

SEQUENCE LISTING

<110> Firmenich SA

<120> Method for producing sclareol

<130> 7270

<160> 88

<170> PatentIn version 3.5

<210> 1

<211> 785

<212> PRT

<213> Salvia sclarea

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

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

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

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Arg Leu Ala Gln Ile Gln Asp Asn Lys Ile Leu Gln Val Val Asp Gly
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Ser Ile Lys Asp Lys Glu Leu Glu Gln Asp Met Gln Ala Leu Val Lys
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Leu Val Leu Gln Glu Asn Gly Gly Ala Val Asp Arg Asn Ile Arg His
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Thr Phe Leu Ser Val Ser Lys Thr Phe Tyr Tyr Asp Ala Tyr His Asp
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<213> Salvia sclarea

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35 40 45

Lys Gln Leu Ser Gln Ile Ala Glu Leu Arg Val Thr Ser Leu Asp Ala
50 55 60

Ser Gln Ala Ser Glu Lys Asp Ile Ser Leu Val Gln Thr Pro His Lys
65 70 75 80

Val Glu Val Asn Glu Lys Ile Glu Glu Ser Ile Glu Tyr Val Gln Asn
 85 90 95

Leu Leu Met Thr Ser Gly Asp Gly Arg Ile Ser Val Ser Pro Tyr Asp
 100 105 110

Thr Ala Val Ile Ala Leu Ile Lys Asp Leu Lys Gly Arg Asp Ala Pro
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Gln Phe Pro Ser Cys Leu Glu Trp Ile Ala His His Gln Leu Ala Asp
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Gly Ser Trp Gly Asp Glu Phe Phe Cys Ile Tyr Asp Arg Ile Leu Asn
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Ile Ile Glu Lys Gly Val Thr Tyr Ile Lys Glu Asn Val His Lys Leu
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Pro Thr Phe Met Gln Met Ala Thr Asp Leu Gly Ile Gln Gly Leu Pro
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Tyr Asp His Pro Leu Ile Lys Glu Ile Ala Asp Thr Lys Gln Gln Arg
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Leu Lys Glu Ile Pro Lys Asp Leu Val Tyr Gln Met Pro Thr Asn Leu
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His Leu Phe Asp Glu Ile Lys Leu Gly Leu Lys Met Pro Trp Tyr Ala
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Thr Leu Pro Arg Val Glu Ala Ala Tyr Tyr Leu Asp His Tyr Ala Gly
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Ser Gly Asp Val Trp Ile Gly Lys Ser Phe Tyr Arg Met Pro Glu Ile
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Ser Asn Asp Thr Tyr Lys Glu Leu Ala Ile Leu Asp Phe Asn Arg Cys
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Gln Thr Gln His Gln Leu Glu Trp Ile Gln Met Gln Glu Trp Tyr Asp
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Asn Glu Tyr Thr Ala Leu Ser Thr Leu Thr Asn Lys Ile Cys Asn Arg
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Leu Ala Gln Ile Gln Asp Asn Lys Ile Leu Gln Val Val Asp Gly Ser
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Ile Lys Asp Lys Glu Leu Glu Gln Asp Met Gln Ala Leu Val Lys Leu
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Asp Phe Met Ala Lys Met Lys Glu Asn Phe Lys Arg Glu Asp Asp Lys
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Phe Pro Thr Thr Thr Thr Leu Arg Ser Glu Asp Ile Pro Ser Asn Leu
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Cys Ile Ile Asp Thr Leu Gln Arg Leu Gly Val Asp Gln Phe Phe Gln
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Lys His Lys Val Ile Tyr Gly Asn Val Thr Thr His Ala Met Ala Phe
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Pro Tyr Gly Asn Gln Glu Ala Val Ser Gln Gln Thr Asn Asp Leu Pro
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Glu Arg Ser Leu Glu Lys Ile Leu Ala Trp Thr Thr Ile Phe Leu Asn
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Lys Gln Val Gln Asp Asn Ser Ile Pro Asp Lys Lys Leu His Lys Leu
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Val Glu Phe Tyr Leu Arg Asn Tyr Lys Gly Ile Thr Ile Arg Leu Gly
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Ala Arg Arg Asn Leu Glu Leu Tyr Asp Met Thr Tyr Tyr Gln Ala Leu
225 230 235 240

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

<213> *Salvia sclarea*

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<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (15)..(15)
<223> n is a, c, g, or t

<400> 8
gtyttncna kccanacrtc ryyt

24

<210> 9
<211> 354
<212> DNA
<213> Salvia sclarea

<400> 9
gcgtaggct tctcaaatg cacggatacg acgtcgatcc aaatgtacta aaacatttca 60
agcaacaaga tggtaaattt tctgctaca ttggtaac ggtcgagtct gcatctcaa 120
tgtacaatct ttatagggt gctcaactaa gattccagg agaagaagtt ctgaagaag 180
ccactaaatt tgcctttaac ttctgcaag aaatgctagt caaagatcga ctcaagaaa 240
gatgggtgat atccgaccac ttattgatg agataaagct ggggtgaag atgcatggt 300
acgccactct accccgagtc gaggtgcat attatctaga ccattatgct gggt 354

<210> 10
<211> 29
<212> DNA
<213> Artificial sequence

<220>
<223> Primer designed specifically for FN23

<400> 10
gcacggatac gacgtcgatc caaatgtac

29

<210> 11
<211> 27
<212> DNA
<213> Artificial sequence

<220>
<223> Primer designed specifically for FN23

<400> 11
gggctgctca actaagattt ccaggag

27

<210> 12

<211> 29
<212> DNA
<213> Artificial sequence

<220>
<223> Primer designed specifically for FN23

<400> 12
gggtgatatc cgaccactta ttgatgag 29

<210> 13
<211> 36
<212> DNA
<213> Artificial sequence

<220>
<223> Adaptor sequence to extend oligodT primers

<400> 13
aattcggtac ccgggacacct tttttttt ttttt 36

<210> 14
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 14
aattcggtac ccgggatcc 19

<210> 15
<211> 1271
<212> DNA
<213> Salvia sclarea

<400> 15
aagaagttct tgaagaagcc actaaatttg cctttaactt ctgcaagaa atgctagtca 60
aagatcgact tcaagaaaga tgggtgatat ccgaccactt atttgatgag ataaagctgg 120
ggttgaagat gccatggtac gccactctac cccgagtcga ggctgcatat tatctagacc 180
attatgctgg ttctggtgat gtatggattg gcaagagttt ctacaggatg ccagaaatca 240

gcaatgatac atacaaggag ctgcgatat tggattcaa cagatgccaa acacaacatc 300
 agttggagtg gatccatatg caggaatggt acgacagatg cagccttagc gaattcggga 360
 taagcaaaag agagttgctt cgctcttact ttctggccgc agcaaccata ttcgaaccgg 420
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 atcaacttct agacggattc gatatacaca ctctccatca actcaaacat gtttgagcc 660
 aatgggtcat gaaagtgcag caaggagagg gaagcggcgg ggaagacgcg gtgctcctag 720
 cgaacacgct caacatctgc gccggcctca acgaagacgt gttgtccaac aatgaataca 780
 cggctctgtc caccctcaca aataaaatct gcaatcgctt cgcccaaatt caagacaata 840
 agattctcca agttgtgat gggagcataa aggataagga gctagaacag gatatgcagg 900
 cgttggtgaa gttagtgtt caagaaaatg gcggcgccgt agacagaaac atcagacaca 960
 cgttttgtc ggtttccaag actttctact acgatgccta ccacgacgat gagacgaccg 1020
 atcttcatat ctcaaagta ctcttcgac cggttgtatg aaaaatattt taagctcgtc 1080
 tgcagtccac gtagataatt attttaaata aaaggataaa ttaacgagaa acgacgcat 1140
 tttaaataa tatgttaaga atggacccta aataagagcg tcgaaacatg cattgggata 1200
 taattatta attgttacac catttcggaa taaatgatg ttattcttt tcatatgta 1260
 aaaaaaaaaa a 1271

<210> 16
 <211> 32
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Primer designed specifically for FN23

<400> 16
 catggcatct tcaaccccag ctttatctca tc 32

<210> 17
<211> 33
<212> DNA
<213> Artificial sequence

<220>

<223> Primer designed specifically for FN23

<400> 17

gtggtcggat atcaccatc ttcttgaag tcg 33

<210> 18

<211> 30

<212> DNA

<213> Artificial sequence

<220>

<223> Primer designed specifically for FN23

<400> 18

cattggagat gcagactcga ccgattgacc 30

<210> 19

<211> 1449

<212> DNA

<213> Salvia sclarea

<400> 19

caaaattctc ttccatttt aagataatag taatattcta atttcctc caaaaactcg 60

tgggaaattg aaaaatagaa aataaagatg acttctgtaa attgagcag agcaccagca 120

gcgattatcc ggcgcaggct gcagctacag ccggaatttc atgccgagtg tcatggctg 180

aaaagcagca gcaaacacgc gcccttgacc ttgagttgcc aaatccgtcc taagcaactc 240

tcccaaatag ctgaattgag agtaacaagc ctggatgcgt cgcaagcgag tgaaaaagac 300

atttccttg tcaaaactcc gcataagggt gaggttaatg aaaagatcga ggagtcaatc 360

gagtacgtcc aaaatctgtt gatgacgtcg ggcgacgggc gaataagcgt gtcaccctat 420

gacacggcag tgatgccct gatcaaggac ttgaaagggc gcgacgcccc gcagtttccg 480

tcatgtctcg agtggatcgc gcaccaccaa ctggctgatg gctcatgggg cgacgaattc 540
 ttctgtattt atgatcggat tctaaataca ttggcatgtg tcgtagcctt gaaatcatgg 600
 aaccttcaact ctgatattat tgaaaaagga gtgacgtaca tcaaggagaa tgtgcataaa 660
 cttaaagggtg caaatgttga gcacaggaca gcgggggttcg aacttgttgt tcctactttt 720
 atgcaaattg ccacagattt gggcatccaa gatctgccct atgatcatcc cctcatcaag 780
 gagattgctg acacaaaaca acaaagattg aaagagatac ccaaggattt ggtttacaa 840
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 ctgaaactgc agtcgggcaa tggctccttc ctcacttcgc cgctgtccac cgccgccgtc 960
 ttgatgcata ccaaagatga aaaatgtttg aaatacatcg aaaacgccct caagaattgc 1020
 gacggaggag caccacatac ttatccagtc gatattctct caagactttg ggcaatcgat 1080
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 gatattgatg acacgtccat gggcgtagg ctctcaaaa tgcacggata cgacgtcgat 1260
 ccaaattgtac taaaacattt caagcaacaa gatggtaaatt ttctctgcta cattggtaa 1320
 tcggctgagt ctgcatctcc aatgtacaat ctttataggg ctgctcaact aagatttcca 1380
 ggagaagaag ttctgaaga agccactaaa ttgccttta acttcttgca agaaatgcta 1440
 gtcaaagat 1449

<210> 20
 <211> 2655
 <212> DNA
 <213> Salvia sclarea

<400> 20
 caaaattctc ttccattttt aagataatag taatattcta atttccctc caaaaactcg 60
 tgggaaattg aaaaatagaa aataaagatg acttctgtaa attgagcag agcaccagca 120
 gcgattatcc ggcgcaggct gcagctacag ccggaatttc atgccgagtg tcatggctg 180
 aaaagcagca gcaaacacgc gcccttgacc ttgagttgcc aaatccgtcc taagcaactc 240

tcccaaatag ctgaattgag agtaacaagc ctggatgcgt cgcaagcgag tgaaaaagac 300
 attcccttg ticaaactcc gcataagggt gaggttaatg aaaagatcga ggagtcaatc 360
 gagtacgtcc aaaatctgtt gatgacgtcg ggcgacgggc gaataagcgt gtcaccctat 420
 gacacggcag tgatcgccct gatcaaggac ttgaaagggc gcgacgcccc gcagtttccg 480
 tcatgtctcg agtggatcgc gcaccaccaa ctggctgatg gctcatgggg cgacgaattc 540
 ttctgtattt atgatcggat tctaaataca ttggcatgtg tcgtagcctt gaaatcatgg 600
 aaccttact ctgatattat tgaaaaagga gtgacgtaca tcaaggagaa tgtgcataaa 660
 cttaaagggtg caaatgttga gcacaggaca gcgggggttcg aacttgtgtt tectactttt 720
 atgcaaatgg ccacagattt gggcatccaa gatctgcctt atgatcatcc cctcatcaag 780
 gagattgctg acacaaaaca acaaagattg aaagagatac ccaaggattt ggtttaccaa 840
 atgccaacga atttactgta cagtttagaa gggtaggag atttgagtg ggaaaggcta 900
 ctgaaactgc agtcgggcaa tggctcctt ctcacttcgc cgtcgtccac cgccgccgtc 960
 ttgatgcata ccaaagatga aaaatgtttg aaatacatcg aaaacgccct caagaattgc 1020
 gacggaggag caccacatac ttatccagtc gatattctt caagacttg ggcaatcgat 1080
 aggctacaac gcctaggaat ttctcgttc ttccagcacg agatcaagta ttcttagat 1140
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 gatattgatg acacgtccat gggcgtagg ctctcaaaa tgcacggata cgacgtcgat 1260
 ccaaatgtac taaaacattt caagcaacaa gatggtaaatt ttctctgcta cattggtaa 1320
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 ggagaagaag ttctgaaga agccactaaa ttgccttta acttcttgca agaaatgcta 1440
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 gaccattatg ctgggtctgg tgatgtatgg attggcaaga gtttctacag gatgccagaa 1620
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catcagttgg agtggatcca tatgcaggaa tggtagaca gatgcagcct tagcgaattc 1740
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ccattttaa ataatatgtt aagaatggac cctaaataag agcgtcgaaa catgcattgg 2580
gatataattt attaatgtt acaccatttc ggaataaaat gatgttattt cttttcata 2640
tgtaaaaaaa aaaaa 2655

<210> 21
<211> 785
<212> PRT
<213> Salvia sclarea

<400> 21

Met Thr Ser Val Asn Leu Ser Arg Ala Pro Ala Ala Ile Ile Arg Arg
1 5 10 15

Arg Leu Gln Leu Gln Pro Glu Phe His Ala Glu Cys Ser Trp Leu Lys

20 25 30

Ser Ser Ser Lys His Ala Pro Leu Thr Leu Ser Cys Gln Ile Arg Pro
35 40 45

Lys Gln Leu Ser Gln Ile Ala Glu Leu Arg Val Thr Ser Leu Asp Ala
50 55 60

Ser Gln Ala Ser Glu Lys Asp Ile Ser Leu Val Gln Thr Pro His Lys
65 70 75 80

Val Glu Val Asn Glu Lys Ile Glu Glu Ser Ile Glu Tyr Val Gln Asn
85 90 95

Leu Leu Met Thr Ser Gly Asp Gly Arg Ile Ser Val Ser Pro Tyr Asp
100 105 110

Thr Ala Val Ile Ala Leu Ile Lys Asp Leu Lys Gly Arg Asp Ala Pro
115 120 125

Gln Phe Pro Ser Cys Leu Glu Trp Ile Ala His His Gln Leu Ala Asp
130 135 140

Gly Ser Trp Gly Asp Glu Phe Phe Cys Ile Tyr Asp Arg Ile Leu Asn
145 150 155 160

Thr Leu Ala Cys Val Val Ala Leu Lys Ser Trp Asn Leu His Ser Asp
165 170 175

Ile Ile Glu Lys Gly Val Thr Tyr Ile Lys Glu Asn Val His Lys Leu
180 185 190

Lys Gly Ala Asn Val Glu His Arg Thr Ala Gly Phe Glu Leu Val Val
195 200 205

Pro Thr Phe Met Gln Met Ala Thr Asp Leu Gly Ile Gln Asp Leu Pro

210 215 220

Tyr Asp His Pro Leu Ile Lys Glu Ile Ala Asp Thr Lys Gln Gln Arg
225 230 235 240

Leu Lys Glu Ile Pro Lys Asp Leu Val Tyr Gln Met Pro Thr Asn Leu
245 250 255

Leu Tyr Ser Leu Glu Gly Leu Gly Asp Leu Glu Trp Glu Arg Leu Leu
260 265 270

Lys Leu Gln Ser Gly Asn Gly Ser Phe Leu Thr Ser Pro Ser Ser Thr
275 280 285

Ala Ala Val Leu Met His Thr Lys Asp Glu Lys Cys Leu Lys Tyr Ile
290 295 300

Glu Asn Ala Leu Lys Asn Cys Asp Gly Gly Ala Pro His Thr Tyr Pro
305 310 315 320

Val Asp Ile Phe Ser Arg Leu Trp Ala Ile Asp Arg Leu Gln Arg Leu
325 330 335

Gly Ile Ser Arg Phe Phe Gln His Glu Ile Lys Tyr Phe Leu Asp His
340 345 350

Ile Glu Ser Val Trp Glu Glu Thr Gly Val Phe Ser Gly Arg Tyr Thr
355 360 365

Lys Phe Ser Asp Ile Asp Asp Thr Ser Met Gly Val Arg Leu Leu Lys
370 375 380

Met His Gly Tyr Asp Val Asp Pro Asn Val Leu Lys His Phe Lys Gln
385 390 395 400

Gln Asp Gly Lys Phe Ser Cys Tyr Ile Gly Gln Ser Val Glu Ser Ala

405

410

415

Ser Pro Met Tyr Asn Leu Tyr Arg Ala Ala Gln Leu Arg Phe Pro Gly
420 425 430

Glu Glu Val Leu Glu Glu Ala Thr Lys Phe Ala Phe Asn Phe Leu Gln
435 440 445

Glu Met Leu Val Lys Asp Arg Leu Gln Glu Arg Trp Val Ile Ser Asp
450 455 460

His Leu Phe Asp Glu Ile Lys Leu Gly Leu Lys Met Pro Trp Tyr Ala
465 470 475 480

Thr Leu Pro Arg Val Glu Ala Ala Tyr Tyr Leu Asp His Tyr Ala Gly
485 490 495

Ser Gly Asp Val Trp Ile Gly Lys Ser Phe Tyr Arg Met Pro Glu Ile
500 505 510

Ser Asn Asp Thr Tyr Lys Glu Leu Ala Ile Leu Asp Phe Asn Arg Cys
515 520 525

Gln Thr Gln His Gln Leu Glu Trp Ile His Met Gln Glu Trp Tyr Asp
530 535 540

Arg Cys Ser Leu Ser Glu Phe Gly Ile Ser Lys Arg Glu Leu Leu Arg
545 550 555 560

Ser Tyr Phe Leu Ala Ala Ala Thr Ile Phe Glu Pro Glu Arg Thr Gln
565 570 575

Glu Arg Leu Leu Trp Ala Lys Thr Arg Ile Leu Ser Lys Met Ile Thr
580 585 590

Ser Phe Val Asn Ile Ser Gly Thr Thr Leu Ser Leu Asp Tyr Asn Phe

595 600 605

Asn Gly Leu Asp Glu Ile Ile Ser Ser Ala Asn Glu Asp Gln Gly Leu
610 615 620

Ala Gly Thr Leu Leu Ala Thr Phe His Gln Leu Leu Asp Gly Phe Asp
625 630 635 640

Ile Tyr Thr Leu His Gln Leu Lys His Val Trp Ser Gln Trp Phe Met
645 650 655

Lys Val Gln Gln Gly Glu Gly Ser Gly Gly Glu Asp Ala Val Leu Leu
660 665 670

Ala Asn Thr Leu Asn Ile Cys Ala Gly Leu Asn Glu Asp Val Leu Ser
675 680 685

Asn Asn Glu Tyr Thr Ala Leu Ser Thr Leu Thr Asn Lys Ile Cys Asn
690 695 700

Arg Leu Ala Gln Ile Gln Asp Asn Lys Ile Leu Gln Val Val Asp Gly
705 710 715 720

Ser Ile Lys Asp Lys Glu Leu Glu Gln Asp Met Gln Ala Leu Val Lys
725 730 735

Leu Val Leu Gln Glu Asn Gly Gly Ala Val Asp Arg Asn Ile Arg His
740 745 750

Thr Phe Leu Ser Val Ser Lys Thr Phe Tyr Tyr Asp Ala Tyr His Asp
755 760 765

Asp Glu Thr Thr Asp Leu His Ile Phe Lys Val Leu Phe Arg Pro Val
770 775 780

Val

785

<210> 22
<211> 38
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 22
tactgacata tgacttctgt aaatttgagc agagcacc 38

<210> 23
<211> 36
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 23
ttggtacctc atacaaccgg tcgaaagagt actttg 36

<210> 24
<211> 31
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 24
gttggagtgg atccacatgc aggaatggta c 31

<210> 25
<211> 31
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 25

gtaccattcc tgcattcgga tccactccaa c

31

<210> 26

<211> 805

<212> PRT

<213> Salvia sclarea

<400> 26

Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro
1 5 10 15

Arg Gly Ser His Met Thr Ser Val Asn Leu Ser Arg Ala Pro Ala Ala
20 25 30

Ile Thr Arg Arg Arg Leu Gln Leu Gln Pro Glu Phe His Ala Glu Cys
35 40 45

Ser Trp Leu Lys Ser Ser Ser Lys His Ala Pro Leu Thr Leu Ser Cys
50 55 60

Gln Ile Arg Pro Lys Gln Leu Ser Gln Ile Ala Glu Leu Arg Val Thr
65 70 75 80

Ser Leu Asp Ala Ser Gln Ala Ser Glu Lys Asp Ile Ser Leu Val Gln
85 90 95

Thr Pro His Lys Val Glu Val Asn Glu Lys Ile Glu Glu Ser Ile Glu
100 105 110

Tyr Val Gln Asn Leu Leu Met Thr Ser Gly Asp Gly Arg Ile Ser Val
115 120 125

Ser Pro Tyr Asp Thr Ala Val Ile Ala Leu Ile Lys Asp Leu Lys Gly
130 135 140

Arg Asp Ala Pro Gln Phe Pro Ser Cys Leu Glu Trp Ile Ala His His
145 150 155 160

Gln Leu Ala Asp Gly Ser Trp Gly Asp Glu Phe Phe Cys Ile Tyr Asp
165 170 175

Arg Ile Leu Asn Thr Leu Ala Cys Val Val Ala Leu Lys Ser Trp Asn
180 185 190

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

Val His Lys Leu Lys Gly Ala Asn Val Glu His Arg Thr Ala Gly Phe
210 215 220

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

Gln Asp Leu Pro Tyr Asp His Pro Leu Ile Lys Glu Ile Ala Asp Thr
245 250 255

Lys Gln Gln Arg Leu Lys Glu Ile Pro Lys Asp Leu Val Tyr Gln Met
260 265 270

Pro Thr Asn Leu Leu Tyr Ser Leu Glu Gly Leu Gly Asp Leu Glu Trp
275 280 285

Glu Arg Leu Leu Lys Leu Gln Ser Gly Asn Gly Ser Phe Leu Thr Ser
290 295 300

Pro Ser Ser Thr Ala Ala Val Leu Met His Thr Lys Asp Glu Lys Cys
305 310 315 320

Leu Lys Tyr Ile Glu Asn Ala Leu Lys Asn Cys Asp Gly Gly Ala Pro
325 330 335

His Thr Tyr Pro Val Asp Ile Phe Ser Arg Leu Trp Ala Ile Asp Arg
340 345 350

Leu Gln Arg Leu Gly Ile Ser Arg Phe Phe Gln His Glu Ile Lys Tyr
355 360 365

Phe Leu Asp His Ile Glu Ser Val Trp Glu Glu Thr Gly Val Phe Ser
370 375 380

Gly Arg Tyr Thr Lys Phe Ser Asp Ile Asp Asp Thr Ser Met Gly Val
385 390 395 400

Arg Leu Leu Lys Met His Gly Tyr Asp Val Asp Pro Asn Val Leu Lys
405 410 415

His Phe Lys Gln Gln Asp Gly Lys Phe Ser Cys Tyr Ile Gly Gln Ser
420 425 430

Val Glu Ser Ala Ser Pro Met Tyr Asn Leu Tyr Arg Ala Ala Gln Leu
435 440 445

Arg Phe Pro Gly Glu Glu Val Leu Glu Glu Ala Thr Lys Phe Ala Phe
450 455 460

Asn Phe Leu Gln Glu Met Leu Val Lys Asp Arg Leu Gln Glu Arg Trp
465 470 475 480

Val Ile Ser Asp His Leu Phe Asp Glu Ile Lys Leu Gly Leu Lys Met
485 490 495

Pro Trp Tyr Ala Thr Leu Pro Arg Val Glu Ala Ala Tyr Tyr Leu Asp
500 505 510

His Tyr Ala Gly Ser Gly Asp Val Trp Ile Gly Lys Ser Phe Tyr Arg
515 520 525

Met Pro Glu Ile Ser Asn Asp Thr Tyr Lys Glu Leu Ala Ile Leu Asp
530 535 540

Phe Asn Arg Cys Gln Thr Gln His Gln Leu Glu Trp Ile His Met Gln
545 550 555 560

Glu Trp Tyr Asp Arg Cys Ser Leu Ser Glu Phe Gly Ile Ser Lys Arg
 565 570 575

Glu Leu Leu Arg Ser Tyr Phe Leu Ala Ala Ala Thr Ile Phe Glu Pro
 580 585 590

Glu Arg Thr Gln Glu Arg Leu Leu Trp Ala Lys Thr Arg Ile Leu Ser
 595 600 605

Lys Met Ile Thr Ser Phe Val Asn Ile Ser Gly Thr Thr Leu Ser Leu
 610 615 620

Asp Tyr Asn Phe Asn Gly Leu Asp Glu Ile Ile Ser Ser Ala Asn Glu
625 630 635 640

Asp Gln Gly Leu Ala Gly Thr Leu Leu Ala Thr Phe His Gln Leu Leu
 645 650 655

Asp Gly Phe Asp Ile Tyr Thr Leu His Gln Leu Lys His Val Trp Ser
 660 665 670

Gln Trp Phe Met Lys Val Gln Gln Gly Glu Gly Ser Gly Gly Glu Asp
 675 680 685

Ala Val Leu Leu Ala Asn Thr Leu Asn Ile Cys Ala Gly Leu Asn Glu
 690 695 700

Asp Val Leu Ser Asn Asn Glu Tyr Thr Ala Leu Ser Thr Leu Thr Asn
705 710 715 720

Lys Ile Cys Asn Arg Leu Ala Gln Ile Gln Asp Asn Lys Ile Leu Gln
 725 730 735

Val Val Asp Gly Ser Ile Lys Asp Lys Glu Leu Glu Gln Asp Met Gln
740 745 750

Ala Leu Val Lys Leu Val Leu Gln Glu Asn Gly Gly Ala Val Asp Arg
755 760 765

Asn Ile Arg His Thr Phe Leu Ser Val Ser Lys Thr Phe Tyr Tyr Asp
770 775 780

Ala Tyr His Asp Asp Glu Thr Thr Asp Leu His Ile Phe Lys Val Leu
785 790 795 800

Phe Arg Pro Val Val
805

<210> 27
<211> 804
<212> PRT
<213> Salvia sclarea

<400> 27

Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro
1 5 10 15

Arg Gly Ser His Met Thr Ser Val Asn Leu Ser Arg Ala Pro Ala Ala
20 25 30

Ile Ile Arg Arg Arg Leu Gln Leu Gln Pro Glu Phe His Ala Glu Cys
35 40 45

Ser Trp Leu Lys Ser Ser Ser Lys His Ala Pro Phe Thr Leu Ser Cys
50 55 60

Gln Ile Arg Pro Lys Gln Leu Ser Gln Ile Ala Glu Leu Arg Val Thr
65 70 75 80

Ser Leu Asp Ala Ser Gln Ala Ser Glu Lys Asp Ile Ser Leu Val Gln
85 90 95

Thr Pro His Lys Val Glu Val Asn Glu Lys Ile Glu Glu Ser Ile Glu
100 105 110

Tyr Val Gln Asn Leu Leu Met Thr Ser Gly Asp Gly Arg Ile Ser Val
115 120 125

Ser Pro Tyr Asp Thr Ala Val Ile Ala Leu Ile Lys Asp Leu Lys Gly
130 135 140

Arg Asp Ala Pro Gln Phe Pro Ser Cys Leu Glu Trp Ile Ala His His
145 150 155 160

Gln Leu Ala Asp Gly Ser Trp Gly Asp Glu Phe Phe Cys Ile Tyr Asp
165 170 175

Arg Ile Leu Asn Thr Leu Ala Cys Val Val Ala Leu Lys Ser Trp Asn
180 185 190

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

Val His Lys Leu Lys Gly Ala Asn Val Glu His Arg Thr Ala Gly Phe
210 215 220

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

Gln Gly Leu Pro Tyr Asp His Pro Leu Ile Lys Glu Ile Ala Asp Thr
245 250 255

Lys Gln Gln Arg Leu Lys Glu Ile Pro Lys Asp Leu Val Tyr Gln Met
260 265 270

Pro Thr Asn Leu Leu Tyr Ser Leu Glu Gly Leu Gly Asp Leu Glu Trp
275 280 285

Glu Arg Leu Leu Lys Leu Gln Ser Gly Asn Gly Ser Phe Leu Thr Ser
290 295 300

Pro Ser Ser Thr Ala Ala Val Leu Met His Thr Lys Asp Glu Lys Cys
305 310 315 320

Leu Lys Tyr Ile Glu Asn Ala Leu Lys Asn Cys Asp Gly Gly Ala Pro
325 330 335

His Thr Tyr Pro Val Asp Ile Phe Ser Arg Leu Trp Ala Ile Asp Arg
340 345 350

Leu Gln Arg Leu Gly Ile Ser Arg Phe Phe Gln His Glu Ile Lys Tyr
355 360 365

Phe Leu Asp His Ile Glu Ser Val Trp Glu Glu Thr Gly Val Phe Ser
370 375 380

Gly Arg Tyr Thr Lys Phe Ser Asp Ile Asp Asp Thr Ser Met Gly Val
385 390 395 400

Arg Leu Leu Lys Met His Gly Tyr Asp Val Asp Pro Asn Val Leu Lys
405 410 415

His Phe Lys Gln Gln Asp Gly Lys Phe Ser Cys Tyr Ile Gly Gln Ser
420 425 430

Val Glu Ser Ala Ser Pro Met Tyr Asn Leu Tyr Arg Ala Ala Gln Leu
435 440 445

Arg Phe Pro Gly Glu Glu Val Leu Glu Glu Ala Thr Lys Phe Ala Phe
450 455 460

Asn Phe Leu Gln Glu Met Leu Val Lys Asp Arg Leu Gln Glu Arg Trp
465 470 475 480

Val Ile Ser Asp His Leu Phe Asp Glu Ile Lys Leu Gly Leu Lys Met
 485 490 495

Pro Trp Tyr Ala Thr Leu Pro Arg Val Glu Ala Ala Tyr Tyr Leu Asp
 500 505 510

His Tyr Ala Gly Ser Gly Asp Val Trp Ile Gly Lys Ser Phe Tyr Arg
 515 520 525

Met Pro Glu Ile Ser Asn Asp Thr Tyr Lys Glu Leu Ala Ile Leu Asp
 530 535 540

Phe Asn Arg Cys Gln Thr Gln His Gln Leu Glu Trp Ile Gln Met Gln
545 550 555 560

Glu Trp Tyr Asp Arg Cys Ser Leu Ser Glu Phe Gly Ile Ser Lys Arg
 565 570 575

Glu Leu Leu Arg Ser Tyr Phe Leu Ala Ala Ala Thr Ile Phe Glu Pro
 580 585 590

Glu Arg Thr Gln Glu Arg Leu Leu Trp Ala Lys Thr Arg Ile Leu Ser
 595 600 605

Lys Met Ile Thr Ser Phe Val Asn Ile Ser Gly Thr Thr Leu Ser Leu
 610 615 620

Asp Tyr Asn Phe Asn Gly Leu Asp Glu Ile Ile Ser Ala Asn Glu Asp
625 630 635 640

Gln Gly Leu Ala Gly Thr Leu Leu Ala Thr Phe His Gln Leu Leu Asp
 645 650 655

Gly Phe Asp Ile Tyr Thr Leu His Gln Leu Lys His Val Trp Ser Gln
660 665 670

Trp Phe Met Lys Val Gln Gln Gly Glu Gly Ser Gly Gly Glu Asp Ala
675 680 685

Val Leu Leu Ala Asn Thr Leu Asn Ile Cys Ala Gly Leu Asn Glu Asp
690 695 700

Val Leu Ser Asn Asn Glu Tyr Thr Ala Leu Ser Thr Leu Thr Asn Lys
705 710 715 720

Ile Cys Asn Arg Leu Ala Gln Ile Gln Asp Asn Lys Ile Leu Gln Val
725 730 735

Val Asp Gly Ser Ile Lys Asp Lys Glu Leu Glu Gln Asp Met Gln Ala
740 745 750

Leu Val Lys Leu Val Leu Gln Glu Asn Gly Gly Ala Val Asp Arg Asn
755 760 765

Ile Arg His Thr Phe Leu Ser Val Ser Lys Thr Phe Tyr Tyr Asp Ala
770 775 780

Tyr His Asp Asp Glu Thr Thr Asp Leu His Ile Phe Lys Val Leu Phe
785 790 795 800

Arg Pro Val Val

<210> 28

<211> 2310

<212> DNA

<213> Salvia sclarea

<400> 28

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 ttgagagtaa caagcctgga tgcgtcgcaa gcgagtgaaa aagacatttc ccttggtcaa 180
 actccgcata aggttgaggt taatgaaaag atcgaggagt caatcgagta cgtccaaaat 240
 ctgttgatga cgtcgggcga cgggcgaata agcgtgtcac cctatgacac ggcagtgatc 300
 gccctgatca aggactgaa agggcgcgac gccccgcagt ttccgtcatg tctcgagtgg 360
 atcgcgacc accaactggc tgatggctca tggggcgacg aattctctg tatttatgat 420
 cggattctaa atacattggc atgtgtcgta gcctgaaat catggaacct tcactctgat 480
 attattgaaa aaggagtgc gtacatcaag gagaatgtgc ataaacttaa aggtgcaaata 540
 gttgagcaca ggacagcggg gttcgaactt gtgggtccta ctttatgca aatggccaca 600
 gatttgggca tccaagatct gccctatgat catccctca tcaaggagat tgctgacaca 660
 aaacaacaaa gattgaaaga gataccaag gatttgggtt accaaatgcc aacgaattta 720
 ctgtacagtt tagaagggtt aggagatttg gagtgggaaa ggctactgaa actgcagtcg 780
 ggcaatggct ccttctcac ttgccgtcg tccaccgccg ccgtcttgat gcataccaaa 840
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 catacttacc cagtcgatat ctctcaaga ctttgggcaa tcgataggct acaacgccta 960
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tacaaggagc ttgcgatatt ggatttcaac agatgccaaa cacaacatca gttggagtgg 1560
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gttgtggatg ggagcataaa ggataaggag ctagaacagg atatgcaggc gttggtgaag 2160
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gtttccaaga ctttctacta cgatgcctac cagcagcatg agacgaccga tcttcatatc 2280
ttcaaagtac tcttgcacc gttgtatga 2310

<210> 29
<211> 2253
<212> DNA
<213> Salvia sclarea

<400> 29
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gaattgagag taacaagcct ggatgcgtcg caagcgagtg aaaaagacat ttccttgtt 120
caaactccgc ataagggtga ggtaatgaa aagatcgagg agtcaatcga gtacgtcaa 180
aatctgttga tgacgtcggg cgacgggcca ataagcgtgt caccctatga cacggcagtg 240
atcgccctga tcaaggactt gaaagggcgc gacgccccgc agttccgtc atgtctcgag 300
tggatcgcg accaccaact ggctgatggc tcatggggcg acgaattctt ctgtatttat 360

gatcggattc taaatacatt ggcattgtgc gtagccttga aatcatggaa ccttcactct 420
gatattattg aaaaaggagt gacgtacatc aaggagaatg tgcataaact taaagggtgca 480
aatgttgagc acaggacagc ggggttcgaa cttgtggttc ctactttat gcaaattggcc 540
acagatttgg gcatccaaga tctgccctat gatcatcccc tcatcaagga gattgctgac 600
acaaaacaac aaagattgaa agagataccc aaggatttgg ttaccaaact gccaacgaat 660
ttactgtaca gtttagaagg gttaggagat ttggagtggg aaaggctact gaaactgcag 720
tcgggcaatg gctccttct cacttcgccg tcgtccaccg ccgccgtctt gatgcatacc 780
aaagatgaaa aatgtttgaa atacatcgaa aacgccctca agaattgcga cggaggagca 840
ccacatactt atccagtcga tatcttctca agactttggg caatcgatag gctacaacgc 900
ctaggaattt ctggttctt ccagcacgag atcaagtatt tcttagatca catcgaaagc 960
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caagagaggc ttctgtgggc caaaaccaga attcttcta agatgatcac ttatttgc 1680
aacattagtg gaacaacact atctttggac tacaatttca atggcctcga tgaaataatt 1740
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ctagacggat tcgatatata cactctccat caactcaaac atgtttggag ccaatggttc 1860
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ctcaacatct gcgccggcct caacgaagac gtgtgtcca acaatgaata cacggctctg 1980
tccaccctca caaataaaat ctgcaatcgc ctgccccaaa ttcaagacaa taagattctc 2040
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aagttagtgc ttcaagaaaa tggcggcgcc gtagacagaa acatcagaca cacgttttg 2160
tcggtttcca agactttcta ctacgatgcc taccacgacg atgagacgac cgatcttcat 2220
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<210> 30
<211> 2202
<212> DNA
<213> Salvia sclarea

<400> 30
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tccctgttc aaactccgca taaggttgag gttaatgaaa agatcgagga gtcaatcgag 120
tacgtccaaa atctgtgat gacgtcgggc gacgggcgaa taagcgtgtc accctatgac 180
acggcagtga tcgccctgat caaggacttg aaagggcgcg acgccccgca gttccgtca 240
tgtctcgagt ggatcgcgca ccaccaactg gctgatggct catggggcga cgaattcttc 300
tgtatttatg atcggattct aaatacattg gcatgtgtcg tagccttgaa atcatggaac 360
cttcactctg atattattga aaaaggagtg acgtacatca aggagaatgt gcataaactt 420
aaaggtgcaa atgttgagca caggacagcg gggttcgaac ttgtggttc tacttttatg 480
caaatggcca cagatttggg catccaagat ctgccctatg atcatcccct catcaaggag 540
attgctgaca caaaacaaca aagattgaaa gagataccca aggatttggg ttaccaaagt 600
ccaacgaatt tactgtacag tttagaaggg ttaggagatt tggagtggga aaggctactg 660
aaactgcagt cgggcaatgg ctcttctc acttcgccgt cgtccaccgc cgccgtttg 720
atgcatacca aagatgaaaa atgttgaaa tacatcgaaa acgccctcaa gaattgcgac 780

ggaggagcac cacatactta tccagtcgat atcttctcaa gactttgggc aatcgatagg 840
 ctacaacgcc taggaatttc tcgtttcttc cagcacgaga tcaagtattt cttagatcac 900
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 gcgaacacgc tcaacatctg cgccggcctc aacgaagacg tgttgtccaa caatgaatac 1920
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 aagattctcc aagttgtgga tgggagcata aaggataagg agctagaaca ggatatgcag 2040
 gcgttggtga agttagtgt tcaagaaaat ggcggcgccg tagacagaaa catcagacac 2100
 acgttttgt cggtttcaa gactttctac tacgatgcct accacgacga tgagacgacc 2160
 gatcttcata tcttcaaagt actctttcga ccggttgtat ga 2202

<210> 31
 <211> 2172
 <212> DNA
 <213> *Salvia sclarea*

<400> 31
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 gttaatgaaa agatcgagga gtcaatcgag tacgtccaaa atctgttgat gacgtcgggc 120
 gacgggcgaa taagcgtgtc accctatgac acggcagtga tcgccctgat caaggacttg 180
 aaagggcgcg acgccccgca gttccgtca tgtctcgagt ggatcgcgca ccaccaactg 240
 gctgatggct catggggcga cgaattcttc tgtatttatg atcggattct aaatacattg 300
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 acgtacatca aggagaatgt gcataaactt aaagggtgcaa atgttgagca caggacagcg 420
 ggggtcgaac ttgtgggtcc tacttttatg caaatggcca cagatttggg catccaagat 480
 ctgccctatg atcatcccct catcaaggag attgctgaca caaaacaaca aagattgaaa 540
 gagataccca aggatttggg ttaccaaattg ccaacgaatt tactgtacag tttagaaggg 600
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 acttcgccgt cgtccaccgc cgccgtcttg atgcatacca aagatgaaaa atgttgaaa 720
 tacatgaaa acgcccctca gaattgacgac ggaggagcac cacatactta tccagtcgat 780
 atcttctcaa gactttgggc aatcgatagg ctacaacgcc taggaatttc tcgtttcttc 840
 cagcacgaga tcaagtattt cttagatcac atcgaaagcg ttggggagga gaccggagtt 900
 ttcagtggaa gatatacgaa atttagcgat attgatgaca cgtccatggg cgtaggctt 960
 ctcaaatgc acggatacga cgtcgatcca aatgtactaa aacatttcaa gcaacaagat 1020
 ggtaaatttt cctgctacat tggtaatcg gtcgagtctg catctccaat gtacaatctt 1080
 tatagggtctg ctcaactaag atttcagga gaagaagttc ttgaagaagc cactaaattt 1140
 gcctttaact tcttgcaaga aatgctagtc aaagatcgac ttcaagaaag atgggtgata 1200

tccgaccact tatttgatga gataaagctg ggggtgaaga tgccatggta cgccactcta 1260
 ccccgagtcg aggctgcata ttatctagac cattatgctg gttctgggtga tgtatggatt 1320
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 tcttggact acaatttcaa tggcctcgat gaaataatta gtagtgcaa tgaagatcaa 1680
 ggactggctg ggactctgct ggcaaccttc catcaacttc tagacggatt cgatatatac 1740
 actctccatc aactcaaaca tgtttggagc caatgggtca tgaaagtga gcaaggagag 1800
 ggaagcggcg gggaagacgc ggtgctccta gcgaacacgc tcaacatctg cgccggcctc 1860
 aacgaagacg tgtgtccaa caatgaatac acggctctgt ccaccctcac aaataaaac 1920
 tgcaatcgcc tcgccc aaat tcaagacaat aagattctcc aagttgtgga tgggagcata 1980
 aaggataagg agctagaaca ggatatgcag gcgttgggtga agttagtgt tcaagaaaat 2040
 ggcggcgcgc tagacagaaa catcagacac acgtttttgt cggtttccaa gactttctac 2100
 tacgatgcct accacgacga tgagacgacc gatcttcata tctcaaagt actctttcga 2160
 ccggttgat ga 2172

<210> 32
 <211> 38
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Primer

<400> 32
 attacatg ctgcagctac agccggaatt tcatgccg 38

<210> 33

<211> 38
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 33
attacatatg gcgcccttga ccttgagtg ccaaattcc 38

<210> 34
<211> 38
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 34
attacatatg atagctgaat tgagagtaac aagcctgg 38

<210> 35
<211> 38
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 35
attacatatg atagctgaat tgagagtaac aagcctgg 38

<210> 36
<211> 769
<212> PRT
<213> Salvia sclarea

<400> 36

Met Leu Gln Leu Gln Pro Glu Phe His Ala Glu Cys Ser Trp Leu Lys
1 5 10 15

Ser Ser Ser Lys His Ala Pro Leu Thr Leu Ser Cys Gln Ile Arg Pro
20 25 30

Lys Gln Leu Ser Gln Ile Ala Glu Leu Arg Val Thr Ser Leu Asp Ala
35 40 45

Ser Gln Ala Ser Glu Lys Asp Ile Ser Leu Val Gln Thr Pro His Lys
50 55 60

Val Glu Val Asn Glu Lys Ile Glu Glu Ser Ile Glu Tyr Val Gln Asn
65 70 75 80

Leu Leu Met Thr Ser Gly Asp Gly Arg Ile Ser Val Ser Pro Tyr Asp
85 90 95

Thr Ala Val Ile Ala Leu Ile Lys Asp Leu Lys Gly Arg Asp Ala Pro
100 105 110

Gln Phe Pro Ser Cys Leu Glu Trp Ile Ala His His Gln Leu Ala Asp
115 120 125

Gly Ser Trp Gly Asp Glu Phe Phe Cys Ile Tyr Asp Arg Ile Leu Asn
130 135 140

Thr Leu Ala Cys Val Val Ala Leu Lys Ser Trp Asn Leu His Ser Asp
145 150 155 160

Ile Ile Glu Lys Gly Val Thr Tyr Ile Lys Glu Asn Val His Lys Leu
165 170 175

Lys Gly Ala Asn Val Glu His Arg Thr Ala Gly Phe Glu Leu Val Val
180 185 190

Pro Thr Phe Met Gln Met Ala Thr Asp Leu Gly Ile Gln Asp Leu Pro
195 200 205

Tyr Asp His Pro Leu Ile Lys Glu Ile Ala Asp Thr Lys Gln Gln Arg
210 215 220

Leu Lys Glu Ile Pro Lys Asp Leu Val Tyr Gln Met Pro Thr Asn Leu
225 230 235 240

Leu Tyr Ser Leu Glu Gly Leu Gly Asp Leu Glu Trp Glu Arg Leu Leu
245 250 255

Lys Leu Gln Ser Gly Asn Gly Ser Phe Leu Thr Ser Pro Ser Ser Thr
260 265 270

Ala Ala Val Leu Met His Thr Lys Asp Glu Lys Cys Leu Lys Tyr Ile
275 280 285

Glu Asn Ala Leu Lys Asn Cys Asp Gly Gly Ala Pro His Thr Tyr Pro
290 295 300

Val Asp Ile Phe Ser Arg Leu Trp Ala Ile Asp Arg Leu Gln Arg Leu
305 310 315 320

Gly Ile Ser Arg Phe Phe Gln His Glu Ile Lys Tyr Phe Leu Asp His
325 330 335

Ile Glu Ser Val Trp Glu Glu Thr Gly Val Phe Ser Gly Arg Tyr Thr
340 345 350

Lys Phe Ser Asp Ile Asp Asp Thr Ser Met Gly Val Arg Leu Leu Lys
355 360 365

Met His Gly Tyr Asp Val Asp Pro Asn Val Leu Lys His Phe Lys Gln
370 375 380

Gln Asp Gly Lys Phe Ser Cys Tyr Ile Gly Gln Ser Val Glu Ser Ala
385 390 395 400

Ser Pro Met Tyr Asn Leu Tyr Arg Ala Ala Gln Leu Arg Phe Pro Gly
405 410 415

Glu Glu Val Leu Glu Glu Ala Thr Lys Phe Ala Phe Asn Phe Leu Gln
420 425 430

Glu Met Leu Val Lys Asp Arg Leu Gln Glu Arg Trp Val Ile Ser Asp
435 440 445

His Leu Phe Asp Glu Ile Lys Leu Gly Leu Lys Met Pro Trp Tyr Ala
450 455 460

Thr Leu Pro Arg Val Glu Ala Ala Tyr Tyr Leu Asp His Tyr Ala Gly
465 470 475 480

Ser Gly Asp Val Trp Ile Gly Lys Ser Phe Tyr Arg Met Pro Glu Ile
485 490 495

Ser Asn Asp Thr Tyr Lys Glu Leu Ala Ile Leu Asp Phe Asn Arg Cys
500 505 510

Gln Thr Gln His Gln Leu Glu Trp Ile His Met Gln Glu Trp Tyr Asp
515 520 525

Arg Cys Ser Leu Ser Glu Phe Gly Ile Ser Lys Arg Glu Leu Leu Arg
530 535 540

Ser Tyr Phe Leu Ala Ala Ala Thr Ile Phe Glu Pro Glu Arg Thr Gln
545 550 555 560

Glu Arg Leu Leu Trp Ala Lys Thr Arg Ile Leu Ser Lys Met Ile Thr
565 570 575

Ser Phe Val Asn Ile Ser Gly Thr Thr Leu Ser Leu Asp Tyr Asn Phe
580 585 590

Asn Gly Leu Asp Glu Ile Ile Ser Ser Ala Asn Glu Asp Gln Gly Leu
595 600 605

Ala Gly Thr Leu Leu Ala Thr Phe His Gln Leu Leu Asp Gly Phe Asp
610 615 620

Ile Tyr Thr Leu His Gln Leu Lys His Val Trp Ser Gln Trp Phe Met
625 630 635 640

Lys Val Gln Gln Gly Glu Gly Ser Gly Gly Glu Asp Ala Val Leu Leu
645 650 655

Ala Asn Thr Leu Asn Ile Cys Ala Gly Leu Asn Glu Asp Val Leu Ser
660 665 670

Asn Asn Glu Tyr Thr Ala Leu Ser Thr Leu Thr Asn Lys Ile Cys Asn
675 680 685

Arg Leu Ala Gln Ile Gln Asp Asn Lys Ile Leu Gln Val Val Asp Gly
690 695 700

Ser Ile Lys Asp Lys Glu Leu Glu Gln Asp Met Gln Ala Leu Val Lys
705 710 715 720

Leu Val Leu Gln Glu Asn Gly Gly Ala Val Asp Arg Asn Ile Arg His
725 730 735

Thr Phe Leu Ser Val Ser Lys Thr Phe Tyr Tyr Asp Ala Tyr His Asp
740 745 750

Asp Glu Thr Thr Asp Leu His Ile Phe Lys Val Leu Phe Arg Pro Val
755 760 765

Val

<210> 37

<211> 750

<212> PRT

<213> Salvia sclarea

<400> 37

Met His Ala Pro Leu Thr Leu Ser Cys Gln Ile Arg Pro Lys Gln Leu
1 5 10 15

Ser Gln Ile Ala Glu Leu Arg Val Thr Ser Leu Asp Ala Ser Gln Ala
20 25 30

Ser Glu Lys Asp Ile Ser Leu Val Gln Thr Pro His Lys Val Glu Val
35 40 45

Asn Glu Lys Ile Glu Glu Ser Ile Glu Tyr Val Gln Asn Leu Leu Met
50 55 60

Thr Ser Gly Asp Gly Arg Ile Ser Val Ser Pro Tyr Asp Thr Ala Val
65 70 75 80

Ile Ala Leu Ile Lys Asp Leu Lys Gly Arg Asp Ala Pro Gln Phe Pro
85 90 95

Ser Cys Leu Glu Trp Ile Ala His His Gln Leu Ala Asp Gly Ser Trp
100 105 110

Gly Asp Glu Phe Phe Cys Ile Tyr Asp Arg Ile Leu Asn Thr Leu Ala
115 120 125

Cys Val Val Ala Leu Lys Ser Trp Asn Leu His Ser Asp Ile Ile Glu
130 135 140

Lys Gly Val Thr Tyr Ile Lys Glu Asn Val His Lys Leu Lys Gly Ala
145 150 155 160

Asn Val Glu His Arg Thr Ala Gly Phe Glu Leu Val Val Pro Thr Phe
165 170 175

Met Gln Met Ala Thr Asp Leu Gly Ile Gln Asp Leu Pro Tyr Asp His
180 185 190

Pro Leu Ile Lys Glu Ile Ala Asp Thr Lys Gln Gln Arg Leu Lys Glu
195 200 205

Ile Pro Lys Asp Leu Val Tyr Gln Met Pro Thr Asn Leu Leu Tyr Ser
210 215 220

Leu Glu Gly Leu Gly Asp Leu Glu Trp Glu Arg Leu Leu Lys Leu Gln
225 230 235 240

Ser Gly Asn Gly Ser Phe Leu Thr Ser Pro Ser Ser Thr Ala Ala Val
245 250 255

Leu Met His Thr Lys Asp Glu Lys Cys Leu Lys Tyr Ile Glu Asn Ala
260 265 270

Leu Lys Asn Cys Asp Gly Gly Ala Pro His Thr Tyr Pro Val Asp Ile
275 280 285

Phe Ser Arg Leu Trp Ala Ile Asp Arg Leu Gln Arg Leu Gly Ile Ser
290 295 300

Arg Phe Phe Gln His Glu Ile Lys Tyr Phe Leu Asp His Ile Glu Ser
305 310 315 320

Val Trp Glu Glu Thr Gly Val Phe Ser Gly Arg Tyr Thr Lys Phe Ser
325 330 335

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

Tyr Asp Val Asp Pro Asn Val Leu Lys His Phe Lys Gln Gln Asp Gly
355 360 365

Lys Phe Ser Cys Tyr Ile Gly Gln Ser Val Glu Ser Ala Ser Pro Met
370 375 380

Tyr Asn Leu Tyr Arg Ala Ala Gln Leu Arg Phe Pro Gly Glu Glu Val
385 390 395 400

Leu Glu Glu Ala Thr Lys Phe Ala Phe Asn Phe Leu Gln Glu Met Leu
405 410 415

Val Lys Asp Arg Leu Gln Glu Arg Trp Val Ile Ser Asp His Leu Phe
420 425 430

Asp Glu Ile Lys Leu Gly Leu Lys Met Pro Trp Tyr Ala Thr Leu Pro
435 440 445

Arg Val Glu Ala Ala Tyr Tyr Leu Asp His Tyr Ala Gly Ser Gly Asp
450 455 460

Val Trp Ile Gly Lys Ser Phe Tyr Arg Met Pro Glu Ile Ser Asn Asp
465 470 475 480

Thr Tyr Lys Glu Leu Ala Ile Leu Asp Phe Asn Arg Cys Gln Thr Gln
485 490 495

His Gln Leu Glu Trp Ile His Met Gln Glu Trp Tyr Asp Arg Cys Ser
500 505 510

Leu Ser Glu Phe Gly Ile Ser Lys Arg Glu Leu Leu Arg Ser Tyr Phe
515 520 525

Leu Ala Ala Ala Thr Ile Phe Glu Pro Glu Arg Thr Gln Glu Arg Leu
530 535 540

Leu Trp Ala Lys Thr Arg Ile Leu Ser Lys Met Ile Thr Ser Phe Val
545 550 555 560

Asn Ile Ser Gly Thr Thr Leu Ser Leu Asp Tyr Asn Phe Asn Gly Leu
565 570 575

Asp Glu Ile Ile Ser Ser Ala Asn Glu Asp Gln Gly Leu Ala Gly Thr
580 585 590

Leu Leu Ala Thr Phe His Gln Leu Leu Asp Gly Phe Asp Ile Tyr Thr
595 600 605

Leu His Gln Leu Lys His Val Trp Ser Gln Trp Phe Met Lys Val Gln
610 615 620

Gln Gly Glu Gly Ser Gly Gly Glu Asp Ala Val Leu Leu Ala Asn Thr
625 630 635 640

Leu Asn Ile Cys Ala Gly Leu Asn Glu Asp Val Leu Ser Asn Asn Glu
645 650 655

Tyr Thr Ala Leu Ser Thr Leu Thr Asn Lys Ile Cys Asn Arg Leu Ala
660 665 670

Gln Ile Gln Asp Asn Lys Ile Leu Gln Val Val Asp Gly Ser Ile Lys
675 680 685

Asp Lys Glu Leu Glu Gln Asp Met Gln Ala Leu Val Lys Leu Val Leu
690 695 700

Gln Glu Asn Gly Gly Ala Val Asp Arg Asn Ile Arg His Thr Phe Leu
705 710 715 720

Ser Val Ser Lys Thr Phe Tyr Tyr Asp Ala Tyr His Asp Asp Glu Thr
725 730 735

Thr Asp Leu His Ile Phe Lys Val Leu Phe Arg Pro Val Val
740 745 750

<210> 38
<211> 733
<212> PRT
<213> Salvia sclarea

<400> 38

Met Ile Ala Glu Leu Arg Val Thr Ser Leu Asp Ala Ser Gln Ala Ser
1 5 10 15

Glu Lys Asp Ile Ser Leu Val Gln Thr Pro His Lys Val Glu Val Asn
20 25 30

Glu Lys Ile Glu Glu Ser Ile Glu Tyr Val Gln Asn Leu Leu Met Thr
35 40 45

Ser Gly Asp Gly Arg Ile Ser Val Ser Pro Tyr Asp Thr Ala Val Ile
50 55 60

Ala Leu Ile Lys Asp Leu Lys Gly Arg Asp Ala Pro Gln Phe Pro Ser
65 70 75 80

Cys Leu Glu Trp Ile Ala His His Gln Leu Ala Asp Gly Ser Trp Gly
85 90 95

Asp Glu Phe Phe Cys Ile Tyr Asp Arg Ile Leu Asn Thr Leu Ala Cys
100 105 110

Val Val Ala Leu Lys Ser Trp Asn Leu His Ser Asp Ile Ile Glu Lys
115 120 125

Gly Val Thr Tyr Ile Lys Glu Asn Val His Lys Leu Lys Gly Ala Asn
130 135 140

Val Glu His Arg Thr Ala Gly Phe Glu Leu Val Val Pro Thr Phe Met
145 150 155 160

Gln Met Ala Thr Asp Leu Gly Ile Gln Asp Leu Pro Tyr Asp His Pro
165 170 175

Leu Ile Lys Glu Ile Ala Asp Thr Lys Gln Gln Arg Leu Lys Glu Ile
180 185 190

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

Glu Gly Leu Gly Asp Leu Glu Trp Glu Arg Leu Leu Lys Leu Gln Ser
210 215 220

Gly Asn Gly Ser Phe Leu Thr Ser Pro Ser Ser Thr Ala Ala Val Leu
225 230 235 240

Met His Thr Lys Asp Glu Lys Cys Leu Lys Tyr Ile Glu Asn Ala Leu
245 250 255

Lys Asn Cys Asp Gly Gly Ala Pro His Thr Tyr Pro Val Asp Ile Phe
260 265 270

Ser Arg Leu Trp Ala Ile Asp Arg Leu Gln Arg Leu Gly Ile Ser Arg
275 280 285

Phe Phe Gln His Glu Ile Lys Tyr Phe Leu Asp His Ile Glu Ser Val
290 295 300

Trp Glu Glu Thr Gly Val Phe Ser Gly Arg Tyr Thr Lys Phe Ser Asp
305 310 315 320

Ile Asp Asp Thr Ser Met Gly Val Arg Leu Leu Lys Met His Gly Tyr
325 330 335

Asp Val Asp Pro Asn Val Leu Lys His Phe Lys Gln Gln Asp Gly Lys
340 345 350

Phe Ser Cys Tyr Ile Gly Gln Ser Val Glu Ser Ala Ser Pro Met Tyr
355 360 365

Asn Leu Tyr Arg Ala Ala Gln Leu Arg Phe Pro Gly Glu Glu Val Leu
370 375 380

Glu Glu Ala Thr Lys Phe Ala Phe Asn Phe Leu Gln Glu Met Leu Val
385 390 395 400

Lys Asp Arg Leu Gln Glu Arg Trp Val Ile Ser Asp His Leu Phe Asp
405 410 415

Glu Ile Lys Leu Gly Leu Lys Met Pro Trp Tyr Ala Thr Leu Pro Arg
420 425 430

Val Glu Ala Ala Tyr Tyr Leu Asp His Tyr Ala Gly Ser Gly Asp Val
435 440 445

Trp Ile Gly Lys Ser Phe Tyr Arg Met Pro Glu Ile Ser Asn Asp Thr
450 455 460

Tyr Lys Glu Leu Ala Ile Leu Asp Phe Asn Arg Cys Gln Thr Gln His
465 470 475 480

Gln Leu Glu Trp Ile His Met Gln Glu Trp Tyr Asp Arg Cys Ser Leu
485 490 495

Ser Glu Phe Gly Ile Ser Lys Arg Glu Leu Leu Arg Ser Tyr Phe Leu
500 505 510

Ala Ala Ala Thr Ile Phe Glu Pro Glu Arg Thr Gln Glu Arg Leu Leu
515 520 525

Trp Ala Lys Thr Arg Ile Leu Ser Lys Met Ile Thr Ser Phe Val Asn
530 535 540

Ile Ser Gly Thr Thr Leu Ser Leu Asp Tyr Asn Phe Asn Gly Leu Asp
545 550 555 560

Glu Ile Ile Ser Ser Ala Asn Glu Asp Gln Gly Leu Ala Gly Thr Leu
 565 570 575

Leu Ala Thr Phe His Gln Leu Leu Asp Gly Phe Asp Ile Tyr Thr Leu
 580 585 590

His Gln Leu Lys His Val Trp Ser Gln Trp Phe Met Lys Val Gln Gln
 595 600 605

Gly Glu Gly Ser Gly Gly Glu Asp Ala Val Leu Leu Ala Asn Thr Leu
 610 615 620

Asn Ile Cys Ala Gly Leu Asn Glu Asp Val Leu Ser Asn Asn Glu Tyr
625 630 635 640

Thr Ala Leu Ser Thr Leu Thr Asn Lys Ile Cys Asn Arg Leu Ala Gln
 645 650 655

Ile Gln Asp Asn Lys Ile Leu Gln Val Val Asp Gly Ser Ile Lys Asp
 660 665 670

Lys Glu Leu Glu Gln Asp Met Gln Ala Leu Val Lys Leu Val Leu Gln
 675 680 685

Glu Asn Gly Gly Ala Val Asp Arg Asn Ile Arg His Thr Phe Leu Ser
 690 695 700

Val Ser Lys Thr Phe Tyr Tyr Asp Ala Tyr His Asp Asp Glu Thr Thr
705 710 715 720

Asp Leu His Ile Phe Lys Val Leu Phe Arg Pro Val Val
 725 730

<210> 39
<211> 723
<212> PRT
<213> Salvia sclarea

<400> 39

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

His Lys Val Glu Val Asn Glu Lys Ile Glu Glu Ser Ile Glu Tyr Val
20 25 30

Gln Asn Leu Leu Met Thr Ser Gly Asp Gly Arg Ile Ser Val Ser Pro
35 40 45

Tyr Asp Thr Ala Val Ile Ala Leu Ile Lys Asp Leu Lys Gly Arg Asp
50 55 60

Ala Pro Gln Phe Pro Ser Cys Leu Glu Trp Ile Ala His His Gln Leu
65 70 75 80

Ala Asp Gly Ser Trp Gly Asp Glu Phe Phe Cys Ile Tyr Asp Arg Ile
85 90 95

Leu Asn Thr Leu Ala Cys Val Val Ala Leu Lys Ser Trp Asn Leu His
100 105 110

Ser Asp Ile Ile Glu Lys Gly Val Thr Tyr Ile Lys Glu Asn Val His
115 120 125

Lys Leu Lys Gly Ala Asn Val Glu His Arg Thr Ala Gly Phe Glu Leu
130 135 140

Val Val Pro Thr Phe Met Gln Met Ala Thr Asp Leu Gly Ile Gln Asp
145 150 155 160

Leu Pro Tyr Asp His Pro Leu Ile Lys Glu Ile Ala Asp Thr Lys Gln

165 170 175

Gln Arg Leu Lys Glu Ile Pro Lys Asp Leu Val Tyr Gln Met Pro Thr
180 185 190

Asn Leu Leu Tyr Ser Leu Glu Gly Leu Gly Asp Leu Glu Trp Glu Arg
195 200 205

Leu Leu Lys Leu Gln Ser Gly Asn Gly Ser Phe Leu Thr Ser Pro Ser
210 215 220

Ser Thr Ala Ala Val Leu Met His Thr Lys Asp Glu Lys Cys Leu Lys
225 230 235 240

Tyr Ile Glu Asn Ala Leu Lys Asn Cys Asp Gly Gly Ala Pro His Thr
245 250 255

Tyr Pro Val Asp Ile Phe Ser Arg Leu Trp Ala Ile Asp Arg Leu Gln
260 265 270

Arg Leu Gly Ile Ser Arg Phe Phe Gln His Glu Ile Lys Tyr Phe Leu
275 280 285

Asp His Ile Glu Ser Val Trp Glu Glu Thr Gly Val Phe Ser Gly Arg
290 295 300

Tyr Thr Lys Phe Ser Asp Ile Asp Asp Thr Ser Met Gly Val Arg Leu
305 310 315 320

Leu Lys Met His Gly Tyr Asp Val Asp Pro Asn Val Leu Lys His Phe
325 330 335

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

Ser Ala Ser Pro Met Tyr Asn Leu Tyr Arg Ala Ala Gln Leu Arg Phe

355

360

365

Pro Gly Glu Glu Val Leu Glu Glu Ala Thr Lys Phe Ala Phe Asn Phe
 370 375 380

Leu Gln Glu Met Leu Val Lys Asp Arg Leu Gln Glu Arg Trp Val Ile
 385 390 395 400

Ser Asp His Leu Phe Asp Glu Ile Lys Leu Gly Leu Lys Met Pro Trp
 405 410 415

Tyr Ala Thr Leu Pro Arg Val Glu Ala Ala Tyr Tyr Leu Asp His Tyr
 420 425 430

Ala Gly Ser Gly Asp Val Trp Ile Gly Lys Ser Phe Tyr Arg Met Pro
 435 440 445

Glu Ile Ser Asn Asp Thr Tyr Lys Glu Leu Ala Ile Leu Asp Phe Asn
 450 455 460

Arg Cys Gln Thr Gln His Gln Leu Glu Trp Ile His Met Gln Glu Trp
 465 470 475 480

Tyr Asp Arg Cys Ser Leu Ser Glu Phe Gly Ile Ser Lys Arg Glu Leu
 485 490 495

Leu Arg Ser Tyr Phe Leu Ala Ala Ala Thr Ile Phe Glu Pro Glu Arg
 500 505 510

Thr Gln Glu Arg Leu Leu Trp Ala Lys Thr Arg Ile Leu Ser Lys Met
 515 520 525

Ile Thr Ser Phe Val Asn Ile Ser Gly Thr Thr Leu Ser Leu Asp Tyr
 530 535 540

Asn Phe Asn Gly Leu Asp Glu Ile Ile Ser Ser Ala Asn Glu Asp Gln

545 550 555 560

Gly Leu Ala Gly Thr Leu Leu Ala Thr Phe His Gln Leu Leu Asp Gly
 565 570 575

Phe Asp Ile Tyr Thr Leu His Gln Leu Lys His Val Trp Ser Gln Trp
 580 585 590

Phe Met Lys Val Gln Gln Gly Glu Gly Ser Gly Gly Glu Asp Ala Val
 595 600 605

Leu Leu Ala Asn Thr Leu Asn Ile Cys Ala Gly Leu Asn Glu Asp Val
 610 615 620

Leu Ser Asn Asn Glu Tyr Thr Ala Leu Ser Thr Leu Thr Asn Lys Ile
625 630 635 640

Cys Asn Arg Leu Ala Gln Ile Gln Asp Asn Lys Ile Leu Gln Val Val
 645 650 655

Asp Gly Ser Ile Lys Asp Lys Glu Leu Glu Gln Asp Met Gln Ala Leu
 660 665 670

Val Lys Leu Val Leu Gln Glu Asn Gly Gly Ala Val Asp Arg Asn Ile
 675 680 685

Arg His Thr Phe Leu Ser Val Ser Lys Thr Phe Tyr Tyr Asp Ala Tyr
 690 695 700

His Asp Asp Glu Thr Thr Asp Leu His Ile Phe Lys Val Leu Phe Arg
705 710 715 720

Pro Val Val

<210> 40

<211> 81
<212> DNA
<213> Salvia sclarea

<400> 40
ctgatgttct tgtctacggc gccgccattt tcttgaagca ctaactcac caacgcctgc 60
atctcctgtt ctgctcctt a 81

<210> 41
<211> 73
<212> DNA
<213> Salvia sclarea

<400> 41
attcctgcat atggatccac tccaactgat gttgtgttg gcatctgttg aaatccaata 60
tcgcaagctc ctt 73

<210> 42
<211> 52
<212> DNA
<213> Salvia sclarea

<400> 42
tattattgaa aaaggagtga cgtacatcaa ggagaatgtg cataaactta aa 52

<210> 43
<211> 857
<212> DNA
<213> Salvia sclarea

<400> 43
atgtcaccac aaacagagac taaagcaagt gttggattca aagcgggtgt taaagagtac 60
aaattgactt attatactcc tgaatacgaa accaaagata ctgatatctt ggcagcattc 120
cgagtaactc ctcaaccggg agttccgcct gaagaagcag gggccgcggt agctgccgaa 180
tcttctactg gtacatggac aactgtgttg accgatggac ttaccagcct tgatcgttac 240
aaagggcgat gctaccacat tgagcccgtt cctggagaaa aagatcaata tatctgttat 300
gtagcttacc ctttagacct ttgtgaagaa ggttctgtta ctaacatgtt tacttccatt 360

gtaggaaatg tatttggatt caaagcccta cgtgctctac gtctggaaga tctgcgaatt 420
 cctgttgctt atgttaaaac ttccaaggc cgcctcatg ggatccaagt tgagagagat 480
 aaattgaaca agtacggtcg tcctctgctg ggatgtacta ttaaacctaa attgggggta 540
 tctgctaaaa actatggtag agcggttat gaatgtctc gcggtggact tgattttacc 600
 aaagatgatg agaacgtgaa ctcccagcca ttatgcggtt ggagagaccg cttcttatt 660
 tgtgccgaag caatttataa agcacaggct gaaacagggtg aatcaaagg gcattacttg 720
 aatgctactg cgggtacatg cgaagagatg atgaaaagag ctatatttgc tagagaattg 780
 ggagttccta tcgtaatgca cgactactta acaggaggat tcaccgcaa taccagttg 840
 gctcattatt gccgaga 857

<210> 44
 <211> 540
 <212> DNA
 <213> *Salvia sclarea*

<400> 44
 aaagtatcca ctgctttaa ttcaaactg atttcttcc atacctcaca agcggcagct 60
 agttcaggac tccatttga agcttcacgg ataattgcat taccttcagc agcaagatca 120
 cgtccttcat tacgagcttt tacacacgct tctacagcta ctcggttagc tacagcacct 180
 ggtgcattac cccaaggggtg tcctaaagtt cctccaccga actgtagtac ggaatcgtct 240
 ccaaagatct cggtcagagc aggcatatgc caaacgtgaa taccctctga agccacagga 300
 ataacacccg gcagggagac ccaatcttga gtgaaataaa taccgcgact tcggtctttt 360
 tcaataaaat catcacgcag taaatcaaca aaacctaaag taatgtctct ctctccttca 420
 agtttaccta ctacgggtacc agagtgaata tgatctccac cggacagacg taacgcttta 480
 gctagtacac ggaagtgcac accgtgattc ttctgtctat caataactgc atgcattgca 540

<210> 45
 <211> 60
 <212> DNA
 <213> *Salvia sclarea*

<400> 45
atgttcgtct cgcattgcc aaaacatctg tgcttgaac aattatggat gatttttcg 60

<210> 46
<211> 35
<212> DNA
<213> Salvia sclarea

<400> 46
cttctacctt ggcttgcatt ctgctctta aaaaa 35

<210> 47
<211> 35
<212> DNA
<213> Salvia sclarea

<400> 47
aaaaaaaaata tgatctaaaa aatggatcag tttaa 35

<210> 48
<211> 72
<212> DNA
<213> Salvia sclarea

<400> 48
actactcatg caatggcatt taggcttttg cgagtgaag gatacgaagt tcatcagag 60
gagttggcct ca 72

<210> 49
<211> 35
<212> DNA
<213> Salvia sclarea

<400> 49
gcaactgatg atttgtgga tgtgggggc agctc 35

<210> 50
<211> 35
<212> DNA
<213> Salvia sclarea

<400> 50
gccaaaataa ttccttgcac gcccttgga ggaga 35

<210> 51
<211> 11
<212> PRT
<213> Salvia sclarea

<400> 51
Ser Thr Leu Ala Cys Ile Leu Ala Leu Lys Lys
1 5 10

<210> 52
<211> 10
<212> PRT
<213> Salvia sclarea

<400> 52
Lys Lys Tyr Asp Leu Lys Asn Gly Ser Val
1 5 10

<210> 53
<211> 24
<212> PRT
<213> Salvia sclarea

<400> 53
Thr Thr His Ala Met Ala Phe Arg Leu Leu Arg Val Lys Gly Tyr Glu
1 5 10 15

Val Ser Ser Glu Glu Leu Ala Ser
20

<210> 54
<211> 11
<212> PRT
<213> Salvia sclarea

<400> 54

Ala Thr Asp Asp Phe Val Asp Val Gly Gly Ser
1 5 10

<210> 55
<211> 11
<212> PRT
<213> Salvia sclarea

<400> 55

Leu Leu Pro Lys Pro Cys Lys Glu Leu Phe Trp
1 5 10

<210> 56
<211> 27
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 56
cttctacctt ggctgcatt cttgctc

27

<210> 57
<211> 31
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 57
ctactcatgc aatggcattt aggcttttgc g

31

<210> 58
<211> 33
<212> DNA
<213> Salvia sclarea

<400> 58
gtgaaaggat acgaagtttc atcagaggag ttg

33

<210> 59
<211> 32
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 59
gaggccaact cctctgatga aacttcgtat cc 32

<210> 60
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 60
cactcgcaaa agcctaaatg ccattgcatg 30

<210> 61
<211> 36
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 61
cctatagtgt caaaagacaa aggatttc atcttc 36

<210> 62
<211> 31
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 62
gcttattgag aaagatggta gtccaagcaa g 31

<210> 63
<211> 32
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 63
gctctataaa gctcaataat catcggcagg tc 32

<210> 64
<211> 23
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 64
caccatgtcg ctgccttca acg 23

<210> 65
<211> 33
<212> DNA
<213> Artificial sequence

<220>
<223> Primer

<400> 65
caccatggcg aaaatgaaag agaattcaa gag 33

<210> 66
<211> 547
<212> DNA
<213> Salvia sclarea

<400> 66
agcggccgct gaattctaga atttgatgt ggaatagaat tgacgaatgg cgtgcaagcg 60

cgctctctc ctctctctc tctctagaaa atatgattgt gcagttgagt tggcaaaagc 120

glatctgatt cctgccctt gctaacttc ccaaatttg tcccgttta ttccataggg 180

gatttttca aggccgcat gtcgttct ctctccact gcaatggatc acattttcg 240
agataccgct tgttctctgc ttacagcagct tctatggaaa ctgggcttca aactgctact 300
tcagcaaaaa tcgcctctat gccagcgtgc ttgaggaga cgagagggag gatagcaaaag 360
ttgtttcata aggatgaact ttctgtgtcg acatatgata cagcatgggt tgccatggtc 420
ccttctccaa cttcgtaga ggaaccttgc ttccccgatt gtctaaactg gttgctcgag 480
aaccagtgcc atgatgggtc gtgggcccg cccaccatc actctttgct aatgaaagat 540
gtccttt 547

<210> 67
<211> 1473
<212> DNA
<213> Salvia sclarea

<400> 67
ctccatatgg taaccaagag gctgttagcc agcaaacaaa tgacctgccg atgattattg 60
agctttatag agcagcaaat gagagaatat atgaagaaga gaggagtctt gaaaaaattc 120
ttgcttgac taccatcttt ctcaataagc aagtgaaga taactcaatt cccgacaaaa 180
aactgcacaa actgggtggaa ttctactga ggaattacaa aggcataacc ataagattgg 240
gagctagacg aaacctcgag ctatatgaca tgacctacta tcaagctctg aaatctacaa 300
acaggttctc taatttatgc aacgaagatt ttctagttt cgcaaagcaa gatttcgata 360
tacetgaagc ccagaaccag aaaggacttc aacaactgca aagggtggtat gcagattgta 420
gggtggacac cttaaacttt ggaagagatg tagttattat tgctaattat ttggcttcat 480
taattattgg tgatcatgcg ttgactatg ttctgtctgc atttgccaaa acatctgtgc 540
ttgtaacaat tatggatgat ttttcgact gtcattggctc tagtcaagag tggacaaga 600
tcattgaatt agtaaaagaa tggaaggaga atccggatgc agagtacgga tctgaggagc 660
ttgagatcct tttatggcg ttgtacaata cagtaaatga gtggcgagg agggctctgt 720
ttgaacaggg gcgtagtgtc aaagagtttc tagtcaaact gtgggttgaa atactctcag 780
ctttcaagat agaattagat acatggagca atggcacgca gcaaagcttc gatgaataca 840

ttcttcgtc gtggtgtcg aacggtccc ggctgacagg tctcctgacg atgcaattcg 900
 tcggagtaaa attgtccgat gaaatgctta tgagtgaaga gtgcactgat ttggctaggc 960
 atgtctgtat ggtcggccgg ctgctcaacg acgtgtgcag ttctgagagg gagcgcgagg 1020
 aaaatattgc aggaaaaagt tatagcattc tactagcaac tgagaaagat ggaagaaaag 1080
 ttagtgaaga tgaagccatt gcagagatca atgaaatggt tgaatatcac tggagaaaag 1140
 tgttcagat tgtgtataaa aaagaaagca tttgccaag aagatgcaa gatgtat 1200
 tggagatggc taagggtacg tttatgctt atgggatcaa cgatgaattg acttctctc 1260
 agcaatccaa ggaagatatg aaatccttg tctttgaca ctataggctc gtttggtacg 1320
 ggtgatatta ggggtgttaa tacaattatg acactgtaat attttattt gtacaaaaca 1380
 cgtggttctt tgcatatcaa aaattgaaa atgttataag gatttgtatc cactataaga 1440
 aattgttga taaaaaaaaa aaaaaaaaaa aaa 1473

<210> 68
 <211> 464
 <212> DNA
 <213> Salvia sclarea

<400> 68
 aaattaatta ggaataaaaa aaattggact ttatattat tagaaacggc cgccgccgca 60
 aaaaaatgtc gctcgccttc aacgtcggag ttacgccttt ctccggccaa agagttggga 120
 gcaggaaaga aaaattcca gtccaaggat ttctgtgac ccccccaat aggtcacgtc 180
 tcatcgtaa ctgcagcctt actacaatag attcatggc gaaaatgaaa gagaattca 240
 agaggaaga cgataaattt ccaacgacaa cgactcttcg atccgaagat ataccctcta 300
 atttgtgtat aatcgacacc ctcaaagggt tgggggtcga tcaattctc caatatgaaa 360
 tcaacactat ttagataac acattcaggt tgtggcaaga aaaacacaaa gttatatatg 420
 gcaatgttac tactcatgca atggcattta ggcttttgcg agtg 464

<210> 69

<211> 536
<212> DNA
<213> Salvia sclarea

<400> 69
aaattaatta ggaataaaaa aaattggact ttatattat tagaaacggc cgccgccgca 60
aaaaaatgtc gctgccttc aacgtcggag ttacgcctt ctccggccaa agagttggga 120
gcaggaaaga aaaattcca gtccaaggat ttctgtgac caccccaat aggtcacgtc 180
tcatcgtaa ctgcagcctt actacaatag attcatggc gaaaatgaaa gagaattca 240
agagggaaga cgataaattt ccaacgacaa cgactcttcg atccgaagat atacctcta 300
atttgttat aatcgacacc ctcaaagggt tgggggtcga tcaattctc caatatgaaa 360
tcaacactat ttagataac acattcaggt tgtggcaaga aaaacacaaa gttatatatg 420
gcaatgttac tactcatgca atggcattta ggcttttgcg agtgaaagga tacgaagttt 480
catcagagga gttggctcca tatggaacc aagaggctgt tagccagcaa acaaat 536

<210> 70
<211> 95
<212> DNA
<213> Salvia sclarea

<400> 70
ttgcatcttc ttggcaaat gcttcttt ttatacaca tctgcaacac tttctccag 60
tgatattcaa ccatttcatt gatctctgca atggc 95

<210> 71
<211> 55
<212> DNA
<213> Salvia sclarea

<400> 71
tgaagcccag aaccagaaag gactcaaca actgcaaagg tggtatgcag attgt 55

<210> 72
<211> 53
<212> DNA
<213> Salvia sclarea

<400> 72

tactctgcat ccgattctc ctccattct ttactaatt caatgatctt gtc 53

<210> 73

<211> 1578

<212> DNA

<213> Salvia sclarea

<400> 73

atggcgaaaa tgaaagagaa ttcaagagg gaagacgata aattccaac gacaacgact 60

cttcgatccg aagatatacc ctctaattg tgtataatcg acaccctca aagggtgggg 120

gtcgaatcaat tctccaata tgaaatcaac actattctag ataacacatt caggttgttg 180

caagaaaaac acaaagttat atatggcaat gttactactc atgcaatggc atttaggctt 240

ttgcgagtga aaggatacga agtttcatca gaggagtgg ctccatatgg taaccaagag 300

gctgttagcc agcaaacaaa tgacctgccg atgattattg agctttatag agcagcaaat 360

gagagaatat atgaagaaga gaggagtctt gaaaaaattc ttgcttggac taccatcttt 420

ctcaataagc aagtgaaga taactcaatt cccgacaaaa aactgcacaa actggtggaa 480

tttacttga ggaattacaa aggcataacc ataagattgg gagctagacg aaacctcgag 540

ctatatgaca tgacctacta tcaagctctg aaatctacaa acaggttctc taatttatgc 600

aacgaagatt tctagtctt cgcaaagcaa gatttcgata tacatgaagc ccagaaccag 660

aaaggacttc aacaactgca aagggtggtat gcagattgta ggttggacac cttaaacttt 720

ggaagagatg tagttattat tgctaattat ttggcttcat taattattgg tgatcatgcg 780

tttgactatg ttctctcgc atttgccaaa acatctgtgc ttgtaacaat tatggatgat 840

ttttcgact gtcattggctc tagtcaagag tgtgacaaga tcattgaatt agtaaaagaa 900

tggaaggaga atccggatgc agagtacgga tctgaggagc ttgagatcct tttatggcg 960

ttgtacaata cagtaaatga gtggcgagg agggctcgtg ttgaacaggg gcgtagtctc 1020

aaagagtctc tagtcaaact gtgggttgaa atactctcag ctttcaagat agaattagat 1080

acatggagca atggcacgca gcaaagcttc gatgaataca ttcttcgtc gtggtgtgc 1140

aaccgttccc ggctgacagg tctcctgacg atgcaattcg tcggagtaaa attgtccgat 1200
gaaatgctta tgagtgaaga gtgcactgat ttggctaggc atgtctgtat ggtcggccgg 1260
ctgctcaacg acgtgtgcag ttctgagagg gagcgcgagg aaaatattgc aggaaaaagt 1320
tatagcattc tactagcaac tgagaaagat ggaagaaaag ttagtgaaga tgaagccatt 1380
gcagagatca atgaaatggg tgaatatcac tggagaaaag tgttcagat tgtgtataaa 1440
aaagaaagca tttgccaaag aagatgcaaa gatgtatatt tggagatggc taagggtacg 1500
tttatgctt atgggatcaa cgatgaattg acttctctc agcaatccaa ggaagatatg 1560
aaatcctttg tcttttga 1578

<210> 74
<211> 525
<212> PRT
<213> Salvia sclarea

<400> 74

Met Ala Lys Met Lys Glu Asn Phe Lys Arg Glu Asp Asp Lys Phe Pro
1 5 10 15

Thr Thr Thr Thr Leu Arg Ser Glu Asp Ile Pro Ser Asn Leu Cys Ile
20 25 30

Ile Asp Thr Leu Gln Arg Leu Gly Val Asp Gln Phe Phe Gln Tyr Glu
35 40 45

Ile Asn Thr Ile Leu Asp Asn Thr Phe Arg Leu Trp Gln Glu Lys His
50 55 60

Lys Val Ile Tyr Gly Asn Val Thr Thr His Ala Met Ala Phe Arg Leu
65 70 75 80

Leu Arg Val Lys Gly Tyr Glu Val Ser Ser Glu Glu Leu Ala Pro Tyr
85 90 95

Gly Asn Gln Glu Ala Val Ser Gln Gln Thr Asn Asp Leu Pro Met Ile
100 105 110

Ile Glu Leu Tyr Arg Ala Ala Asn Glu Arg Ile Tyr Glu Glu Glu Arg
115 120 125

Ser Leu Glu Lys Ile Leu Ala Trp Thr Thr Ile Phe Leu Asn Lys Gln
130 135 140

Val Gln Asp Asn Ser Ile Pro Asp Lys Lys Leu His Lys Leu Val Glu
145 150 155 160

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

Arg Asn Leu Glu Leu Tyr Asp Met Thr Tyr Tyr Gln Ala Leu Lys Ser
180 185 190

Thr Asn Arg Phe Ser Asn Leu Cys Asn Glu Asp Phe Leu Val Phe Ala
195 200 205

Lys Gln Asp Phe Asp Ile His Glu Ala Gln Asn Gln Lys Gly Leu Gln
210 215 220

Gln Leu Gln Arg Trp Tyr Ala Asp Cys Arg Leu Asp Thr Leu Asn Phe
225 230 235 240

Gly Arg Asp Val Val Ile Ile Ala Asn Tyr Leu Ala Ser Leu Ile Ile
245 250 255

Gly Asp His Ala Phe Asp Tyr Val Arg Leu Ala Phe Ala Lys Thr Ser
260 265 270

Val Leu Val Thr Ile Met Asp Asp Phe Phe Asp Cys His Gly Ser Ser
275 280 285

Gln Glu Cys Asp Lys Ile Ile Glu Leu Val Lys Glu Trp Lys Glu Asn
290 295 300

Pro Asp Ala Glu Tyr Gly Ser Glu Glu Leu Glu Ile Leu Phe Met Ala
305 310 315 320

Leu Tyr Asn Thr Val Asn Glu Leu Ala Glu Arg Ala Arg Val Glu Gln
325 330 335

Gly Arg Ser Val Lys Glu Phe Leu Val Lys Leu Trp Val Glu Ile Leu
340 345 350

Ser Ala Phe Lys Ile Glu Leu Asp Thr Trp Ser Asn Gly Thr Gln Gln
355 360 365

Ser Phe Asp Glu Tyr Ile Ser Ser Ser Trp Leu Ser Asn Gly Ser Arg
370 375 380

Leu Thr Gly Leu Leu Thr Met Gln Phe Val Gly Val Lys Leu Ser Asp
385 390 395 400

Glu Met Leu Met Ser Glu Glu Cys Thr Asp Leu Ala Arg His Val Cys
405 410 415

Met Val Gly Arg Leu Leu Asn Asp Val Cys Ser Ser Glu Arg Glu Arg
420 425 430

Glu Glu Asn Ile Ala Gly Lys Ser Tyr Ser Ile Leu Leu Ala Thr Glu
435 440 445

Lys Asp Gly Arg Lys Val Ser Glu Asp Glu Ala Ile Ala Glu Ile Asn
450 455 460

Glu Met Val Glu Tyr His Trp Arg Lys Val Leu Gln Ile Val Tyr Lys
465 470 475 480

Lys Glu Ser Ile Leu Pro Arg Arg Cys Lys Asp Val Phe Leu Glu Met
 485 490 495

Ala Lys Gly Thr Phe Tyr Ala Tyr Gly Ile Asn Asp Glu Leu Thr Ser
 500 505 510

Pro Gln Gln Ser Lys Glu Asp Met Lys Ser Phe Val Phe
 515 520 525

<210> 75
 <211> 30
 <212> DNA
 <213> Artificial

<220>
 <223> Primer

<400> 75
 ctagccatgg cttcagaaaa agaaattagg 30

<210> 76
 <211> 40
 <212> DNA
 <213> Artificial

<220>
 <223> Primer

<400> 76
 ccggaattcc tatttgcttc tcttgtaaac ttgttcaag 40

<210> 77
 <211> 42
 <212> DNA
 <213> Artificial

<220>
 <223> Primer

<400> 77
 aaggagatat acatatgaca aaaaaagttg gtgtcgggtca gg 42

<210> 78
<211> 43
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 78
ctttaccaga ctcgagttac gcccttttca tctgacctt tgc 43

<210> 79
<211> 31
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 79
attaccatgg ttctgggtc gaaagcagga g 31

<210> 80
<211> 36
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 80
ttaaggatcc ttaggcgatc tcatcactg gagacc 36

<210> 81
<211> 15
<212> DNA
<213> Artificial

<220>
<223> Link between the LPP synthase and the sclareol synthase in the
nucleic acid encoding the fusion polypeptide.

<400> 81
ggtggttctg gtggt 15

<210> 82
<211> 5
<212> PRT
<213> Artificial

<220>
<223> Link between the LPP synthase and the sclareol synthase in the fusion polypeptide.

<400> 82

Gly Gly Ser Gly Gly
1 5

<210> 83
<211> 39
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 83
aaggagatat acatatggcg tcgcaagcga gtgaaaaag 39

<210> 84
<211> 40
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 84
accaccagaa ccacctacaa ccggtcgaaa gagtactttg 40

<210> 85
<211> 41
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 85
 ggtggttctg gtggtgcgaa aatgaaagag aattcaaga g 41

<210> 86
 <211> 51
 <212> DNA
 <213> Primer

<400> 86
 ttaccagact cgagggtacc ttatcaaaag acaaaggatt tcatatcttc c 51

<210> 87
 <211> 3759
 <212> DNA
 <213> Artificial

<220>
 <223> Fusion protein containing a LPP synthase and a sclareol synthase
 from Salvia sclarea

<400> 87
 atggcgtcgc aagcgagtga aaaagacatt tccctgttc aaactccgca taagggtgag 60
 gttaatgaaa agatcgagga gtcaatcgag tacgtccaaa atctgttgat gacgtcgggc 120
 gacgggcgaa taagcgtgtc accctatgac acggcagtga tcgccctgat caaggacttg 180
 aaagggcgcg acgccccgca gttccgtca tgtctcgagt ggatcgcgca ccaccaactg 240
 gctgatggct catggggcga cgaattcttc tgtatttatg atcggattct aaatacattg 300
 gcatgtgtcg tagccttgaa atcatggaac cttcactctg atattattga aaaaggagtg 360
 acgtacatca aggagaatgt gcataaactt aaagggtgcaa atgttgagca caggacagcg 420
 gggttcgaac ttgtggttcc tacttttatg caaatggcca cagatttggg catccaagat 480
 ctgccctatg atcatcccct catcaaggag attgctgaca caaaacaaca aagattgaaa 540
 gagataccca aggatttggg ttaccaaatt ccaacgaatt tactgtacag tttagaaggg 600
 ttaggagatt tggagtggga aaggctactg aaactgcagt cgggcaatgg ctcttctctc 660
 acttcgccgt cgtccaccgc cgccgtcttg atgcatacca aagatgaaaa atgtttgaaa 720

tacatcgaaa acgccctcaa gaattgcgac ggaggagcac cacatactta tccagtcgat 780
 atcttctcaa gactttgggc aatcgatagg ctacaacgcc taggaatttc tcgtttcttc 840
 cagcacgaga tcaagtattt cttagatcac atcgaaagcg ttggggagga gaccggagtt 900
 ttcagtggaa gatatacgaa atttagcgat attgatgaca cgtccatggg cgtaggctt 960
 ctcaaaatgc acggatacga cgtcgatcca aatgtactaa aacatttcaa gcaacaagat 1020
 ggtaaatTTT cctgctacat tggTcaatcg gtcgagtctg catctccaat gtacaatctt 1080
 tatagggctg ctcaactaag atttcagga gaagaagttc ttgaagaagc cactaaattt 1140
 gcctttaact tcttgcaaga aatgctagtc aaagatcgac ttcaagaaag atgggtgata 1200
 tccgaccact tatttgatga gataaagctg gggttgaaga tgccatggta cgccactcta 1260
 ccccgagtcg aggcTgcata ttatctagac cattatgctg gttctggTga tgtatggatt 1320
 ggcaagagtt tctacaggat gccagaaatc agcaatgata catacaagga gcttgcgata 1380
 ttggatttca acagatgcc aacacaacat cagttggagt ggatccacat gcaggaatgg 1440
 tacgacagat gcagccttag cgaattcggg ataagcaaaa gagagttgct tcgctcttac 1500
 ttctggccg cagcaaccat attcgaaccg gagagaactc aagagaggct tctgtgggcc 1560
 aaaaccagaa ttctttctaa gatgatcact tcatttgTca acattagtgg aacaacacta 1620
 tctttggact acaatttcaa tggcctcgat gaaataatta gtagtgccaa tgaagatcaa 1680
 ggactggctg ggactctgct ggcaaccttc catcaacttc tagacggatt cgatatatac 1740
 actctccatc aactcaaaca tgtttggagc caatgggtca tgaaagtGca gcaaggagag 1800
 ggaagcggcg gggaagacgc ggtgctccta gcgaacacgc tcaacatctg cgccggcctc 1860
 aacgaagacg tgtgtccaa caatgaatac acggctctgt ccaccctcac aaataaaatc 1920
 tgcaatcgcc tcgccccaaat tcaagacaat aagattctcc aagttgtgga tgggagcata 1980
 aaggataagg agctagaaca ggatatgcag gcgttggtga agttagtGct tcaagaaaat 2040
 ggcggcgccc tagacagaaa catcagacac acgtttttgt cggtttccaa gactttctac 2100
 tacgatgcct accacgacga tgagacgacc gatcttcata tctcaaagt actctttcga 2160

ccggtttag gtggttctgg tggcgcaaa atgaaagaga attcaagag ggaagacgat 2220
 aaatttcaa cgacaacgac tttcgatcc gaagatatac cctctaatt gtgtataatc 2280
 gacacccttc aaaggttggg ggtcgatcaa ttctccaat atgaaatcaa cactattcta 2340
 gataacacat tcaggttgtg gcaagaaaaa cacaaagtta tatatggcaa tgttactact 2400
 catgcaatgg catttaggct ttgcgagtg aaaggatacg aagtttcatc agaggagttg 2460
 gctccatag gtaaccaaga ggctgttagc cagcaaacaa atgacctgcc gatgattatt 2520
 gagctttata gagcagcaaa tgagagaata tatgaagaag agaggagtct tgaaaaaatt 2580
 ctgcttga ctaccatctt tctcaataag caagtgaag ataactcaat tcccgacaaa 2640
 aaactgcaca aactggtgga attctactg aggaattaca aaggcataac cataagattg 2700
 ggagctagac gaaacctga gctatatgac atgacctact atcaagctct gaaatctaca 2760
 aacaggttct ctaatttatg caacgaagat ttctagttt tcgcaaagca agatttcgat 2820
 atacatgaag cccagaacca gaaaggactt caacaactgc aaaggtggta tgcagattgt 2880
 aggttgaca ccttaaactt tggaagagat gtagttatta ttgctaatta ttggcttca 2940
 ttaattattg gtgatcatgc gtttgactat gttcgtctcg catttgcaa aacatctgtg 3000
 ctgtgaacaa ttatggatga tttttcgac tgcatggct ctagtcaaga gtgtgacaag 3060
 atcattgaat tagtaaaaga atggaaggag aatccggatg cagagtacgg atctgaggag 3120
 cttagatcc ttttatggc gttgtacaat acagtaaag agttggcgga gagggctcgt 3180
 gttgaacagg ggcgtagtgt caaagagttt ctagtcaaac tgtgggttga aatactctca 3240
 gcttcaaga tagaattaga tacatggagc aatggcacgc agcaaagctt cgatgaatac 3300
 atttctcgt cgtggttgc gaacggttcc cggctgacag gtctcctgac gatgcaattc 3360
 gtcggagtaa aattgtccga tgaaatgctt atgagtgaag agtgcactga ttggctagg 3420
 catgtctgta tggtcggccg gctgtcaac gacgtgtgca gttctgagag ggagcgcgag 3480
 gaaaatattg caggaaaaag ttatagcatt ctactagcaa ctgagaaaga tggaagaaaa 3540
 gttagtgaag atgaagccat tgcagagatc aatgaaatgg ttgaatatca ctggagaaaa 3600

gtgttcaga ttgtgtataa aaaagaaagc attttgccaa gaagatgcaa agatgtattt 3660

ttggagatgg ctaagggtac gtttatgct tatgggatca acgatgaatt gacttctcct 3720

cagcaatcca aggaagatat gaaatccttt gtcttttga 3759

<210> 88

<211> 1252

<212> PRT

<213> Artificial

<220>

<223> Fusion polypeptide containing a LPP synthase and a sclareol synthase from *Salvia sclarea*

<400> 88

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

His Lys Val Glu Val Asn Glu Lys Ile Glu Glu Ser Ile Glu Tyr Val
20 25 30

Gln Asn Leu Leu Met Thr Ser Gly Asp Gly Arg Ile Ser Val Ser Pro
35 40 45

Tyr Asp Thr Ala Val Ile Ala Leu Ile Lys Asp Leu Lys Gly Arg Asp
50 55 60

Ala Pro Gln Phe Pro Ser Cys Leu Glu Trp Ile Ala His His Gln Leu
65 70 75 80

Ala Asp Gly Ser Trp Gly Asp Glu Phe Phe Cys Ile Tyr Asp Arg Ile
85 90 95

Leu Asn Thr Leu Ala Cys Val Val Ala Leu Lys Ser Trp Asn Leu His
100 105 110

Ser Asp Ile Ile Glu Lys Gly Val Thr Tyr Ile Lys Glu Asn Val His
115 120 125

Lys Leu Lys Gly Ala Asn Val Glu His Arg Thr Ala Gly Phe Glu Leu
130 135 140

Val Val Pro Thr Phe Met Gln Met Ala Thr Asp Leu Gly Ile Gln Asp
145 150 155 160

Leu Pro Tyr Asp His Pro Leu Ile Lys Glu Ile Ala Asp Thr Lys Gln
165 170 175

Gln Arg Leu Lys Glu Ile Pro Lys Asp Leu Val Tyr Gln Met Pro Thr
180 185 190

Asn Leu Leu Tyr Ser Leu Glu Gly Leu Gly Asp Leu Glu Trp Glu Arg
195 200 205

Leu Leu Lys Leu Gln Ser Gly Asn Gly Ser Phe Leu Thr Ser Pro Ser
210 215 220

Ser Thr Ala Ala Val Leu Met His Thr Lys Asp Glu Lys Cys Leu Lys
225 230 235 240

Tyr Ile Glu Asn Ala Leu Lys Asn Cys Asp Gly Gly Ala Pro His Thr
245 250 255

Tyr Pro Val Asp Ile Phe Ser Arg Leu Trp Ala Ile Asp Arg Leu Gln
260 265 270

Arg Leu Gly Ile Ser Arg Phe Phe Gln His Glu Ile Lys Tyr Phe Leu
275 280 285

Asp His Ile Glu Ser Val Trp Glu Glu Thr Gly Val Phe Ser Gly Arg
290 295 300

Tyr Thr Lys Phe Ser Asp Ile Asp Asp Thr Ser Met Gly Val Arg Leu
305 310 315 320

Leu Lys Met His Gly Tyr Asp Val Asp Pro Asn Val Leu Lys His Phe
325 330 335

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

Ser Ala Ser Pro Met Tyr Asn Leu Tyr Arg Ala Ala Gln Leu Arg Phe
355 360 365

Pro Gly Glu Glu Val Leu Glu Glu Ala Thr Lys Phe Ala Phe Asn Phe
370 375 380

Leu Gln Glu Met Leu Val Lys Asp Arg Leu Gln Glu Arg Trp Val Ile
385 390 395 400

Ser Asp His Leu Phe Asp Glu Ile Lys Leu Gly Leu Lys Met Pro Trp
405 410 415

Tyr Ala Thr Leu Pro Arg Val Glu Ala Ala Tyr Tyr Leu Asp His Tyr
420 425 430

Ala Gly Ser Gly Asp Val Trp Ile Gly Lys Ser Phe Tyr Arg Met Pro
435 440 445

Glu Ile Ser Asn Asp Thr Tyr Lys Glu Leu Ala Ile Leu Asp Phe Asn
450 455 460

Arg Cys Gln Thr Gln His Gln Leu Glu Trp Ile His Met Gln Glu Trp
465 470 475 480

Tyr Asp Arg Cys Ser Leu Ser Glu Phe Gly Ile Ser Lys Arg Glu Leu
485 490 495

Leu Arg Ser Tyr Phe Leu Ala Ala Ala Thr Ile Phe Glu Pro Glu Arg
500 505 510

Thr Gln Glu Arg Leu Leu Trp Ala Lys Thr Arg Ile Leu Ser Lys Met
515 520 525

Ile Thr Ser Phe Val Asn Ile Ser Gly Thr Thr Leu Ser Leu Asp Tyr
530 535 540

Asn Phe Asn Gly Leu Asp Glu Ile Ile Ser Ser Ala Asn Glu Asp Gln
545 550 555 560

Gly Leu Ala Gly Thr Leu Leu Ala Thr Phe His Gln Leu Leu Asp Gly
565 570 575

Phe Asp Ile Tyr Thr Leu His Gln Leu Lys His Val Trp Ser Gln Trp
580 585 590

Phe Met Lys Val Gln Gln Gly Glu Gly Ser Gly Gly Glu Asp Ala Val
595 600 605

Leu Leu Ala Asn Thr Leu Asn Ile Cys Ala Gly Leu Asn Glu Asp Val
610 615 620

Leu Ser Asn Asn Glu Tyr Thr Ala Leu Ser Thr Leu Thr Asn Lys Ile
625 630 635 640

Cys Asn Arg Leu Ala Gln Ile Gln Asp Asn Lys Ile Leu Gln Val Val
645 650 655

Asp Gly Ser Ile Lys Asp Lys Glu Leu Glu Gln Asp Met Gln Ala Leu
660 665 670

Val Lys Leu Val Leu Gln Glu Asn Gly Gly Ala Val Asp Arg Asn Ile
675 680 685

Arg His Thr Phe Leu Ser Val Ser Lys Thr Phe Tyr Tyr Asp Ala Tyr
690 695 700

His Asp Asp Glu Thr Thr Asp Leu His Ile Phe Lys Val Leu Phe Arg
705 710 715 720

Pro Val Val Gly Gly Ser Gly Gly Ala Lys Met Lys Glu Asn Phe Lys
 725 730 735

Arg Glu Asp Asp Lys Phe Pro Thr Thr Thr Thr Leu Arg Ser Glu Asp
 740 745 750

Ile Pro Ser Asn Leu Cys Ile Ile Asp Thr Leu Gln Arg Leu Gly Val
 755 760 765

Asp Gln Phe Phe Gln Tyr Glu Ile Asn Thr Ile Leu Asp Asn Thr Phe
 770 775 780

Arg Leu Trp Gln Glu Lys His Lys Val Ile Tyr Gly Asn Val Thr Thr
785 790 795 800

His Ala Met Ala Phe Arg Leu Leu Arg Val Lys Gly Tyr Glu Val Ser
 805 810 815

Ser Glu Glu Leu Ala Pro Tyr Gly Asn Gln Glu Ala Val Ser Gln Gln
 820 825 830

Thr Asn Asp Leu Pro Met Ile Ile Glu Leu Tyr Arg Ala Ala Asn Glu
 835 840 845

Arg Ile Tyr Glu Glu Glu Arg Ser Leu Glu Lys Ile Leu Ala Trp Thr
 850 855 860

Thr Ile Phe Leu Asn Lys Gln Val Gln Asp Asn Ser Ile Pro Asp Lys
865 870 875 880

Lys Leu His Lys Leu Val Glu Phe Tyr Leu Arg Asn Tyr Lys Gly Ile
 885 890 895

Thr Ile Arg Leu Gly Ala Arg Arg Asn Leu Glu Leu Tyr Asp Met Thr
900 905 910

Tyr Tyr Gln Ala Leu Lys Ser Thr Asn Arg Phe Ser Asn Leu Cys Asn
915 920 925

Glu Asp Phe Leu Val Phe Ala Lys Gln Asp Phe Asp Ile His Glu Ala
930 935 940

Gln Asn Gln Lys Gly Leu Gln Gln Leu Gln Arg Trp Tyr Ala Asp Cys
945 950 955 960

Arg Leu Asp Thr Leu Asn Phe Gly Arg Asp Val Val Ile Ile Ala Asn
965 970 975

Tyr Leu Ala Ser Leu Ile Ile Gly Asp His Ala Phe Asp Tyr Val Arg
980 985 990

Leu Ala Phe Ala Lys Thr Ser Val Leu Val Thr Ile Met Asp Asp Phe
995 1000 1005

Phe Asp Cys His Gly Ser Ser Gln Glu Cys Asp Lys Ile Ile Glu
1010 1015 1020

Leu Val Lys Glu Trp Lys Glu Asn Pro Asp Ala Glu Tyr Gly Ser
1025 1030 1035

Glu Glu Leu Glu Ile Leu Phe Met Ala Leu Tyr Asn Thr Val Asn
1040 1045 1050

Glu Leu Ala Glu Arg Ala Arg Val Glu Gln Gly Arg Ser Val Lys
1055 1060 1065

Glu Phe Leu Val Lys Leu Trp Val Glu Ile Leu Ser Ala Phe Lys
1070 1075 1080

Ile Glu Leu Asp Thr Trp Ser Asn Gly Thr Gln Gln Ser Phe Asp
1085 1090 1095

Glu Tyr Ile Ser Ser Ser Trp Leu Ser Asn Gly Ser Arg Leu Thr
1100 1105 1110

Gly Leu Leu Thr Met Gln Phe Val Gly Val Lys Leu Ser Asp Glu
1115 1120 1125

Met Leu Met Ser Glu Glu Cys Thr Asp Leu Ala Arg His Val Cys
1130 1135 1140

Met Val Gly Arg Leu Leu Asn Asp Val Cys Ser Ser Glu Arg Glu
1145 1150 1155

Arg Glu Glu Asn Ile Ala Gly Lys Ser Tyr Ser Ile Leu Leu Ala
1160 1165 1170

Thr Glu Lys Asp Gly Arg Lys Val Ser Glu Asp Glu Ala Ile Ala
1175 1180 1185

Glu Ile Asn Glu Met Val Glu Tyr His Trp Arg Lys Val Leu Gln
1190 1195 1200

Ile Val Tyr Lys Lys Glu Ser Ile Leu Pro Arg Arg Cys Lys Asp
1205 1210 1215

Val Phe Leu Glu Met Ala Lys Gly Thr Phe Tyr Ala Tyr Gly Ile
1220 1225 1230

Asn Asp Glu Leu Thr Ser Pro Gln Gln Ser Lys Glu Asp Met Lys
1235 1240 1245

Ser Phe Val Phe
1250