

eolf-seq1.txt
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<120> Desaturasen und Verfahren zur Herstellung von mehrfach ungesättigten Fettsäuren in transgenen Organismen

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<150> EP 07113506.5
<151> 2007-07-31

<150> EP 07123864.6
<151> 2007-12-20

<150> EP 08103294.8
<151> 2008-04-01

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eof-seq1.txt

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Asp Tyr Gln Gln Lys Pro Ala Ser Ser Lys Leu Ile Asp Thr Tyr Gly
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Asn Glu Phe Lys Met Pro Asp Tyr Thr Ile Lys Asp Ile Arg Asp Ala
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Ile Pro Lys His Cys Phe Glu Arg Ser Ala Ala Thr Gly Leu Tyr Tyr
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eo1f-seq1.txt

Val Ala Arg Asp Ile Val Leu Leu Ser Thr Thr Phe Phe Leu Phe Asn
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 Leu Trp Ala Ala Tyr Thr Phe Ile Gln Gly Leu Phe Gly Thr Gly Leu
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 Trp Val Leu Ala His Glu Cys Gly His Gln Ser Phe Ser Pro Ser Lys
 145 150 155 160
 Thr Leu Asn Asp Thr Val Gly Trp Ile Cys His Ser Ala Leu Leu Val
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 Pro Tyr Phe Ser Trp Lys Ile Ser His Gly Lys His His Lys Ala Thr
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 Gly Asn Met Glu Arg Asp Met Val Phe Leu Pro Arg Thr Arg Asp Glu
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 Glu Glu Thr Pro Ile Tyr Thr Ala Val Ser Met Ile Val Gln Gln Leu
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 Gly Gly Trp Pro Met Tyr Leu Ile Gln Asn Leu Thr Gly His Asn Asn
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 His Glu Lys Gln Pro Glu Gly Lys Gly Val Gly Lys Lys Asn Gly Asn
 260 265 270
 Gly Ser Val Asn His Phe Leu Pro Ser Ser Pro Leu Tyr Glu Lys Lys
 275 280 285
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 Ser Val Leu Thr Tyr Val Gly Lys Thr Tyr Gly Phe Thr Asn Leu Leu
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eof-seq1.txt

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Ala Thr Glu Ala Ile Lys Pro Ile Met Gly Gln His Tyr Arg Ala Asp
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Val Glu Gly Gly Ser Ile Gly Phe Leu Lys Ala Met Trp Lys Ser Ala
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Arg Trp Cys Gln Trp Val Glu Pro Leu Pro Gly Thr Thr Gly Glu Glu
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Ser Lys Val Leu Phe Phe Arg Asn Arg Asn Gly Leu Gly Val Pro Pro
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Ala Lys Leu Ser Pro Lys Ala Gly Lys Arg Ala Met Val Glu Asp Asp
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<210> 19
<211> 1906
<212> DNA
<213> Naegleria gruberi

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eolf-seq1.txt

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 <213> Naegleria gruberi

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eof-seq1.txt

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<210> 21
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<213> Naegleria gruberi

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<400> 21

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

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195

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205

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

His Val Phe Ser Lys Ile Pro Phe Tyr His Ala Glu Glu Ala Thr Lys
 340 345 350

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

Ser Phe Phe Gly Ala Leu Phe Glu Asn Leu Lys Asn Cys Val Ala Leu
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<211> 1740

<212> DNA

<213> Phycomyces blakesleeianus

<400> 22

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eolf-seq1.txt

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 <212> DNA
 <213> *Phycomyces blakesleeanus*

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Lys Glu Ile Arg Asp Ala Ile Pro Ser His Cys Phe Arg Ile Asp Thr
35 40 45

Phe Arg Ser Phe Gly Tyr Val Leu His Asp Phe Phe Phe Val Ala Leu
50 55 60

Leu Met Tyr Gly Ala Ser Lys Ile Asp Thr Leu Ser Ser Pro Tyr Ile
65 70 75 80

Arg Phe Val Leu Trp Ala Thr Tyr Ser Val Leu Gln Gly Ile Val Gly
85 90 95

Thr Gly Leu Trp Val Ile Gly His Glu Cys Gly His Gln Ala Phe Ser
100 105 110

Pro Ser Lys Thr Ile Asn Asn Ser Val Gly Ile Ile Ile His Ser Leu
115 120 125

Leu Leu Val Pro Tyr Tyr Ser Trp Lys Ile Ser His Ser Lys His His
130 135 140

Lys Ser Asn Gly His Leu Tyr Asn Asp Met Val Tyr Val Pro Arg Thr
Page 27

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Val Thr Gly Lys Arg Pro Lys215 Lys Thr Trp Thr Ser220 His Phe Asn Phe
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Ile Tyr Gly Ser260 Met Thr Val Met Lys265 Tyr Tyr Val Phe Pro270 Tyr Leu
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His His His Ile Ser325 Asp Thr His Val Ala330 His His Phe Phe Ser335 Asn
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eof-seq1.txt

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 35 40 45

Phe Trp Asp Ile Phe Val Ile Gly Cys Ile Tyr Lys Thr Ala Ser Tyr
 50 55 60

Leu Asp Thr Phe Ile Asn Pro Ala Thr Ile Ser Leu Pro His Pro Tyr
 65 70 75 80

Leu Tyr Pro Phe Ala Arg Phe Ala Leu Trp Ser Leu Tyr Gly Phe Trp
 85 90 95

Val Gly Leu Phe Ala Thr Gly Leu Trp Val Val Ala His Glu Cys Gly
 100 105 110

His Gln Ala Phe Ser Glu Ser Lys Thr Ile Asn Asn Thr Val Gly Trp
 115 120 125

eo1f-seq1.txt

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

Phe Val Pro Ser Thr Arg Ser Asp Val Gly Leu Pro Ser Leu Asn Val
165 170 175

Ala Lys Glu Asp Arg Leu Gly Ser Arg Val Ser Glu Glu Val Lys Arg
180 185 190

Glu Phe Lys Glu Ala Leu Gly Asp Ser Pro Ile Gly Ala Ile Ile Gly
195 200 205

Ser Ala Thr Tyr Leu Leu Gly Gly Trp Pro Ala Tyr Ile Leu Thr Asn
210 215 220

Ala Ser Gly Gln Arg Arg Tyr Pro Lys Gly Thr Ser His Phe Asn Pro
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Lys Ala Val Met Phe Ser Pro His His Tyr Ser Gln Ile Ile Val Ser
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Asn Ile Gly Val Ala Leu Trp Leu Gly Ile Ile Gly Thr Trp Ile Tyr
260 265 270

Tyr Lys Gly Phe Ser Glu Val Phe Arg Leu Tyr Leu Val Pro Tyr Leu
275 280 285

Trp Ala Asn His Trp Leu Val Leu Ile Thr Phe Leu Gln His Thr Asp
290 295 300

Pro Leu Leu Pro His Tyr Arg Ala Pro Glu Phe Thr Phe Pro Arg Gly
305 310 315 320

Ala Leu Ala Thr Leu Asp Arg Ser Leu Leu Gly Asp Cys Gly Ser Ile
325 330 335

Met Ala Trp Met Gly Ala His Ala Thr His Gly Ile Ser Glu Thr His
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Ile Leu His His Val Ser Ser Lys Ile Pro His Tyr Asn Ala Trp Glu
355 360 365

Ala Ser Ala Ala Leu Lys Lys Lys Leu Ala Ser Ala Gly Ile Pro Met
370 375 380

Gln Gly Gly Pro Gly Gly Trp Arg Glu Val Tyr Arg Val Tyr Arg Glu
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eof-seq1.txt

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<220>
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 <223> Xaa in position 2 is Tyr or Phe

<220>
 <221> Variant
 <222> (6)..(6)
 <223> Xaa in position 6 is Thr or Ser

<220>
 <221> Variant
 <222> (7)..(7)
 <223> Xaa in position 7 is Asp or His

<400> 115

Thr Xaa Leu Gln His Xaa Xaa
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<210> 116
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<213> Artificial

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<222> (6)..(6)

<223> Xaa can be any naturally occurring amino acid

<220>

<221> Variant

<222> (7)..(7)

<223> Xaa in position 7 is Gly or no amino acid

<220>

<221> Variant

<222> (8)..(8)

<223> Xaa in position 8 can be any naturally occurring amino acid or no amino acid

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<222> (9)..(9)

<223> Xaa can be any naturally occurring amino acid

<400> 116

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<223> Desaturase motif 8

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<221> Variant

<222> (3)..(3)

<223> Xaa in position 3 is Leu or Met

<220>

<221> Variant

<222> (6)..(6)

<223> Xaa in position 6 is His or Thr or Ser or Val

<220>

<221> Variant

<222> (7)..(7)

<223> Xaa in position 7 is Gly or no amino acid

<220>

<221> Variant

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<222> (8)..(8)
 <223> Xaa in position 8 is His or Tyr or no amino acid

<220>
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 <222> (9)..(9)
 <223> Xaa in position 9 is His or Asp or Glu or Gly

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<220>
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 <222> (3)..(3)
 <223> Xaa in position 3 is Leu or Met

<220>
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 <222> (6)..(6)
 <223> Xaa in position 6 is His or Thr or Ser

<220>
 <221> Variant
 <222> (7)..(7)
 <223> Xaa in position 7 is His or Asp or Glu

<400> 118

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<210> 119
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<220>

<221> Variant
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 <223> Xaa in position 9 is His or Asp or Glu or Gly

<400> 119

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<210> 121
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<220>
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 <223> Xaa in position 3 is Leu or Met

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<400> 121

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<210> 122

<211> 1975

<212> DNA

<213> Helobdella robusta

<400> 122

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attaattttg aaacaatcct ataaaaatct gcaaacttac ccaagccctc tgttaaataga	180
tgttcccact gagcgatcta atgaactgtg taactgaggt taactccata atagcaagcc	240
taataaaagc agcggttcctg tattcaaacc cgcaaactaa aatccgagga ataaacctgg	300
acaccaact accaaaaaat ctgccatcag tcattgagat caagcgagtg ataccaagcc	360
actgttttgt gccgagcacc tgccgatctc ttttgtacgc cctgaaggat gtggtgcaga	420
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tagggacat cagccacgct ttcctgttcg tcccttacta ccagtggag ctcacccatc	660
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cgaagggcca gccatttcaa tttgtttgac gagatgttca ggggccacga agttgcttgc	1080
accctctcgt tgctactta cgggatgaac gggactctct gctactgggt ttatttgagt	1140
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cgccacgaaa ccacaaaaa tccaccacc acaaaattaa aaaaaaatc ttgcccagct	1500
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caatccactg cataggcacc caccaaatgc accacatggt caccaaaata cccactacc	1620
acctcgagga ggccaccaga catttttagga gtgctttccc ggagttagtg aaatcctgcg	1680
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eof-seq1.txt

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tattttattta ttactattat tattattatc gttattatta ctattattat taatactatc 1860
attattgtta ttattattat ttttttaata attttggctg cgggcattta cgattacaga 1920
aagctttaca tcttcttttc agacttattg tgatatataa atgaaattat tactt 1975
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<210> 123
<211> 1128
<212> DNA
<213> Helobdella robusta
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gttgcttgca ccctctcgtt gctcacttac gggatgaacg ggactctctg ctactggttt 720
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gctgatcaaa actggaacta cgtaaaaggt caactctcaa ccattgaccg taactacggg 900
ctggtccacc acgcaatcca ctgcataggc acccaccaaa tgcaccacat gttcaccaaa 960
atacccact accacctcga ggaggccacc agacatttta ggagtgcctt cccggagtta 1020
gtgaaatcct gcgacgagcc catactttcg tcattcgtac gcatgttcaa gaagtacaat 1080
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<210> 124
<211> 375
<212> PRT
<213> Helobdella robusta
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Ala Ala Phe Leu Tyr Ser Asn Pro Gln Thr Lys Ile Arg Gly Ile Asn
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eof-seq1.txt

Leu Asp Thr Gln Leu Pro Lys Asn Leu Pro Ser Val Ile Glu Ile Lys
 35 40 45
 Arg Val Ile Pro Ser His Cys Phe Val Pro Ser Thr Cys Arg Ser Leu
 50 55 60
 Leu Tyr Ala Leu Lys Asp Val Val Gln Ile Leu Phe Ala Trp Val Leu
 65 70 75 80
 Leu Trp Tyr Leu Leu Pro Leu Thr Asn Trp Ile Ala Leu Lys Val Leu
 85 90 95
 Met Ile Phe Val Tyr Trp Gly Ile Gln Gly Thr Phe Phe Met Gly Leu
 100 105 110
 Phe Val Met Gly His Asp Cys Gly His Gly Ser Phe Ser Lys Tyr Arg
 115 120 125
 Leu Leu Asn Asp Val Val Gly Thr Ile Ser His Ala Phe Leu Phe Val
 130 135 140
 Pro Tyr Tyr Gln Trp Lys Leu Thr His Gln Asn His His Lys Phe Thr
 145 150 155 160
 Gly Asn Met Asp Lys Asp Glu Val Phe Tyr Pro Ala Arg Ala Ser Gln
 165 170 175
 Lys Pro Ser Ile Asn Ser Val Leu Pro Gly Phe Gly Tyr Gly Ile Gly
 180 185 190
 Trp Phe Thr Tyr Leu Phe Ile Gly Tyr Phe Pro Arg Arg Val Ser His
 195 200 205
 Phe Asn Leu Phe Asp Glu Met Phe Arg Gly His Glu Val Ala Cys Thr
 210 215 220
 Leu Ser Leu Leu Thr Tyr Gly Met Asn Gly Thr Leu Cys Tyr Trp Phe
 225 230 235 240
 Tyr Leu Ser Tyr Gly Phe Lys Ile Leu Phe Val Phe Tyr Leu Ala Pro
 245 250 255
 Leu Phe Ile Tyr Gly Ser Tyr Met Val Ile Val Thr Phe Leu His His
 260 265 270
 Ser Glu Val Asn Ile Pro Trp Tyr Ala Asp Gln Asn Trp Asn Tyr Val
 275 280 285
 Lys Gly Gln Leu Ser Thr Ile Asp Arg Asn Tyr Gly Leu Val His His
 290 295 300

eof-seq1.txt

Ala Ile His Cys Ile Gly Thr His Gln Met His His Met Phe Thr Lys
305 310 315 320

Ile Pro His Tyr His Leu Glu Glu Ala Thr Arg His Phe Arg Ser Ala
325 330 335

Phe Pro Glu Leu Val Lys Ser Cys Asp Glu Pro Ile Leu Ser Ser Phe
340 345 350

Val Arg Met Phe Lys Lys Tyr Asn Gln Gln Gln Val Val Ala Asp Asn
355 360 365

Ala Leu Glu Val Tyr Tyr Lys
370 375

<210> 125
<211> 1390
<212> DNA
<213> Lottia gigantea

<400> 125
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ccaaaacaga ggaacaagaa aatacagtca cggctgtttc acaagagact gatgagttat 180
ccaagacca tctgccaaat gaacttccaa ccataataga cattaaaaga gcaattccta 240
gtcactgctt tcagtccaat gttatcacct caatgtacca tgcgatgaag gacgtcgtat 300
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gatatcttgt tttcggtat aaccacgac cagttagaca tttcaatcct ttcgagaaaa 720
tcttttccaa acatgtcctc ggatgcatcc tatctctagt gacccttacg gtttggagtt 780
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cagcatttcc agaactagtc aatatccgca cggatcgaac atttccagcg ttctaccgaa 1140
tgttcaagaa atacgtcaaa cagtgtgtca ttccggacaa tactcatgta catatttata 1200
cataatttta tcaaagtgtc cacctactgc caaatgtatt ggatgtaaaa tttaagtaga 1260
gctatttgca atcgtgtaac atttttcgta aaattgggtg atcatacgaa gctgcatatc 1320

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 caaatcacat 1390

<210> 126
 <211> 1101
 <212> DNA
 <213> Lottia gigantea

<400> 126
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 aaaagagcaa ttcctagtca ctgctttcag tccaatgtta tcacctcaat gtaccatgcg 180
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 cttcctttct gggcagttct agtcacagca ccagtgtttt ggtttgctca gggaacaatg 300
 tttacagcac tattcgtgat tggatcatgat tgcggacatg gttcgttctc gaaatacgat 360
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 tggaaggtgt ccataagaa ccaccacaaa aacactggaa acattgacaa agatgaggtt 480
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 aatcctttcg agaaaatctt ttccaaacat gtcctcgat gcacccatc tctagtacc 660
 cttacggttt ggagttccta cgtgtaccag tattacatga tctttgggtt cttccgatta 720
 ttctaccatt atattgtgcc tttattcatc tttgctacca acactgttct tataacattt 780
 ctgcaccaca ccgaagagga aattccttgg tactccgata gcaagtggga caacgttcgt 840
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 accacccatc agatacatca cttattccca aaggttcctc attaccatct tgaagaagca 960
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<210> 127
 <211> 366
 <212> PRT
 <213> Lottia gigantea

<400> 127
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 Glu Leu Pro Thr Ile Ile Asp Ile Lys Arg Ala Ile Pro Ser His Cys
 35 40 45

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Phe Gln Ser Asn Val Ile Thr Ser Met Tyr His Ala Met Lys Asp Val
 50 55 60
 Val Phe Val Ile Gly Leu Tyr Ile Leu Gly Glu Leu Leu Leu Thr Tyr
 65 70 75 80
 Leu Pro Phe Trp Ala Val Leu Val Thr Ala Pro Val Phe Trp Phe Ala
 85 90 95
 Gln Gly Thr Met Phe Thr Ala Leu Phe Val Ile Gly His Asp Cys Gly
 100 105 110
 His Gly Ser Phe Ser Lys Tyr Asp Leu Leu Asn Asp Thr Val Gly Thr
 115 120 125
 Val Met His Ser Phe Leu Met Thr Pro Tyr Tyr Gly Trp Lys Val Ser
 130 135 140
 His Lys Asn His His Lys Asn Thr Gly Asn Ile Asp Lys Asp Glu Val
 145 150 155 160
 Phe Tyr Pro Val Arg Lys Ser Leu Lys Thr Pro Gly Arg Ala Leu Pro
 165 170 175
 Gly Phe Gly Leu Gly Leu Gly Tyr Phe Gly Tyr Leu Val Phe Gly Tyr
 180 185 190
 Asn Pro Arg Pro Val Arg His Phe Asn Pro Phe Glu Lys Ile Phe Ser
 195 200 205
 Lys His Val Leu Gly Cys Ile Leu Ser Leu Val Thr Leu Thr Val Trp
 210 215 220
 Ser Ser Tyr Val Tyr Gln Tyr Tyr Met Ile Phe Gly Phe Phe Arg Leu
 225 230 235 240
 Phe Tyr His Tyr Ile Val Pro Leu Phe Ile Phe Ala Thr Asn Thr Val
 245 250 255
 Leu Ile Thr Phe Leu His His Thr Glu Glu Glu Ile Pro Trp Tyr Ser
 260 265 270
 Asp Ser Lys Trp Asp Asn Val Arg Gly Gln Leu Ser Ser Val Asp Arg
 275 280 285
 His Tyr Gly Ile Val His Asp Ile Leu His Asn Ile Thr Thr His Gln
 290 295 300
 Ile His His Leu Phe Pro Lys Val Pro His Tyr His Leu Glu Glu Ala
 305 310 315 320

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Thr Ser His Phe Arg Ala Ala Phe Pro Glu Leu Val Asn Ile Arg Thr
325 330 335

Asp Arg Thr Phe Pro Ala Phe Tyr Arg Met Phe Lys Lys Tyr Val Lys
340 345 350

Gln Cys Val Ile Pro Asp Asn Thr His Val His Ile Tyr Thr
355 360 365

<210> 128
<211> 1513
<212> DNA
<213> Lottia gigantea

<400> 128
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aatcaactat caaacagtct atgtattacg ttttcaaaga cattatcctt ataatagcgt 420
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gcaacataat cta 1513

eof-seq1.txt

<210> 129
 <211> 1113
 <212> DNA
 <213> Lottia gigantea

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 atgtattacg ttttcaaaga cattatcctt ataatagcgt tatactgttt tggacattgg 240
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<210> 130
 <211> 370
 <212> PRT
 <213> Lottia gigantea

<400> 130
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 20 25 30
 Gly Val Ala Asn Lys Ile Pro Ser Ile Ser Glu Ile Lys Ala Ala Ile
 35 40 45
 Pro Asn His Cys Phe Lys Ser Thr Ile Lys Gln Ser Met Tyr Tyr Val
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Lys Leu Asp Ser Trp Leu Phe Phe Pro Ile Phe Trp Val Leu Gln Gly
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<213> Physcomitrella patens

<400> 147

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

Pro Lys His Cys Trp Glu Arg Ser Ile Pro Arg Ser Leu Arg Tyr Val
50 55 60

Ala Asn Asp Ile Ala Ile Val Val Ala Leu Ala Val Val Ala Ala Tyr
65 70 75 80

Val Asp Ser Trp Phe Leu Trp Pro Phe Tyr Trp Phe Val Gln Gly Thr
85 90 95

Met Phe Trp Ser Leu Phe Val Leu Gly His Asp Cys Gly His Gly Ser
100 105 110

Phe Ser Pro Ser Arg Arg Leu Asn Asn Phe Val Gly His Ile Val His
115 120 125

Ser Phe Ile Leu Val Pro Tyr His Gly Trp Arg Ile Ser His Arg Thr
130 135 140

His His Ala Asn His Gly His Val Glu Asn Asp Glu Ser Trp Tyr Pro
145 150 155 160

Met Thr Glu Ala Leu Tyr Arg Thr Leu Asn Ile Phe Glu Lys Leu Gly
165 170 175

Arg Leu Gln Phe Pro Phe Pro Leu Leu Ala Tyr Pro Phe Tyr Leu Trp
180 185 190

Thr Arg Ser Pro Gly Lys Asn Gly Thr His Tyr Ser Pro Ser Ser Asp
195 200 205

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

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

Phe Leu Trp Thr Phe Lys Leu Tyr Phe Ile Pro Tyr Ile Val Asn Val
245 250 255

eof-seq1.txt

Val Trp Leu Asp Phe Val Thr Tyr Leu His His His Gly Tyr Glu Lys
260 265 270

Lys Ile Pro Trp Tyr Arg Gly Gln Glu Trp Asn Tyr Met Arg Gly Gly
275 280 285

Leu Ser Thr Ile Asp Arg Asp Tyr Gly Ile Phe Asn Lys Ile His His
290 295 300

Asp Ile Gly Thr His Val Val His His Leu Phe Pro Gln Ile Pro His
305 310 315 320

Tyr His Leu Val Glu Ala Thr Ala Ala Val Lys Pro Leu Leu Gly Asn
325 330 335

Tyr Tyr Arg Glu Pro Lys Arg Ser Gly Leu Ile Pro Leu His Leu Leu
340 345 350

Pro Ile Leu Val Lys Ser Phe Asn Glu Asp His Tyr Val Ala Asp Glu
355 360 365

Gly Asp Ile Val Phe Tyr Gln Asn Asp Val Lys Gln
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<210> 148
<211> 1495
<212> DNA
<213> Physcomitrella patens

<400> 148
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 <211> 1095
 <212> DNA
 <213> Physcomitrella patens

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 <212> PRT
 <213> Physcomitrella patens

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<400> 150

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Lys His Cys Trp Glu Arg Ser Leu Ser Arg Ser Phe Ser Tyr Val Val
35 40 45

Arg Asp Val Ala Ile Val Val Thr Leu Ala Tyr Val Ala Val Tyr Phe
50 55 60

Asp Ser Trp Phe Leu Trp Pro Val Tyr Trp Leu Ala Gln Gly Thr Met
65 70 75 80

Phe Trp Ala Ile Phe Val Leu Gly His Asp Cys Gly His Gly Ser Phe
85 90 95

Ser Ser Asn Lys Ser Leu Asn Asn Leu Val Gly His Ile Leu His Ser
100 105 110

Phe Ile Leu Val Pro Tyr His Gly Trp Arg Ile Ser His Arg Thr His
115 120 125

His Ala Asn His Gly His Val Lys Asn Asp Glu Ser Trp Tyr Pro Met
130 135 140

Thr Glu Gly Leu Phe Ile Thr Leu Asp Phe Trp Gly Lys Phe Gly Arg
145 150 155 160

Leu Asn Phe Pro Ala Thr Leu Phe Ala Tyr Pro Ala Tyr Leu Trp Trp
165 170 175

Arg Thr Pro Gly Lys Ser Gly Ser His Phe Asn Pro Ser Ser Asp Leu
180 185 190

Phe Asp Pro Ser Glu Trp Lys Glu Val Ala Thr Ser Thr Thr Cys Trp
195 200 205

Leu Thr Met Val Ala Ile Ser Met Thr Ser Val Ser Gln Val Gly Phe
210 215 220

Leu Phe Val Phe Lys Leu Tyr Phe Val Pro Tyr Ile Val Asn Val Met
225 230 235 240

Trp Leu Asp Ala Val Thr Tyr Leu His His His Gly Tyr Glu Lys Gln
245 250 255

Ile Pro Trp Tyr Arg Gly Gln Glu Trp Ser Tyr Leu Arg Gly Gly Leu
260 265 270

eof-seq1.txt

Ser Thr Ile Asp Arg Asp Tyr Gly Leu Phe Asn Glu Ile His His Asp
275 280 285

Ile Gly Thr His Val Val His His Leu Phe Pro Gln Ile Pro His Tyr
290 295 300

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

Tyr Arg Glu Pro Gln Lys Ser Gly Leu Phe Pro Leu His Leu Ile Ser
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Val Met Met Lys Ser Phe Ser Glu His His Phe Val Ala Asp Glu Cys
340 345 350

Asp Ile Val Phe Tyr Gln Lys Ser Thr Asn Ala Lys
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<210> 151
<211> 2468
<212> DNA
<213> Postia placenta

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<210> 152
 <211> 1284
 <212> DNA
 <213> Postia placenta

<400> 152	
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cttggtttatt	360
tgcggtcacg	420
cacacgttcc	480

eof-seq1.txt

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<210> 153
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 <212> PRT
 <213> Postia placenta

<400> 153

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Thr Leu Ser Glu Ile Arg Ala Ala Ile Pro Ala His Leu His Ala Arg
35 40 45

Gln Thr Trp Lys Gly Met Leu Tyr Leu Leu Arg Asp Ile Leu Met Ala
50 55 60

Ala Ile Val Trp Lys Leu Ala Leu Tyr Ile Asp Pro Ser Phe Lys Ser
65 70 75 80

Glu Thr Ala Val Arg Thr Leu Thr Pro Val Gly Ala Glu Ala Ala Arg
85 90 95

Trp Gly Ala Trp Leu Val Tyr Trp Trp Phe Gln Gly Leu Ile Phe Thr
100 105 110

Gly Ile Trp Val Ile Gly His Glu Cys Gly His Gly Ala Phe Ser Ser
115 120 125

Asn Lys Arg Ile Cys Asp Ile Ile Gly Phe Ile Thr His Thr Phe Leu
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 Trp Thr Pro Tyr Phe Ser Trp Gln Ile Ser His His Arg His His Ser
 145 150 155 160
 Asn His Ala Ser Met Glu Arg Asp Glu Val Tyr Val Pro Lys Thr Arg
 165 170 175
 Ala Asp Leu Gly Ile Pro Lys Glu Ser Glu Gly Ala Ile Asp Tyr Glu
 180 185 190
 Asp Tyr Leu Gly Asp Thr Pro Ile Tyr Thr Leu Phe Ala Leu Ile Arg
 195 200 205
 Gln Gln Val Leu Ala Phe Pro Ala Tyr Leu Leu Phe Asn Val Ser Gly
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 Gln Lys Asn Tyr Pro Lys Trp Thr Asn His Phe Asp Pro Asn Ser Ile
 225 230 235 240
 Leu Phe Thr Lys Arg Gln Arg Asn Ala Val Ile Met Ser Asn Ile Gly
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 Ile Ala Thr Met Val Tyr Ile Val Leu Glu Ala Ser Arg Thr Trp Gly
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 Thr Val Asp Arg Asn Phe Leu Gly Trp Gln Gly Arg Phe Phe Leu His
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 Asp Val Ala His Phe His Val Ile His His Phe Phe Pro Met Met Pro
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 Phe Tyr His Gly Pro Glu Ala Thr Lys Tyr Leu Lys Glu Phe Ile Gly
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 Asp His Tyr Arg Tyr Ser Asp Lys Pro Val Phe Lys Ala Leu Trp Asp
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 Thr Tyr Asn Asn Cys Gln Phe Val Glu Asp Glu Gly Asp Ile Leu Phe
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<210> 154
<211> 4066
<212> DNA
<213> Selaginella moellendorffii

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eolf-seq1.txt

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Asn Val Trp Arg Ser Ile Ser Tyr Val Val Arg Asp Ile Ala Val Val
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Pro Leu Tyr Trp Ala Ala Gln Gly Thr Met Phe Trp Ala Leu Phe Val
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Asn His Val Phe Gly His Ile Leu His Ser Ser Ile Leu Val Pro Tyr
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Asp Ala Asp Ile Phe Thr Arg Phe Gly Arg Phe Gln Leu Pro Trp Val
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Gly Ser His Phe His Pro Asp Ser Ser Leu Phe Val Pro Ser Glu Arg
195 200 205

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

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