

P0101WOASequenceListing
SEQUENCE LISTING

<110> Karpinski, Stanislaw
Szechynska-Hebda, Magdalena
Slesak, Ireneusz
Wituszynska, Weronika

<120> PLANT TREATMENT METHODS AND MEANS THEREFOR

<130> POLTP0101WOA

<150> US 61/577,279
<151> 2011-12-19

<160> 12

<170> PatentIn version 3.5

<210> 1
<211> 541
<212> PRT
<213> Arabidopsis Thaliana Phytoalexin Deficient 4

<400> 1

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

Ile Ser Thr Pro Leu Phe Thr Asp Ser Trp Ser Ser Cys Asn Thr Ala
20 25 30

Asn Cys Asn Gly Ser Ile Lys Ile His Asp Ile Ala Gly Ile Thr Tyr
35 40 45

Val Ala Ile Pro Ala Val Ser Met Ile Gln Leu Gly Asn Leu Val Gly
50 55 60

Leu Pro Val Thr Gly Asp Val Leu Phe Pro Gly Leu Ser Ser Asp Glu
65 70 75 80

Pro Leu Pro Met Val Asp Ala Ala Ile Leu Lys Leu Phe Leu Gln Leu
85 90 95

Lys Ile Lys Glu Gly Leu Glu Leu Glu Leu Leu Gly Lys Lys Leu Val
100 105 110

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

Leu Trp Leu Leu Ser Gln Ser Ser Pro Pro Ser Phe Arg Val Phe Cys
130 135 140

Ile Thr Phe Gly Ser Pro Leu Leu Gly Asn Gln Ser Leu Ser Thr Ser
145 150 155 160

P0101WOASequenceListing

Ile Ser Arg Ser Arg Leu Ala His Asn Phe Cys His Val Val Ser Ile
165 170 175

His Asp Leu Val Pro Arg Ser Ser Asn Glu Gln Phe Trp Pro Phe Gly
180 185 190

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

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

Asn Thr Glu Glu His Gln Arg Tyr Gly His Tyr Val Phe Thr Leu Ser
225 230 235 240

His Met Phe Leu Lys Ser Arg Ser Phe Leu Gly Gly Ser Ile Pro Asp
245 250 255

Asn Ser Tyr Gln Ala Gly Val Ala Leu Ala Val Glu Ala Leu Gly Phe
260 265 270

Ser Asn Asp Asp Thr Ser Gly Val Leu Val Lys Glu Cys Ile Glu Thr
275 280 285

Ala Thr Arg Ile Val Arg Ala Pro Ile Leu Arg Ser Ala Glu Leu Ala
290 295 300

Asn Glu Leu Ala Ser Val Leu Pro Ala Arg Leu Glu Ile Gln Trp Tyr
305 310 315 320

Lys Asp Arg Cys Asp Ala Ser Glu Glu Gln Leu Gly Tyr Tyr Asp Phe
325 330 335

Phe Lys Arg Tyr Ser Leu Lys Arg Asp Phe Lys Val Asn Met Ser Arg
340 345 350

Ile Arg Leu Ala Lys Phe Trp Asp Thr Val Ile Lys Met Val Glu Thr
355 360 365

Asn Glu Leu Pro Phe Asp Phe His Leu Gly Lys Lys Trp Ile Tyr Ala
370 375 380

Ser Gln Phe Tyr Gln Leu Leu Ala Glu Pro Leu Asp Ile Ala Asn Phe
385 390 395 400

Tyr Lys Asn Arg Asp Ile Lys Thr Gly Gly His Tyr Leu Glu Gly Asn
Page 2

P0101WOASequenceListing

405

410

415

Arg Pro Lys Arg Tyr Glu Val Ile Asp Lys Trp Gln Lys Gly Val Lys
 420 425 430

Val Pro Glu Glu Cys Val Arg Ser Arg Tyr Ala Ser Thr Thr Gln Asp
 435 440 445

Thr Cys Phe Trp Ala Lys Leu Glu Gln Ala Lys Glu Trp Leu Asp Glu
 450 455 460

Ala Arg Lys Glu Ser Ser Asp Pro Gln Arg Arg Ser Leu Leu Arg Glu
 465 470 475 480

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

Glu Val Ser Leu Asp Val Lys Ala Lys Asn Ser Ser Tyr Ser Val Trp
 500 505 510

Glu Ala Asn Leu Lys Glu Phe Lys Cys Lys Met Gly Tyr Glu Asn Glu
 515 520 525

Ile Glu Met Val Val Asp Glu Ser Asp Ala Met Glu Thr
 530 535 540

<210> 2
 <211> 210
 <212> PRT
 <213> Arabidopsis Thaliana Lesion Simulating Disease 1
 <400> 2

Met Gln Asp Gln Leu Val Cys His Gly Cys Arg Asn Leu Leu Met Tyr
 1 5 10 15

Pro Arg Gly Ala Ser Asn Val Arg Cys Ala Leu Cys Asn Thr Ile Asn
 20 25 30

Met Val Pro Pro Pro Pro Pro His Asp Met Ala His Ile Ile Cys
 35 40 45

Gly Gly Cys Arg Thr Met Leu Met Tyr Thr Arg Gly Ala Ser Ser Val
 50 55 60

Arg Cys Ser Cys Cys Gln Thr Thr Asn Leu Val Pro Glu Ser Ser Phe
 65 70 75 80

Thr Leu Leu Phe Asp Asn Ile Leu Lys Val Leu Lys Thr Lys Leu Leu

P0101WOASequenceListing

85

90

95

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

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

Met Tyr Pro Tyr Gly Ala Ser Ser Val Lys Cys Ala Val Cys Gln Phe
 130 135 140

Val Thr Asn Val Asn Met Ser Asn Gly Arg Val Pro Leu Pro Thr Asn
 145 150 155 160

Arg Pro Asn Gly Thr Ala Cys Pro Pro Ser Thr Ser Thr Ser Thr Pro
 165 170 175

Pro Ser Gln Thr Gln Thr Val Val Val Glu Asn Pro Met Ser Val Asp
 180 185 190

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

Lys Lys
 210

<210> 3

<211> 623

<212> PRT

<213> Arabidopsis Thaliana Enhanced Disease Susceptibility 1

<400> 3

Met Ala Phe Glu Ala Leu Thr Gly Ile Asn Gly Asp Leu Ile Thr Arg
 1 5 10 15

Ser Trp Ser Ala Ser Lys Gln Ala Tyr Leu Thr Glu Arg Tyr His Lys
 20 25 30

Glu Glu Ala Gly Ala Val Val Ile Phe Ala Phe Gln Pro Ser Phe Ser
 35 40 45

Glu Lys Asp Phe Phe Asp Pro Asp Asn Lys Ser Ser Phe Gly Glu Ile
 50 55 60

Lys Leu Asn Arg Val Gln Phe Pro Cys Met Arg Lys Ile Gly Lys Gly
 65 70 75 80

Asp Val Ala Thr Val Asn Glu Ala Phe Leu Lys Asn Leu Glu Ala Ile
 Page 4

P0101WOASequenceListing

85

90

95

Ile Asp Pro Arg Thr Ser Phe Gln Ala Ser Val Glu Met Ala Val Arg
100 105 110

Ser Arg Lys Gln Ile Val Phe Thr Gly His Ser Ser Gly Gly Ala Thr
115 120 125

Ala Ile Leu Ala Thr Val Trp Tyr Leu Glu Lys Tyr Phe Ile Arg Asn
130 135 140

Pro Asn Val Tyr Leu Glu Pro Arg Cys Val Thr Phe Gly Ala Pro Leu
145 150 155 160

Val Gly Asp Ser Ile Phe Ser His Ala Leu Gly Arg Glu Lys Trp Ser
165 170 175

Arg Phe Phe Val Asn Phe Val Ser Arg Phe Asp Ile Val Pro Arg Ile
180 185 190

Met Leu Ala Arg Lys Ala Ser Val Glu Glu Thr Leu Pro His Val Leu
195 200 205

Ala Gln Leu Asp Pro Arg Lys Ser Ser Val Gln Glu Ser Glu Gln Arg
210 215 220

Ile Thr Glu Phe Tyr Thr Arg Val Met Arg Asp Thr Ser Thr Val Ala
225 230 235 240

Asn Gln Ala Val Cys Glu Leu Thr Gly Ser Ala Glu Ala Phe Leu Glu
245 250 255

Thr Leu Ser Ser Phe Leu Glu Leu Ser Pro Tyr Arg Pro Ala Gly Thr
260 265 270

Phe Val Phe Ser Thr Glu Lys Arg Leu Val Ala Val Asn Asn Ser Asp
275 280 285

Ala Ile Leu Gln Met Leu Phe Tyr Thr Ser Gln Ala Ser Asp Glu Gln
290 295 300

Glu Trp Ser Leu Ile Pro Phe Arg Ser Ile Arg Asp His His Ser Tyr
305 310 315 320

Glu Glu Leu Val Gln Ser Met Gly Lys Lys Leu Phe Asn His Leu Asp
325 330 335

P0101WOASequenceListing

Gly Glu Asn Ser Ile Glu Ser Thr Leu Asn Asp Leu Gly Val Ser Thr
 340 345 350

Arg Gly Arg Gln Tyr Val Gln Ala Ala Leu Glu Glu Glu Lys Lys Arg
 355 360 365

Val Glu Asn Gln Lys Lys Ile Ile Gln Val Ile Glu Gln Glu Arg Phe
 370 375 380

Leu Lys Lys Leu Ala Trp Ile Glu Asp Glu Tyr Lys Pro Lys Cys Gln
 385 390 400

Ala His Lys Asn Gly Tyr Tyr Asp Ser Phe Lys Val Ser Asn Glu Glu
 405 410 415

Asn Asp Phe Lys Ala Asn Val Lys Arg Ala Glu Leu Ala Gly Val Phe
 420 425 430

Asp Glu Val Leu Gly Leu Met Lys Lys Cys Gln Leu Pro Asp Glu Phe
 435 440 445

Glu Gly Asp Ile Asp Trp Ile Lys Leu Ala Thr Arg Tyr Arg Arg Leu
 450 455 460

Val Glu Pro Leu Asp Ile Ala Asn Tyr His Arg His Leu Lys Asn Glu
 465 470 475 480

Asp Thr Gly Pro Tyr Met Lys Arg Gly Arg Pro Thr Arg Tyr Ile Tyr
 485 490 495

Ala Gln Arg Gly Tyr Glu His Tyr Ile Leu Lys Pro Asn Gly Met Ile
 500 505 510

Ala Glu Asp Val Phe Trp Asn Lys Val Asn Gly Leu Asn Leu Gly Leu
 515 520 525

Gln Leu Glu Glu Ile Gln Glu Thr Leu Lys Asn Ser Gly Ser Glu Cys
 530 535 540

Gly Ser Cys Phe Trp Ala Glu Val Glu Glu Leu Lys Gly Lys Pro Tyr
 545 550 555 560

Glu Glu Val Glu Val Arg Val Lys Thr Leu Glu Gly Met Leu Gly Glu
 565 570 575

Trp Ile Thr Asp Gly Glu Val Asp Asp Lys Glu Ile Phe Leu Glu Gly
 580 585 590

P0101WOASequenceListing

Ser Thr Phe Arg Lys Trp Trp Ile Thr Leu Pro Lys Asn His Lys Ser
 595 600 605

His Ser Pro Leu Arg Asp Tyr Met Met Asp Glu Ile Thr Asp Thr
 610 615 620

<210> 4
 <211> 1932
 <212> DNA
 <213> Aarabidopsis Thaliana Phytoalexin Deficient 4

<400> 4
 ataaaaccag tacaatttta ctaaattatg atgttaaagt aagagacttt gaagaagacg 60
 acttagcaaa gaccaaacc aagaaattac ataggaacaa gccaagaaga tacatagata 120
 atttcttttt gcttgtaata tatttacaac ttcataaaca tcatcgttct gcaactctct 180
 actcgatadc caatcatgga cgattgtcga ttcgagacga gtgagttgca agcttcggta 240
 atgatadcga ctcttttatt taccgattct tggagttcat gcaacaccgc aaattgcaac 300
 gggagtataa agatccatga catcgccggg attacatacg ttgctatacc ggcggtatcg 360
 atgattcagt tggggaatct tgtgggcttg ccagtcaccg gagatgttct tttccccggc 420
 ttatcctccg atgaacctct acctatggtc gacgctgcca tactcaaact ctttcttcag 480
 ttaaagatca aggaaggatt ggaattggaa ttgttaggta aaaagctggt ggtgataacc 540
 ggccattcaa ccggcggcgc attggccgct ttcaccgcac tttggcttct atctcaatct 600
 tctccgccgt cattccgcgt cttttgtatc acctttggct ctctctgct cggaaaccaa 660
 tctctctcca cctcaatttc acgatcacgt ttagcacaca acttctgcca cgtggtctcc 720
 atccacgacc tcgttcttag aagcagcaat gaacaattct ggccctttgg aacttacttg 780
 ttctgttccg acaaaggagg tgtctgtcta gacaacgctg gttctgttcg tctgatgttt 840
 aatatcctca acaccacagc aactcaaac accgaggaac atcagaggta cggacactat 900
 gtgttcacac tttcacacat gtttcttaa tctagaagct ttcttgggtg gagtatcccc 960
 gacaatagct accaagctgg tgttgcgta gccgttgaag ctctagggtt ctctaacgat 1020
 gacacaagtg gcgttttagt caaagaatgt atagaaacag ctacaagaat tgttcgggct 1080
 cctattctga ggtcagctga gttagccaat gagcttgcta gtgtcttgcc agcaagactc 1140
 gagattcaat ggtacaaaga tcgttgcgat gcatcagaag agcagctagg ttactacgat 1200
 ttcttcaaac gatattcggt gaagagagac tttaaagtga acatgagtcg cataagacta 1260
 gctaagtttt gggacacagt gattaaaatg gtggagacga atgagttacc ttttgatttt 1320
 catttaggaa agaaatggat ttacgcatct caattttatc aactcttagc cgagccactc 1380
 gacattgcga atttctacaa aaacagagat ataaagactg gcgggcatta cttggagggg 1440

P0101WOASequencesListing

aatagaccta aaaggtatga ggtgattgat aaatggcaga aaggagttaa agtgcctgag 1500
gagtgtgtga gaagcagata cgcgagcaca acgcaagata cttgcttttg ggctaagctt 1560
gagcaagcaa aagagtgggtt ggatgaggcg agaaaagaga gtagtgatcc ccagaggaga 1620
tctttgttac gggaaaagat tgttccattc gagagttatg cgaatacatt ggtgacgaag 1680
aaggaggttt ctttgatgt taaagcgaag aactcgagtt atagtgtgtg ggaggcgaat 1740
ctgaaagagt tcaagtgcaa aatgggttat gaaaatgaaa ttgagatggg tgttgatgag 1800
agtgacgcaa tggagactta gtaggactaa tagcaaatcg aatgtttgat atgctatata 1860
acaatctgta tcattgttgt tcatcatggt tatgcaagac tttctgatga atgttactat 1920
atattctaaa ac 1932

<210> 5
<211> 1248
<212> DNA
<213> Arabidopsis Thaliana Lesion Simulating Disease 1

<400> 5
cttacgcgtc atgtaaaaaa aaaagaagcg taaattacga aaaacagaga gataaatccg 60
ggcattgaga ttttgagat agagagagag aaaaatcgaa atctattgtc tatctcctca 120
atttgattg gattttctgc atatcatcgc tctagctttc gcgggttttg gattcgattc 180
cttacccttc tccaatcgaa gtttttggtt ttgaattgga tttgggtttc gttccaaaat 240
cagctctttt tgttaatcag cagatatgca ggaccagctg gtgtgtcatg gttgtaggaa 300
tttattgatg tatcctagag gagcatctaa tgtgctgtgt gcggttatgta acactatcaa 360
catggttcct cctcctcctc cacctcacga catggcacac attatatgtg gtggtttag 420
aacaatgctt atgtatacgc gtggggctag tagcgtaaga tgctcttgct gtcaaactac 480
gaaccttgtg ccagaatctt ctttcacact tttgtttgat aacattctga aagtacttaa 540
aacaagctt ttagatggtc ccggtggact agcgcactcc aatcagggtg cccatgctcc 600
ttccagtcag gttgvcgaga tcaattgtgg gcattgtcgg acgaccctca tgtatcctta 660
cgggtcatca tccgtcaaat gcgctgtttg tcaattcgta actaacgta atatgagcaa 720
tggaagggtg cctctcccaa ctaaccggcc aaatggaaca gcttgcctcc cctctacatc 780
aacttcaaca ccaccctctc agaccctaac cgttgttgta gaaaaccca tgtccgttga 840
tgaaagcggg aagttgggtg gcaatgttgt tgttggagtg acaactgaca aaaagtaatc 900
aagaatgagt gagatcttaa agatcaaatc caaattcttc ctctattcct gcgtttggtt 960
tgtgcatatt acatacgcgg aaaaactgta tgttatata ctcttgactc ctttttaacc 1020
caagagaaaa agcttatcag aatctcttgt tactgcatta ttggggttta ttcaaagttg 1080
aagacacaag gtttttgctc gaataatttg gcattctttt gctccatgga acttgacctt 1140

P0101WOASequencesListing

ctcttctggt tgttgacttc taaaactcca tcggcccttg tggcattggt aatgtatgta 1200
 tgaatataat ctgatacacc aaccaatcat taagatttgg gtttgaaa 1248

<210> 6
 <211> 2139
 <212> DNA
 <213> Arabidopsis Thaliana Enhanced Disease Susceptibility 1

<400> 6
 gagtaggagc ggattaaaga agcaagacga ttcaaaagaa aaaagagaga agaaagtcca 60
 ctaaagaaaa gagaatagat atagatcaat ggcgtttgaa gctcttaccg gaatcaatgg 120
 tgatctaadc accagatcat ggtcagcctc gaagcaagct tacctaaccg agcgctatca 180
 caaggaagaa gcaggagcag tcgtaatctt cgctttccaa ccatctttct cagagaaaga 240
 tttcttcgat ccggacaata aatcttcctt tggagaaatc aagttgaacc gtgttcagtt 300
 tccttgtatg aggaaaatcg gtaaagggtga tgtagctact gttaacgaag ctttcctcaa 360
 gaatcttgaa gctatcattg atccaagaac ctcatctcaa gcttctgtgg aaatggctgt 420
 gaggagtaga aaacagatag tgttcacagg acattcctca ggagggtgca ctgcaatctt 480
 agcaacagtt tggtatattg agaaatactt catacgcaat ccaaatgttt accttgagcc 540
 tcgttgtgtg acatttgagg ctcttttggg tggtagctct atcttcagtc acgcacttgg 600
 gagagaaaaa tggagccggt tctttgtgaa ctttgtctca agattcgata ttgtccctcg 660
 gattatgctt gctcgaaagg cgtctgtaga ggaaactttg cctcatgttc ttgcccaatt 720
 ggatcccaga aagtcttccg tccaagagag tgaacagaga ataacagagt tttacacaag 780
 ggtgatgca gacacatcaa ctggtgcaaa ccaagctggt tgtgaattga ctggaagcgc 840
 agaggcgttt ttagagacc tttctagttt ccttgagcta agtccttata gacccgccgg 900
 tacttttgtt ttctctacag agaagagatt ggttgagctg aacaactcgg acgccattct 960
 tcaaatgctg ttttacactt ctcaagccag cgatgaacaa gaatggctc taattccatt 1020
 tcgaagtatc agagatcatc atagctatga ggaactggta cagtcgatgg gaaagaagtt 1080
 gtttaatcat ttggatggag aaaactcaat agagtctacg ctcaatgacc ttggagtggag 1140
 cacaagaggc agacagtacg ttcaagctgc attagaggaa gagaagaaac gagtagagaa 1200
 tcagaagaag attattcagg tgatcgagca agagagggtt ttaaagaaac tagcatggat 1260
 agaagatgaa tacaagccaa agtgtcaagc ccataaaaat gggattattg attccttcaa 1320
 agtttcaaat gaagagaatg acttcaaagc aaacgtcaag agagctgagt tagccggtgt 1380
 ttttgacgag gtgcttgggt taatgaagaa atgtcaactt ccagatgagt tcgaagggga 1440
 catagattgg atcaagttag caactcgata ccgcagatta gttgagcctc ttgatattgc 1500
 aaactacat cgacatttaa agaacgaaga cacagggccg tacatgaaaa gaggaagacc 1560

P0101WOASequenceListing

aacccgctac	atatatgctc	agagaggcta	cgaacattat	atactgaagc	caaacggaat	1620
gattgcagaa	gatgtatfff	ggaacaaggt	aatgggtcct	aacttagggg	tacagctaga	1680
agaaattcaa	gagactctaa	agaattcggg	atccgagtg	ggatcatgct	tttgggctga	1740
ggttgaagaa	ctcaaaggaa	agccatacga	ggaagttgag	gtaagagtta	agacattaga	1800
agggatgctt	ggagaatgga	tcacagacgg	ggaggtagat	gataaggaaa	tatttctgga	1860
gggttcaacg	tttagaaagt	ggtggattac	gcttcccaaa	aatcaciaaat	cgcattctcc	1920
tctgcgagac	tatatgatgg	atgaaataac	agatacctga	accttaggtg	gtggagtatt	1980
taagctatta	gaacacttgc	ttctcttaat	ttgtgcaata	agaaatgttt	atcaatctgg	2040
tttccacttc	atgatgatct	tagaataaga	aacatgtttg	atgatcattg	tgaagtaatg	2100
taatagctct	ctattctaat	gtcaaatttg	gtttccact			2139

<210> 7
 <211> 1608
 <212> DNA
 <213> Populus Trichocarpa Phytoalexin Deficient 4

<400> 7						
aggtttgaga	ctagttagat	gctggccgat	ttcttggtct	ccacaccatt	gctatccgag	60
tcatggaggt	tatgcaatct	cgccacagca	aactcaccac	agagtttcgt	agttgatcag	120
gtcggaaagta	ttgggtatgt	ggccttttcc	ggcaccctat	ttgtatcagg	ctcagacccc	180
agtttcaaga	atgtggttcg	tttgccagta	catgatgttg	ctggcaatga	cctttttggt	240
cctttacatg	acaaaaatga	aggggaagag	cctgtcatgg	tgcaagggtgc	cttgctgagg	300
attttcgaga	atatatacag	cgacccaagt	tttcaaaacc	aggtcagttt	tcttccatgt	360
cagtcaatta	tcttcacagg	ccattccatt	ggtggaacag	ctgcctctct	tgctgctctt	420
tggctccttt	cttaccttca	atccaattct	ccaaacctct	cagttctgtg	catcaccttt	480
ggctctccat	tgctaggcaa	cgagaccctt	tctcgtgcca	ttcttcgca	aagatggggg	540
ggcaaatfff	gccatgttgt	atcaaagtta	gtagaagctg	gggaagaggc	agtgacagga	600
gtgttttaggc	catttgggaa	ctatfffctt	tgttctgaag	acggagcaat	ttgtgtggac	660
aacgtggaat	ctgttattaa	aatgatgtat	ttgttgctcg	caacgggggc	gcctagctat	720
agcattgagg	atcatctcaa	gtatggtgat	tatgtagaga	gaatttcctc	acaatfffct	780
gagaggaaaa	gttccatgga	aggagagctt	cctgaatcaa	gctatgaagc	aggagtgtga	840
ctggcattgc	agtcacggg	aattgccagt	caggtaatgc	tttctattag	aattacaaaa	900
gattgcctaa	aggcagcaag	gcgaatgggt	cgtaaccaa	acctaaactg	tgccaatctg	960
gcaattaagt	tgtccagaat	caatccttac	agggcagaaa	tagagtggta	taaagcgttg	1020
tgcgaccggg	ctgatgatca	gatgggttac	tatgactcct	ttaaacgaag	gggagcctcg	1080

P0101WOASequenceListing

aaaagggact ttaaagtcaa cttgaaccgg cacaagctag ctcagttttg ggacaacgta 1140
 atcgacttga tggaaagcaa tcaactccct catgattttc acaaacatgg aaaatgggtc 1200
 tattcttcac agtcctataa gctccttgtc gagcctctgg atattgctga gtattatcga 1260
 acaggcatgc atcacagtaa ggggcattac attaaccatg gaagagagag gaggtaccag 1320
 atattcgata ggtggtggaa aaatgttaga gttgaagaga ataaacggag caagtttgct 1380
 agtttgactc aggacacatg tttttgggca aaagtggagg aagctagggg gttgtagat 1440
 gatggtggga atactagga tcctagtcac tcggcttttc tttggaagaa tatggatggt 1500
 tttgcaaact atgcaaaagc gttggttgaa gctaaggagg tgtctataga tgtggtggca 1560
 aagaattcga gctattcttt gtggctgaaa gattataatg aactgaaa 1608

<210> 8
 <211> 711
 <212> DNA
 <213> Populus Trichocarpa Predicted Lesion Simulating Disease 1

<400> 8
 atgcaaagcc aggtggtgtg tagagggtgt gcaagtgtat tgttatatcc aagtggagct 60
 tctaacgttt gttgtgcttt atgtagtact gttacttcca ttccttctcc tgggatggac 120
 atggctcaac tcatatgtag aggttgcagg tcattgctaa tgtatccaca tggggcaaca 180
 actgtgagat gtcctgctg ccacgtagtg aacattgcac caggatataa ccaggccgct 240
 catgtcaact gtgggaactg ccggactgct cttatgtatc caaatggatc tccatctgtc 300
 aagtgtcctg tctgtcacta tgttactaat gttagtagtg ctaacatgag aattccgctt 360
 ccagcaaaca gacctaagtg tataggtgga acagcaccat ctacttcaat gccattgccc 420
 cattctcaga ctcaaactgt cgttgtggaa aaccccatgt ctggtgatga aagtggcaaa 480
 ttggtcagca atgttgttgt cgggtgcact acagaaaaaa aataaccggg tgagattttg 540
 aaatcttgct gtatatttgg gaggtaatgg cccagattca tactatcgct gtgaagaagg 600
 atatgcaaat tcattgtgta ttttttatt aaaatagcca tgagcaacat ttgttcaaaa 660
 accatcttga atacgcatc tgttggagaa atttgacgtg tggatgtgta c 711

<210> 9
 <211> 1767
 <212> DNA
 <213> Populus Trichocarpa Enhanced Disease Susceptibility 1

<400> 9
 atgggtattg ttaagcttgg agagaacatg gagatcaaag aagaggatgat catgaaagct 60
 tgttcaatgg ccatgaaggc tcacaaatct ccagagaagc aatatctttc tgaagggatt 120
 catagttcat catctgaagt tgtcttttagc tttgctggat ctttgtctgt aaatgattgg 180
 tttgctggaa gtgcctttgg agaaatgaag gtggatcttc agttctttcc ttctctcaaa 240

P0101WOASequenceListing

tatgttggtc ttgatcaaac tggcaggggc aatgaagcct ttttcaaaag attcgaagca 300
gttttggcta atccacgggtt caaagttgag gtggaaaaag ctgtggccga cagaaggcaa 360
gttgtattta ctggccactc ttcaggaggg gcaattgcca tactggcaac agcttggttc 420
ttggaagtgt acaatagaca gagctccaac tgcattggcg cactctgcct gacttttggg 480
tctccccttg tcggtgatta cattataaac attgcaatta ggcgtgaaaa atgggtctcgc 540
tactttgtta atttcgttat gagatatgac attgtccctc ggatttcact ctgtccactc 600
tcttccatta agcaacaact tcagcgagtc ctcgattact ttaatcaaaa cgcgccacaa 660
cctcctaata atgccccagc tttctatgaa actgtggtga aaaatgcatc atctgttgct 720
aactatgctg cctgtaagat catggggagc acgaatccgt tgctggaaac tgtatcgagt 780
ttcattgaac caagtccgta tagacccttc gggacttacg tcttttgtac aggaactggg 840
aaacttgttg tcataagtaa ccctgatgct gtgctgcaag tactgttcta ttcctcccag 900
ttgagcactg aagaagagaa ggtgacagtt gcccaacaa gcctaagaga tcatttgaac 960
tacgaaaatt acctgcaaga gcacttaaaa acgccagctg taacaagttt attccatcat 1020
cgccaagaag cacttgcaag gtctttggaat gttgcaagcg ttgagcgtga gaaagttgat 1080
atggccttga atgacctagg cctgagtga agagccagac tgtctcttcg tgctgctgaa 1140
gcgttagaga agcagaagtt gaggaaccag gatacaattg atggaaagaa gaaagatatt 1200
gagaaatggt tagataagct acaagaatac caaagtaagt gtgctcataa agtcggctat 1260
tatgatgcct tcaagtgttc agaagaagag gaggatttcc atgctaattg agcgaggctt 1320
gagctagcag gtacatggga tgtaataata gaaatgttga aaaggatga actccctgat 1380
gagtttgagg gccagaagga atggataggt ctcggaacca ggtatcgccg cattgttgaa 1440
cccttgata tcgcaaatta ctaccgacac ctcaagaatg aagacacagg accctatatg 1500
ggaaagggca ggccaagacg gtataaatgc actcaaaaat ggcgtgagca tgctgagcag 1560
ttgccaaatg aaattccaga atcctgtttc tgggctgagg tagaggaact atgcattaaa 1620
gcaggttgcc agggaactat agaaagcatt ttgcacctaa agacgaaagt tgataagtgg 1680
attcaaatg aggaacttgg tggatgatgt ctgttgagga attccacctt tacgaaattg 1740
cagaaacaac atttcctgac caactga 1767

<210> 10
<211> 536
<212> PRT
<213> Populus Trichocarpa Phytoalexin Deficient 4
<400> 10

Arg Phe Glu Thr Ser Glu Met Leu Ala Asp Phe Leu Ala Ser Thr Pro
1 5 10 15

P0101WOASequenceListing

Leu Leu Ser Glu Ser Trp Arg Leu Cys Asn Leu Ala Thr Ala Asn Ser
 20 25 30
 Pro Gln Ser Phe Val Val Asp Gln Val Gly Ser Ile Gly Tyr Val Ala
 35 40 45
 Phe Ser Gly Thr Leu Phe Val Ser Gly Ser Asp Pro Ser Phe Lys Asn
 50 55 60
 Leu Val Arg Leu Pro Val His Asp Val Ala Gly Asn Asp Leu Phe Val
 65 70 75 80
 Pro Leu His Asp Gln Asn Glu Gly Glu Glu Pro Val Met Val Gln Gly
 85 90 95
 Ala Leu Leu Arg Ile Phe Glu Asn Ile Tyr Ser Asp Pro Ser Phe Gln
 100 105 110
 Asn Gln Val Ser Phe Leu Pro Cys Gln Ser Ile Ile Phe Thr Gly His
 115 120 125
 Ser Ile Gly Gly Thr Ala Ala Ser Leu Ala Ala Leu Trp Leu Leu Ser
 130 135 140
 Tyr Leu Gln Ser Asn Ser Pro Asn Leu Ser Val Leu Cys Ile Thr Phe
 145 150 155 160
 Gly Ser Pro Leu Leu Gly Asn Glu Thr Leu Ser Arg Ala Ile Leu Arg
 165 170 175
 Glu Arg Trp Gly Gly Lys Phe Cys His Val Val Ser Lys Leu Val Glu
 180 185 190
 Ala Gly Glu Glu Ala Val Thr Gly Val Phe Arg Pro Phe Gly Asn Tyr
 195 200 205
 Phe Phe Cys Ser Glu Asp Gly Ala Ile Cys Val Asp Asn Val Glu Ser
 210 215 220
 Val Ile Lys Met Met Tyr Leu Leu Leu Ala Thr Gly Ser Pro Ser Tyr
 225 230 235 240
 Ser Ile Glu Asp His Leu Lys Tyr Gly Asp Tyr Val Glu Arg Ile Ser
 245 250 255
 Ser Gln Phe Leu Glu Arg Lys Ser Ser Met Glu Gly Glu Leu Pro Glu
 Page 13

P0101WOASequenceListing
 265 270

260

Ser Ser Tyr Glu Ala Gly Val Val Leu Ala Leu Gln Ser Ser Gly Ile
 275 280 285

Ala Ser Gln Val Met Leu Ser Ile Arg Ile Thr Lys Asp Cys Leu Lys
 290 295 300

Ala Ala Arg Arg Met Gly Arg Thr Pro Asn Leu Asn Cys Ala Asn Leu
 305 310 315 320

Ala Ile Lys Leu Ser Arg Ile Asn Pro Tyr Arg Ala Glu Ile Glu Trp
 325 330 335

Tyr Lys Ala Leu Cys Asp Arg Ser Asp Asp Gln Met Gly Tyr Tyr Asp
 340 345 350

Ser Phe Lys Arg Arg Gly Ala Ser Lys Arg Asp Phe Lys Val Asn Leu
 355 360 365

Asn Arg His Lys Leu Ala Gln Phe Trp Asp Asn Val Ile Asp Leu Met
 370 375 380

Glu Ser Asn Gln Leu Pro His Asp Phe His Lys His Gly Lys Trp Val
 385 390 400

Tyr Ser Ser Gln Ser Tyr Lys Leu Leu Val Glu Pro Leu Asp Ile Ala
 405 410 415

Glu Tyr Tyr Arg Thr Gly Met His His Ser Lys Gly His Tyr Ile Asn
 420 425 430

His Gly Arg Glu Arg Arg Tyr Gln Ile Phe Asp Arg Trp Trp Lys Asn
 435 440 445

Val Arg Val Glu Glu Asn Lys Arg Ser Lys Phe Ala Ser Leu Thr Gln
 450 455 460

Asp Thr Cys Phe Trp Ala Lys Val Glu Glu Ala Arg Gly Leu Leu Asp
 465 470 475 480

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

Asn Met Asp Gly Phe Ala Asn Tyr Ala Lys Ala Leu Val Glu Ala Lys
 500 505 510

P0101WOASequenceListing

Glu Val Ser Ile Asp Val Val Ala Lys Asn Ser Ser Tyr Ser Leu Trp
 515 520 525

Leu Lys Asp Tyr Asn Glu Leu Lys
 530 535

<210> 11
 <211> 174
 <212> PRT
 <213> Populus Trichocarpa Predicted Protein for Lesion Simulating Disease 1
 <400> 11

Met Gln Ser Gln Val Val Cys Arg Gly Cys Ala Ser Val Leu Leu Tyr
 1 5 10 15

Pro Ser Gly Ala Ser Asn Val Cys Cys Ala Leu Cys Ser Thr Val Thr
 20 25 30

Ser Ile Pro Ser Pro Gly Met Asp Met Ala Gln Leu Ile Cys Arg Gly
 35 40 45

Cys Arg Ser Leu Leu Met Tyr Pro His Gly Ala Thr Thr Val Arg Cys
 50 55 60

Ser Cys Cys His Val Val Asn Ile Ala Pro Gly Tyr Asn Gln Ala Ala
 65 70 75 80

His Val Asn Cys Gly Asn Cys Arg Thr Ala Leu Met Tyr Pro Asn Gly
 85 90 95

Ser Pro Ser Val Lys Cys Pro Val Cys His Tyr Val Thr Asn Val Ser
 100 105 110

Met Ala Asn Met Arg Ile Pro Leu Pro Ala Asn Arg Pro Asn Gly Ile
 115 120 125

Gly Gly Thr Ala Pro Ser Thr Ser Met Pro Leu Pro His Ser Gln Thr
 130 135 140

Gln Thr Val Val Val Glu Asn Pro Met Ser Val Asp Glu Ser Gly Lys
 145 150 155 160

Leu Val Ser Asn Val Val Val Gly Val Thr Thr Glu Lys Lys
 165 170

<210> 12
 <211> 588
 <212> PRT
 <213> Populus Trichocarpa Enhanced Disease Susceptibility 1
 Page 15

P0101WOASequenceListing

<400> 12

Met Gly Ile Val Lys Leu Gly Glu Asn Met Glu Ile Lys Glu Glu Val
1 5 10 15

Ile Met Lys Ala Cys Ser Met Ala Met Lys Ala His Lys Ser Pro Glu
20 25 30

Lys Gln Tyr Leu Ser Glu Gly Ile His Ser Ser Ser Ser Glu Val Val
35 40 45

Phe Ser Phe Ala Gly Ser Leu Ser Val Asn Asp Trp Phe Ala Gly Ser
50 55 60

Ala Phe Gly Glu Met Lys Val Asp Leu Gln Phe Phe Pro Ser Leu Lys
65 70 75 80

Tyr Val Gly Leu Asp Gln Thr Gly Arg Val Asn Glu Ala Phe Phe Lys
85 90 95

Arg Phe Glu Ala Val Leu Ala Asn Pro Arg Phe Lys Val Glu Val Glu
100 105 110

Lys Ala Val Ala Asp Arg Arg Gln Val Val Phe Thr Gly His Ser Ser
115 120 125

Gly Gly Ala Ile Ala Ile Leu Ala Thr Ala Trp Phe Leu Glu Val Tyr
130 135 140

Asn Arg Gln Ser Ser Asn Cys Met Ala Pro Leu Cys Leu Thr Phe Gly
145 150 155 160

Ser Pro Leu Val Gly Asp Tyr Ile Ile Asn Ile Ala Ile Arg Arg Glu
165 170 175

Lys Trp Ser Arg Tyr Phe Val Asn Phe Val Met Arg Tyr Asp Ile Val
180 185 190

Pro Arg Ile Ser Leu Cys Pro Leu Ser Ser Ile Lys Gln Gln Leu Gln
195 200 205

Arg Val Leu Asp Tyr Phe Asn Gln Asn Ala Pro Gln Pro Pro Asn Asp
210 215 220

Ala Pro Ala Phe Tyr Glu Thr Val Val Lys Asn Ala Ser Ser Val Ala
225 230 235 240

P0101WOASequenceListing

Asn Tyr Ala Ala Cys Lys Ile Met Gly Ser Thr Asn Pro Leu Leu Glu
 245 250 255

Thr Val Ser Ser Phe Ile Glu Pro Ser Pro Tyr Arg Pro Phe Gly Thr
 260 265 270

Tyr Val Phe Cys Thr Gly Thr Gly Lys Leu Val Val Ile Ser Asn Pro
 275 280 285

Asp Ala Val Leu Gln Val Leu Phe Tyr Ser Ser Gln Leu Ser Thr Glu
 290 295 300

Glu Glu Lys Val Thr Val Ala Gln Thr Ser Leu Arg Asp His Leu Asn
 305 310 315 320

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

Leu Phe His His Arg Gln Glu Ala Leu Ala Val Ser Trp Asn Val Ala
 340 345 350

Ser Val Glu Arg Glu Lys Val Asp Met Ala Leu Asn Asp Leu Gly Leu
 355 360 365

Ser Glu Arg Ala Arg Leu Ser Leu Arg Ala Ala Glu Ala Leu Glu Lys
 370 375 380

Gln Lys Leu Arg Asn Gln Asp Thr Ile Asp Gly Lys Lys Lys Asp Ile
 385 390 395 400

Glu Lys Cys Leu Asp Lys Leu Gln Glu Tyr Gln Ser Lys Cys Ala His
 405 410 415

Lys Val Gly Tyr Tyr Asp Ala Phe Lys Cys Ser Glu Glu Glu Glu Asp
 420 425 430

Phe His Ala Asn Val Ala Arg Leu Glu Leu Ala Gly Thr Trp Asp Val
 435 440 445

Ile Ile Glu Met Leu Lys Arg Tyr Glu Leu Pro Asp Glu Phe Glu Gly
 450 455 460

Gln Lys Glu Trp Ile Gly Leu Gly Thr Arg Tyr Arg Arg Ile Val Glu
 465 470 475 480

Pro Leu Asp Ile Ala Asn Tyr Tyr Arg His Leu Lys Asn Glu Asp Thr
 485 490 495

P0101WOASequenceListing

Gly Pro Tyr Met Gly Lys Gly Arg Pro Arg Arg Tyr Lys Cys Thr Gln
500 505 510

Lys Trp Arg Glu His Ala Glu Gln Leu Pro Asn Glu Ile Pro Glu Ser
515 520 525

Cys Phe Trp Ala Glu Val Glu Glu Leu Cys Ile Lys Ala Gly Cys Gln
530 535 540 545

Gly Thr Ile Glu Ser Ile Leu His Leu Lys Thr Lys Val Asp Lys Trp
545 550 555 560

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

Phe Thr Lys Leu Gln Lys Gln His Phe Leu Thr Asn
580 585