalassiosira weissflogii

<400> 12

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

Ala Ala Ser Tyr Phe Lys Ser Thr Phe Glu Leu Thr Thr Glu Ser Ala
 245 250 255

Ala Ala Ile Ala Ser Ile Phe Gly Trp Met Asn Leu Phe Ala Arg Gly
 260 265 270

Leu Gly Gly Phe Phe Ser Asp Lys Leu Asn Ser Lys Met Gly Met Arg
 275 280 285

Gly Arg Leu Ile Val Gln Thr Ile Cys Leu Val Ala Glu Gly Val Leu
 290 295 300

Val Phe Val Phe Ala Asn Thr Pro Gln Leu Trp Ala Ala Ile Leu Val
 305 310 315 320

Met Val Phe Phe Ser Met Phe Val Gln Ala Ala Glu Gly Ser Thr Tyr
 325 330 335

Gly Ile Val Pro Tyr Val Asn Pro Pro Ala Thr Gly Ser Ile Ala Gly
 340 345 350

Ile Val Gly Ala Gly Gly Asn Thr Gly Ala Val Cys Phe Gly Leu Gly
 355 360 365

Phe Arg Gln Leu Glu Ala Lys Pro Ala Phe Tyr Leu Met Gly Gly Cys
 370 375 380

Ile Val Ala Ser Gly Val Leu Ser Leu Phe Ile Cys Ile Lys Gly His
 385 390 395 400

Ala Gly Leu Val Thr Gly Gln Asp Asn Pro Glu Val Ile Ala Ala Tyr
 405 410 415

Lys Lys Thr Ala Gly Ala Ala Ser Ala Thr Ile Gln Val Pro Glu Pro
 420 425 430

Asp Ala Glu Ala Ala Glu Glu Met Glu Lys
 435 440

<210> 13
 <211> 1751
 <212> DNA
 <213> Thalassiosira pseudonana

<400> 13
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atctggttcg ccattgcacc actcatgtcc gaggtgcaat tgactcttgg actctccaaa	300
caacagattt ggacttcaaa catctgctca gtcgctggta ccacgtgat gcgtttcatc	360
aacggccctc tctgcgacaa gtacggagct cgaattctta tgggtgtcgt cctcttcgct	420
gcctctattc catgtgctct tactggactc gtaaacgatg ctacatcgtt ttccatcctt	480
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gcaggaatcg ttacagttaa ggtttctgac gacgcaccaa agggaaatta ctccgagatg	780
aagaagaacg gtaccatgcc cgaagtgtca gccgctgcat ccttccgagg tggagccatg	840
aacctcaaca cctggcttct cttcttccag tacgcatgct gcttcggggg tgaacttacc	900
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ctacttcttg a	1751

<210> 14
 <211> 482
 <212> PRT

<213> Thalassiosira pseudonana

<400> 14

Met Ser Glu Val Gln Ser Gly Gln Ala Thr Glu Ile Lys Lys Tyr Gln
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Glu Tyr Phe Val Lys Val Asp Pro Asp Gln Asp Asp Lys Ala Thr Glu
20 25 30

Ile Lys Leu Leu Ser Phe Lys Arg Pro His Met Arg Ala Phe His Cys
35 40 45

Ser Trp Met Cys Phe Phe Thr Ala Phe Phe Ile Trp Phe Ala Ile Ala
50 55 60

Pro Leu Met Ser Glu Val Gln Leu Thr Leu Gly Leu Ser Lys Gln Gln
65 70 75 80

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

Phe Ile Asn Gly Pro Leu Cys Asp Lys Tyr Gly Ala Arg Ile Leu Met
100 105 110

Gly Val Val Leu Phe Ala Ala Ser Ile Pro Cys Ala Leu Thr Gly Leu
115 120 125

Val Asn Asp Ala Thr Ser Leu Ser Ile Leu Arg Phe Phe Ile Gly Leu
130 135 140

Gly Gly Ser Thr Phe Val Met Cys Gln Tyr Trp Thr Ser Arg Met Phe
145 150 155 160

Thr Lys Glu Val Ala Gly Thr Ala Asn Ala Ile Val Gly Gly Trp Gly
165 170 175

Asn Leu Gly Gly Gly Val Thr Gln Leu Val Met Gly Ser Val Leu Phe
180 185 190

Pro Leu Phe Lys Leu Gly Met Ser Ala Glu Gln Ala Trp Arg Thr Val
195 200 205

Cys Val Val Pro Ala Ile Val Gly Met Ile Ala Gly Ile Val Thr Val
210 215 220

Lys Val Ser Asp Asp Ala Pro Lys Gly Asn Tyr Ser Glu Met Lys Lys

225					230					235				240	
Asn	Gly	Thr	Met	Pro	Glu	Val	Ser	Ala	Ala	Ala	Ser	Phe	Arg	Gly	Gly
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Ala	Met	Asn	Leu	Asn	Thr	Trp	Leu	Leu	Phe	Phe	Gln	Tyr	Ala	Cys	Cys
			260					265					270		
Phe	Gly	Val	Glu	Leu	Thr	Met	Asn	Asn	Ala	Ala	Ala	Ser	Tyr	Phe	Lys
		275					280					285			
Thr	Lys	Phe	Glu	Leu	Thr	Thr	Glu	Ser	Ala	Ala	Ala	Ile	Ala	Ser	Ile
	290					295					300				
Phe	Gly	Trp	Met	Asn	Leu	Phe	Ala	Arg	Gly	Leu	Gly	Gly	Phe	Ala	Ser
305					310					315					320
Asp	Lys	Ala	Asn	Ala	Lys	Met	Gly	Met	Arg	Gly	Arg	Leu	Ala	Trp	Gln
			325						330					335	
Thr	Leu	Cys	Leu	Val	Met	Glu	Gly	Val	Met	Val	Phe	Ile	Phe	Ala	Asn
			340					345					350		
Thr	Asn	Ser	Leu	Gly	Val	Ala	Ile	Phe	Ile	Met	Val	Ile	Phe	Ser	Ser
		355					360					365			
Phe	Val	Gln	Ala	Ala	Glu	Gly	Ser	Thr	Tyr	Gly	Ile	Val	Pro	Tyr	Val
	370					375					380				
Asn	Pro	Pro	Cys	Thr	Gly	Ser	Ile	Ser	Gly	Ile	Val	Gly	Ala	Gly	Gly
385					390					395					400
Asn	Val	Gly	Ala	Val	Cys	Phe	Gly	Leu	Gly	Phe	Arg	Gln	Leu	Glu	Thr
				405					410					415	
Lys	Gln	Ala	Phe	Val	Leu	Met	Ala	Ser	Cys	Ile	Val	Val	Ser	Gly	Val
			420					425					430		
Ile	Ser	Ala	Phe	Val	Cys	Ile	Lys	Gly	His	Ala	Gly	Leu	Phe	Thr	Gly
		435					440					445			
Gln	Asp	Ser	Asp	Glu	Val	Ile	Ala	Ala	Tyr	Lys	Gly	Gln	Lys	Thr	Ala
	450					455					460				
Thr	Thr	Leu	Gln	Val	Pro	Glu	Gln	Asp	Ala	Glu	Ala	Ala	Glu	Ala	Ile
465					470					475					480

Glu Glu

<210> 15
<211> 1783
<212> DNA
<213> *Thalassiosira pseudonana*

<400> 15
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tttagggaat agaatactaa tataactatg tttctaataca acg 1783

<210> 16
<211> 489
<212> PRT
<213> *Thalassiosira pseudonana*
<400> 16

Met Ser Ser Ala Val Ser Ser Gly Gln Ala Glu Ile Lys Lys Tyr Gln
1 5 10 15

Glu Tyr Phe Ile Lys Val Asp Pro Asp Gln Asp Asp Lys Ala Thr Glu
20 25 30

Ile Lys Leu Leu Ser Phe Lys Arg Pro His Met Arg Ala Phe His Cys
35 40 45

Ser Trp Ile Cys Phe Phe Thr Ala Phe Phe Ile Trp Phe Ala Ile Ala
50 55 60

Pro Leu Met Ser Glu Val Gln Leu Thr Leu Gly Leu Ser Lys Gln Gln
65 70 75 80

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

Phe Ile Asn Gly Pro Leu Cys Asp Lys Tyr Gly Ala Arg Ile Leu Met
100 105 110

Gly Val Val Leu Phe Ala Ala Ser Ile Pro Cys Ala Leu Thr Gly Leu
115 120 125

Val Asn Asp Ala Thr Ser Leu Ser Ile Leu Arg Phe Phe Ile Gly Leu
130 135 140

Gly Gly Ser Thr Phe Val Met Cys Gln Tyr Trp Thr Ser Arg Met Phe
145 150 155 160

Thr Lys Glu Val Ala Gly Thr Ala Asn Ala Ile Val Gly Gly Trp Gly
165 170 175

Asn Leu Gly Gly Gly Val Thr Gln Leu Val Met Gly Ser Val Leu Phe
180 185 190

Pro Leu Phe Lys Leu Gly Met Ser Ala Glu Gln Ala Trp Arg Thr Val
195 200 205

Cys Val Val Pro Ala Ile Val Gly Met Ile Ala Gly Ile Val Thr Val
210 215 220

Lys Val Ser Asp Asp Ala Pro Lys Gly Asn Tyr Ser Glu Met Lys Lys
225 230 235 240

Asn Gly Thr Met Pro Glu Val Ser Ala Ala Ala Ser Phe Arg Gly Gly
245 250 255

Ala Met Asn Phe Asn Thr Trp Leu Leu Phe Phe Gln Tyr Ala Cys Cys
260 265 270

Phe Gly Val Glu Leu Thr Met Asn Asn Ala Ala Ala Ser Tyr Phe Lys
275 280 285

Thr Lys Phe Glu Leu Thr Thr Glu Ser Ala Ala Ala Ile Ala Ser Ile
290 295 300

Phe Gly Trp Met Asn Leu Phe Ala Arg Gly Leu Gly Gly Phe Val Ser
305 310 315 320

Asp Lys Ala Asn Ala Lys Met Gly Met Arg Gly Arg Leu Ala Trp Gln
325 330 335

Thr Leu Cys Leu Val Met Glu Gly Val Met Val Phe Ile Phe Ala Asn
340 345 350

Thr Asn Ser Leu Gly Leu Ala Ile Phe Ile Met Val Ile Phe Ser Ser
355 360 365

Phe Val Gln Ala Ala Glu Gly Ser Thr Tyr Gly Ile Val Pro Tyr Val
370 375 380

Asn Pro Pro Cys Thr Gly Ser Ile Ser Gly Ile Val Gly Ala Gly Gly
385 390 395 400

Asn Val Gly Ala Val Cys Phe Gly Leu Gly Phe Arg Gln Leu Glu Thr
405 410 415

Lys Gln Ala Phe Val Leu Met Ala Ser Cys Ile Val Val Ser Gly Val
420 425 430

Ile Ser Ala Leu Ile Phe Ile Lys Gly His Ala Gly Leu Phe Thr Gly
435 440 445

Gln Asp Ser Asp Glu Val Ile Ala Ala Tyr Lys Lys Ala Gly Gly Ala
450 455 460

Val Pro Thr Thr Leu Gln Val Pro Glu Pro Asp Ala Glu Val Ala Ala
465 470 475 480

Lys Ile Glu Asp Asp Glu Glu Glu Ala
485

<210> 17
<211> 1707
<212> DNA
<213> Skeletonema costatum

<400> 17
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gtcgaccccc tccaagatga caaagctact gaaatcaagc tgtgcaactt ctcccgccca 120
cacatgcgtg ccttccactg ctcatgggtc tgcttcttca ctgcgttctt catctgggtc 180
gccatcgctc ctctcatgcc cgagatcaag acgaccctcg gtcttaccaa acaacagatc 240
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 <212> PRT
 <213> Skeletonema costatum

<400> 18

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35 40 45

Trp Phe Cys Phe Phe Thr Ala Phe Phe Ile Trp Phe Ala Ile Ala Pro
50 55 60

Leu Met Pro Glu Ile Lys Thr Thr Leu Gly Leu Thr Lys Gln Gln Ile
65 70 75 80

Trp Thr Ser Asn Ile Cys Ser Val Ala Gly Thr Ile Phe Met Arg Phe
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Val Asn Gly Pro Ile Cys Asp Lys Tyr Gly Ala Arg Ile Pro Met Gly
100 105 110

Phe Ile Leu Val Gly Ala Ser Ile Pro Cys Ala Met Thr Gly Leu Val

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Leu	Gly	Gly	Gly	Val	Thr	Gln	Leu	Ile	Met	Gly	Ser	Val	Leu	Phe	Pro
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Leu	Phe	Lys	Leu	Gly	Met	Ser	Ala	Glu	Met	Ala	Trp	Arg	Thr	Val	Cys
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Gly	Thr	Met	Ala	Glu	Val	Ser	Ala	Ala	Ala	Ser	Phe	Arg	Ala	Gly	Ala
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Met	Asn	Phe	Asn	Thr	Trp	Leu	Leu	Phe	Val	Gln	Tyr	Ala	Cys	Cys	Phe
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Lys	Ala	Asn	Ala	Arg	Met	Gly	Met	Arg	Gly	Arg	Ile	Trp	Trp	Gln	Thr
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Asn	Ser	Leu	Gly	Ala	Ala	Ile	Val	Leu	Met	Val	Ile	Phe	Ser	Ser	Phe
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Val Gln Ala Ala Glu Gly Ser Ser Tyr Gly Ile Val Pro Tyr Ile Asn
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Pro Pro Ala Thr Gly Ser Ile Ala Gly Ile Val Gly Ala Gly Gly Asn
385 390 395 400

Thr Gly Ala Val Ala Phe Gly Leu Gly Phe Arg Gln Leu Pro Tyr Tyr
405 410 415

Asp Ala Phe Ile Leu Met Gly Ser Cys Ile Ile Ala Ser Gly Val Leu
420 425 430

Ser Leu Phe Ile Cys Ile Lys Gly His Ala Gly Leu Val Thr Gly Gln
435 440 445

Asp Ser Glu Glu Ala Ile Ala Ala Trp Lys Lys Leu Gly Ser Ala Pro
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Glu Ile Glu Glu Asp Lys Ala
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<213> Arabidopsis thaliana

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<212> PRT
<213> Arabidopsis thaliana

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Ser Asp Ser Ser Ala Lys Phe Ser Leu Pro Val Asp Thr Glu His Lys
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Ala Lys Val Phe Lys Leu Leu Ser Phe Glu Ala Pro His Met Arg Thr
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Phe His Leu Ala Trp Ile Ser Phe Phe Thr Cys Phe Ile Ser Thr Phe
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Arg Gln Asp Val Gly Asn Ala Gly Val Ala Ser Val Ser Gly Ser Ile
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Phe Ser Arg Leu Val Met Gly Ala Val Cys Asp Leu Leu Gly Pro Arg
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Tyr Gly Cys Ala Phe Leu Val Met Leu Ser Ala Pro Thr Val Phe Ser
130 135 140

Met Ser Phe Val Gly Gly Ala Gly Gly Tyr Ile Thr Val Arg Phe Met
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Ile Gly Phe Cys Leu Ala Thr Phe Val Ser Cys Gln Tyr Trp Met Ser
165 170 175

Thr Met Phe Asn Gly Gln Ile Ile Gly Leu Val Asn Gly Thr Ala Ala
180 185 190

Gly Trp Gly Asn Met Gly Gly Gly Val Thr Gln Leu Leu Met Pro Met
195 200 205

Val Tyr Glu Ile Ile Arg Arg Leu Gly Ser Thr Ser Phe Thr Ala Trp
210 215 220

Arg Met Ala Phe Phe Val Pro Gly Trp Met His Ile Ile Met Gly Ile
225 230 235 240

Leu Val Leu Thr Leu Gly Gln Asp Leu Pro Asp Gly Asn Arg Ser Thr
245 250 255

Leu Glu Lys Lys Gly Ala Val Thr Lys Asp Lys Phe Ser Lys Val Leu
260 265 270

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

Gly Tyr Ser Met Gly Val Glu Leu Thr Thr Asp Asn Val Ile Ala Glu
290 295 300

Tyr Phe Phe Asp Arg Phe His Leu Lys Leu His Thr Ala Gly Ile Ile
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Ala Ala Ser Phe Gly Met Ala Asn Phe Phe Ala Arg Pro Ile Gly Gly

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Pro	Phe	Ile	Ser	Arg	Arg	Ser	Leu	Gly	Ile	Ile	Ser	Gly	Leu	Thr	Gly
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Ile	Met	Ala	Cys	Thr	Leu	Pro	Val	Thr	Leu	Val	His	Phe	Pro	Gln	Trp
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Glu	Tyr	Tyr	Tyr	Met	Lys	Glu	Trp	Thr	Glu	Thr	Glu	Lys	Arg	Lys	Gly
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Met	His	Glu	Gly	Ser	Leu	Lys	Phe	Ala	Val	Asn	Ser	Arg	Ser	Glu	Arg
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 <212> DNA
 <213> Chlorella sorokiniana

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<212> PRT
<213> Chlorella sorokiniana

<400> 22

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Ser Val Pro Val Asp Ser Glu Asn Lys Ser Lys Val Leu Lys Ile Trp
35 40 45

Ser Phe Gln Arg Pro His His Leu Ser Phe His Leu Ser Trp Met Ser
50 55 60

Phe Met Leu Ala Phe Phe Ala Thr Phe Ala Ala Pro Pro Met Met Pro
65 70 75 80

Val Ile Arg Asn Asn Leu Asp Leu Thr Lys Pro Asp Ile Gly Gly Ala
85 90 95

Ser Ile Ala Ala Val Thr Gly Ala Val Phe Ser Arg Ile Leu Leu Gly
100 105 110

Ala Val Cys Asp Ser Tyr Gly Pro Arg Tyr Gly His Gly Val Leu Gln
115 120 125

Leu Leu Cys Ser Ala Ala Thr Phe Ala Met Ala Ser Ile Thr Asn Ala
130 135 140

Ala Gly Phe Ile Ile Cys Arg Met Val Ile Gly Phe Ser Leu Ala Thr
145 150 155 160

Phe Val Pro Cys Gln Phe Trp Cys Ser Val Met Phe Asn Ala Lys Ile
165 170 175

Val Gly Thr Ala Asn Ala Val Ala Ala Gly Trp Gly Asn Met Gly Ala
180 185 190

Gly Leu Thr His Leu Ile Met Pro Tyr Ile Phe Thr Gly Met Ala Ser
195 200 205

His Gln Pro Asp Phe Ile Ala Trp Arg Cys Ala Tyr Phe Val Pro Gly
210 215 220

Phe Ala His Ile Ile Ile Gly Leu Leu Val Leu Met Phe Gly Gln Asp
225 230 235 240

Leu Pro Asp Gly Asn Tyr Gly Ala Leu Arg Lys Ala Gly Lys Lys Asp
245 250 255

Lys Ala Lys Thr His Met Glu Leu Leu Val Ala Val Lys Asn Tyr Arg
260 265 270

Thr Trp Leu Leu Val Leu Asn Tyr Gly Tyr Cys Phe Gly Val Glu Leu
275 280 285

Thr Val Asp Asn Asn Ile Ser Pro Tyr Leu Tyr Asp Gln Phe Gly Ile
290 295 300

Asp Leu His Leu Ala Gly Val Leu Gly Ala Val Phe Gly Leu Ser Asn
305 310 315 320

Leu Phe Ala Arg Ala Leu Gly Gly Leu Ala Ser Asp Tyr Ala Ser Arg
325 330 335

Arg Phe Gly Met Arg Gly Arg Leu Trp Thr Leu Trp Ile Val Gln Ser
340 345 350

Leu Gly Gly Val Cys Ser Ile Leu Met Phe Tyr Thr Ser His Ser Leu
355 360 365

Gly Ala Thr Met Ala Ile Val Val Cys Trp Ser Ile Phe Val Pro Met
370 375 380

Gly Cys Gly Ala Thr Tyr Gly Ile Ala Pro Phe Ile Thr Arg Arg Gly
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Leu Gly Val Ala Thr Gly Leu Ile Gly Ala Gly Gly Asn Thr Gly Ser
405 410 415

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

Phe Ala Gly Arg Pro Ala Thr Pro Cys Ser Tyr Leu Val Ser Ser Ser
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Pro
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tcgattgaac	cggtggaaac	gacaagtgtc	cttgatcgtg	gcacacgccc	tgaggcgga	1920
cacgtttcgg	acgtgcatcc	agctcagaag	ccgtaggcat	ccgagataga	gcttcgtgaa	1980
tgagtctacg	tggcacatgt	ggatgtgcag	gatatatgca	tgcgggtggta	cggctaactt	2040

<210> 24
 <211> 568

<212> PRT

<213> Cyanidioschyzon merolae

<400> 24

Met Ala Glu Gly Ala Gly Gln Pro Val Pro Thr Ala Leu Asp Glu Lys
1 5 10 15

Glu Ile Leu Leu Arg Asp Asp Thr Leu Asp Ser Ser Leu Gly Pro Ser
20 25 30

Arg Pro Asn Ser Lys Glu Trp Lys Asp Leu Glu Val Glu Ser Val Ala
35 40 45

Ala Pro Leu Tyr Ser Tyr Arg Leu Pro Val Asp Ala Leu His Arg Ala
50 55 60

Arg Arg Leu Glu Pro Trp Arg Phe Asp Arg Pro His Met Arg Ala Phe
65 70 75 80

Phe Phe Ala Trp Ser Ser Phe Phe Ile Ala Phe Phe Gly Trp Phe Ala
85 90 95

Val Pro Ala Leu Leu Pro Ser Ile Ser Ser Asp Lys Ala Leu Asp Leu
100 105 110

Thr Lys Ala Asn Lys Ala His Ser Asn Ala Ile Ala Leu Ser Gly Thr
115 120 125

Val Phe Met Arg Met Val Thr Gly Ala Leu Val Asp Arg Phe Gly Pro
130 135 140

Arg Arg Val Gln Ala Leu Leu Leu Ala Val Phe Ser Ile Pro Val Tyr
145 150 155 160

Leu Phe Gly Thr Val Tyr Asn Phe Ala Ser Phe Ala Thr Ala Arg Phe
165 170 175

Phe Ile Gly Gly Leu Gly Ala Thr Phe Val Val Thr Glu Tyr Trp Cys
180 185 190

Ala Leu Met Phe Ser Arg Asn Ile Ile Gly Thr Ala Asn Ala Val Ala
195 200 205

Ala Gly Trp Gly Asn Ala Gly Gly Gly Ala Thr Asn Ala Leu Met Pro
210 215 220

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

Trp Arg Val Val Met Val Ile Pro Gly Thr Met Ala Leu Ile Trp Ala
245 250 255

Val Val Leu Phe Phe Phe Ser Asp Asp Cys Pro Asp Gly Asp Tyr Lys
260 265 270

Asn Leu Tyr Arg Ile Gly Asn Leu Arg Pro Ile Ser Ala Leu Glu Ala
275 280 285

Phe Ala Arg Ala Ala Arg Asn Pro Arg Thr Tyr Val Leu Phe Cys Leu
290 295 300

Tyr Ala Ser Ser Phe Gly Val Glu Leu Thr Met Asp Asn Val Leu Ala
305 310 315 320

Thr Tyr Phe Asn Lys Val Phe Asn Leu Asp Gln Ser Ile Ala Gly Val
325 330 335

Ala Ala Gly Leu Phe Gly Leu Met Asn Leu Phe Ala Arg Ala Val Gly
340 345 350

Gly Ile Gly Ser Asp Leu Ile Ala Arg Arg Tyr Ser Met Arg Gly Arg
355 360 365

Val Leu Trp Leu Phe Ala Asn Leu Val Leu Glu Gly Val Phe Cys Leu
370 375 380

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

Leu Phe Ser Leu Phe Thr Gln Ala Ser Cys Gly Ala Val Phe Ala Ile
405 410 415

Val Pro Phe Val Asp Pro Ile Ala Thr Gly Ser Val Gly Gly Ile Val
420 425 430

Gly Ala Gly Gly Asn Thr Gly Gly Val Thr Leu Ser Leu Val Phe Ser
435 440 445

His Met Ser Asp Pro Asp Ala Val Arg Leu Ile Ser Phe Val Val Leu
450 455 460

Gly Ile Ser Val Leu Ser Phe Leu Leu Leu Trp Pro Leu Pro Val Lys

465		470		475		480
Val Thr Thr Ile Gly Ile Ser Asp Ala Glu Leu Arg Ala Leu Asn Arg						
	485			490		495
Leu Ser Leu Gln Lys Asp Asp Leu Gly Val Ser Glu Gln Pro Pro Asp						
	500			505		510
Asp Lys Ala Met Ser Pro Ile Val Ala Ile Gly Glu Pro Met Asn Thr						
	515			520		525
Gly Ala Leu Gln Ser Val Met Arg Asp Ser Ile Glu Pro Val Glu Thr						
	530			535		540
Thr Ser Ala Leu Asp Arg Gly Thr Arg Pro Glu Ala Glu His Val Ser						
545		550		555		560
Asp Val His Pro Ala Gln Lys Pro						
	565					

<210> 25
 <211> 1709
 <212> DNA
 <213> *Ostreococcus lucimarinus*

<400> 25	
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gtcgaatcga gcgcgtgtgc ggtcgcgcgc gatggcgacg cggcgctcga acgcgtcgat	180
aacgatgaaa gatataattt tttatgcttt catgcccgcg agactgacgt gtaacgcgcg	240
gtgccgtcgt acgtggccac agcgagcaca aggcgatgaa gctgaacgtc ttcagctttg	300
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gtttgggcat cggctctgggt ctcgccacgt tcgtggcgtg ccagttctgg atgtcttgca	660
tgttcaacag caagtgcgtc ggtctcgcca acgcgaccgc cgcgggctgg ggtaacttgg	720
gcggcgaggt cagcaattc ttgatgccgg gcactctacg catctgctac tcggcgacca	780
acagccgtgc gttcactgcc tggcgttggg cgtacatctt cccgggcatg tgccacaccg	840

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<210> 26
<211> 477
<212> PRT
<213> Ostreococcus lucimarinus

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```
<400> 26
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Met Lys Leu Asn Val Phe Ser Phe Asp Arg Pro His His Leu Ser Phe
1           5           10           15

```

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His Met Ser Trp Leu Gly Phe Phe Ile Ser Phe Val Ser Thr Phe Ala
          20           25           30

```

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Ala Ala Pro Met Ile Pro Val Ile Arg Glu Asp Leu Gly Leu Thr Lys
          35           40           45

```

```

Pro Gln Leu Gly Asn Ala Gly Leu Ala Ala Val Thr Gly Thr Ile Ile
          50           55           60

```

```

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

```

```

Gly Leu Ser Val Ile Leu Leu Ala Thr Ala Pro Phe Cys Phe Ala Met
          85           90           95

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Ala Met Val Gln Gly Phe Glu Gly Phe Leu Ile Cys Arg Leu Gly Ile
100 105 110

Gly Leu Gly Leu Ala Thr Phe Val Ala Cys Gln Phe Trp Met Ser Cys
115 120 125

Met Phe Asn Ser Lys Cys Val Gly Leu Ala Asn Ala Thr Ala Ala Gly
130 135 140

Trp Gly Asn Leu Gly Gly Gly Val Thr Gln Phe Leu Met Pro Gly Ile
145 150 155 160

Tyr Ala Ile Cys Tyr Ser Ala Thr Asn Ser Arg Ala Phe Thr Ala Trp
165 170 175

Arg Trp Ala Tyr Ile Phe Pro Gly Met Cys His Thr Val Val Gly Leu
180 185 190

Met Val Met Tyr Leu Gly Gln Asp Leu Pro Asp Gly Asn Tyr Lys Val
195 200 205

Leu Thr Thr Ser Gly Ala Leu Glu Lys Lys Ser Ser Met Lys Val Asn
210 215 220

Leu Ile Gly Met Lys Asn Tyr Arg Met Trp Cys Met Val Ala Thr Tyr
225 230 235 240

Gly Phe Cys Phe Gly Val Glu Leu Thr Met Asn Asn Ile Val Ala Gly
245 250 255

Tyr Leu Phe Asp Gln Phe Gly Val Ser Leu Ser Val Ala Gly Val Leu
260 265 270

Ala Ser Cys Tyr Gly Met Met Asn Leu Phe Ala Arg Ser Val Gly Gly
275 280 285

Ile Ile Ser Asp Trp Ser Ser Asn Arg Phe Gly Met Arg Gly Arg Leu
290 295 300

Trp Thr Leu Trp Ser Thr Gln Thr Leu Glu Gly Val Leu Cys Ile Phe
305 310 315 320

Met Gly Leu Ser Lys Asp Asn Leu Gly Ala Thr Ile Ala Phe Met Val
325 330 335

Phe Phe Ser Ile Cys Val Gln Ala Ser Glu Gly Ala Ser Tyr Gly Ile
340 345 350

Val Pro Phe Ile Ser Arg Arg Ala Leu Gly Val Val Ser Gly Phe Ile
355 360 365

Gly Ala Gly Gly Asn Ala Gly Ala Thr Ile Ala Thr Ala Ala Phe Phe
370 375 380

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

Thr Val Ile Gly Val Thr Ala Leu Val Ile Pro Ile His Phe Pro Met
405 410 415

Trp Gly Ser Met Phe Phe Pro Ala Ser Lys Thr Ala Thr Glu Glu Asp
420 425 430

Tyr Tyr Ile His Asn Glu Phe Thr Pro Glu Glu Ile Lys Ala Gly Leu
435 440 445

Ala Ala Pro Val Gln Lys Phe Cys Asn Asn Ser Arg Asn Glu Arg Pro
450 455 460

Val Trp Lys Arg Glu Gln Asp Ala Val Glu Ala Ser Ala
465 470 475

<210> 27
<211> 2693
<212> DNA
<213> Physcomitrella patens

<400> 27
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acgtcgatcg attgatcgat cggcgtccta gtcagaaggt gttgggtcag tttgagagag 180
ttaacaactt acattgtgtg tgtagataga tcttgatagg cttggagggt taggttgggg 240
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taagggtgat cccggatcgt ccatgcatgg cgtcacggga aaggaggcct tgtatgcatt 360
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 cgagctttca attctacgtt tcttttgtaa tggaactggg ttttgtcaca tca 2693

<210> 28
 <211> 547
 <212> PRT
 <213> *Physcomitrella patens*

<400> 28

Met Ala Asp Leu Ser Ser Ser Ala Val Gly Asp Arg Asn Ala Lys Gly
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Asp Pro Gly Ser Ser Met His Gly Val Thr Gly Lys Glu Ala Leu Tyr
 20 25 30

Ala Phe Ser Leu His Asp Gly Asp Lys Met Asn Tyr Asp Pro Asp Ala
 35 40 45

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

Ile His Ser Phe Ser Arg Pro His Met Leu Thr Phe His Leu Ser Trp
 65 70 75 80

Phe Ser Phe Phe Thr Cys Phe Met Ser Thr Phe Ala Ala Pro Pro Leu
 85 90 95

Ile Pro Val Ile Arg Asp Asn Leu Asn Leu Asn Lys Glu Asp Ile Gly
 100 105 110

His Ala Ala Ile Ala Ser Val Thr Gly Ser Ile Leu Ser Arg Leu Leu
 115 120 125

Met Gly Ser Leu Cys Asp Met Ile Gly Pro Arg Tyr Gly Cys Ala Phe
 130 135 140

Leu Val Met Ile Ile Ser Pro Ala Val Tyr Ala Met Ala Val Val Asp
 145 150 155 160

Ser Ala Ala Gly Phe Thr Ala Val Arg Phe Phe Val Gly Phe Ser Leu
 165 170 175

Ala Thr Phe Val Ser Cys Gln Tyr Trp Met Ser Ser Met Phe Asn Gly
180 185 190

Lys Ile Val Gly Thr Ala Asn Gly Ile Ala Ala Gly Trp Gly Asn Leu
195 200 205

Gly Gly Gly Ala Thr Gln Met Ile Met Pro Leu Val Tyr Ala Leu Ile
210 215 220

Lys Asp Ser Phe His Ser Pro Ser Tyr Thr Ala Trp Arg Leu Ala Phe
225 230 235 240

Phe Leu Pro Gly Val Met His Thr Val Ile Gly Leu Leu Val Leu Phe
245 250 255

Leu Gly Gln Asp Leu Pro Asp Gly Asn Phe Lys Glu Leu Gln Glu Gln
260 265 270

Gly Thr Lys Pro Lys Asp Ser Phe Lys Lys Val Phe Ile Asn Ala Ile
275 280 285

Thr Asn Tyr Arg Thr Trp Ile Phe Leu Ile Thr Tyr Gly Tyr Cys Phe
290 295 300

Gly Val Glu Leu Thr Val Asp Asn Ile Ile Ala Glu Tyr Phe Tyr Asp
305 310 315 320

Arg Phe Gly Leu Ser Leu Ser Thr Ala Gly Ile Ile Ala Ser Ser Phe
325 330 335

Gly Leu Met Asn Ile Phe Ser Arg Pro Leu Gly Gly Ile Leu Ser Asp
340 345 350

Val Val Ala Arg Arg Tyr Gly Met Gln Gly Arg Leu Trp Asn Leu Trp
355 360 365

Ile Ile Gln Thr Leu Gly Gly Val Phe Cys Ile Val Leu Gly Lys Thr
370 375 380

Ala Ala Leu Gly Pro Ala Ile Gly Val Met Ile Val Phe Ser Phe Phe
385 390 395 400

Val Gln Ala Ala Cys Gly Ala Thr Phe Gly Val Ile Pro Phe Val Ser
405 410 415

Arg Arg Ser Leu Gly Val Ile Ser Gly Phe Thr Gly Ala Gly Gly Asn
 420 425 430

Val Gly Ala Val Leu Thr Gln Thr Ile Phe Phe Thr Gln Ala Thr Tyr
 435 440 445

His Thr Glu Val Gly Ile Glu Asn Met Gly Ile Met Ile Ile Cys Cys
 450 455 460

Thr Ala Leu Val Leu Phe Val Trp Phe Pro Gln Trp Gly Ser Met Phe
 465 470 475 480

Phe Lys Ser Ser Arg Met Thr Glu Glu Asp Tyr Tyr Ala Ser Glu Tyr
 485 490 495

Ser Glu Gly Glu Gln Asp Gln Gly Leu His Gln Ala Ser Leu Lys Phe
 500 505 510

Ala Glu Asn Ala Lys Ser Glu Arg Gly Arg Ser Lys Gly Ser Lys Ser
 515 520 525

Pro Pro Glu Asn Gly Lys Pro Asp Gly Leu Lys Gly Ile Lys Glu Gly
 530 535 540

Ala Glu Val
 545

<210> 29
 <211> 1885
 <212> DNA
 <213> Prunus persica

<400> 29
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atttcagaaa aaaaaaaaaa aaaaa 1885

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<210> 30
<211> 530
<212> PRT
<213> Prunus persica

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<400> 30

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Met Ala Glu Val Glu Gly Glu Pro Gly Ser Ser Met His Gly Val Thr
1           5           10          15

```

```

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

```

Thr Asp Pro Thr Ala Lys Phe Asp Leu Pro Val Asp Ser Glu His Lys
 35 40 45

Ala Lys Val Phe Lys Ile Phe Ser Leu Ala Asn Pro His Met Arg Thr
 50 55 60

Phe His Leu Ser Trp Ile Ser Phe Phe Thr Cys Phe Val Ser Thr Phe
 65 70 75 80

Ala Ala Ala Pro Leu Val Pro Ile Ile Arg Asp Asn Leu Asn Leu Thr
 85 90 95

Lys Gln Asp Ile Gly Asn Ala Gly Val Ala Ser Val Ser Gly Ser Ile
 100 105 110

Phe Ser Arg Leu Val Met Gly Ala Val Cys Asp Leu Leu Gly Pro Arg
 115 120 125

Tyr Gly Cys Ala Phe Leu Ile Met Leu Ser Ala Pro Thr Val Phe Cys
 130 135 140

Met Ser Phe Val Ser Asp Ala Gly Gly Tyr Leu Ala Val Arg Phe Met
 145 150 155 160

Ile Gly Phe Ser Leu Ala Thr Phe Val Ser Cys Gln Tyr Trp Met Ser
 165 170 175

Thr Met Phe Asn Ser Lys Ile Ile Gly Leu Val Asn Gly Thr Ala Ala
 180 185 190

Gly Trp Gly Asn Met Gly Gly Gly Ala Thr Gln Leu Leu Met Pro Leu
 195 200 205

Val Phe Asp Ile Ile Gly Arg Val Gly Ala Thr Pro Phe Thr Ala Trp
 210 215 220

Arg Ile Ala Phe Phe Ile Pro Gly Trp Leu His Val Ile Met Gly Ile
 225 230 235 240

Met Val Leu Thr Leu Gly Gln Asp Leu Pro Asp Gly Asn Leu Ala Ala
 245 250 255

Leu Gln Lys Lys Gly Asp Val Ala Lys Asp Gln Phe Ser Lys Val Leu
 260 265 270

Trp His Ala Val Thr Asn Tyr Arg Thr Trp Ile Phe Val Leu Leu Tyr

275						280						285					
Gly	Tyr	Ser	Met	Gly	Val	Glu	Leu	Ser	Thr	Asp	Asn	Val	Ile	Ala	Glu		
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Ala	Ala	Thr	Phe	Gly	Met	Ala	Asn	Leu	Val	Ala	Arg	Pro	Phe	Gly	Gly		
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			340					345					350				
Trp	Thr	Leu	Trp	Ile	Leu	Gln	Thr	Leu	Gly	Gly	Val	Phe	Cys	Ile	Trp		
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Leu	Gly	Arg	Ala	Asn	Ser	Leu	Pro	Ile	Ala	Val	Phe	Ala	Met	Ile	Leu		
	370					375					380						
Phe	Ser	Val	Gly	Ala	Gln	Ala	Ala	Cys	Gly	Ala	Thr	Phe	Gly	Val	Ile		
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			420					425					430				
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Ile	Val	Cys	Cys	Thr	Leu	Pro	Val	Thr	Leu	Val	His	Phe	Pro	Gln	Trp		
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Glu	Phe	Tyr	Tyr	Gly	Ala	Glu	Trp	Asn	Glu	Glu	Glu	Lys	Gln	Lys	Gly		
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His Val
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