

PhoenixTemp26787.tmp.txt  
SEQUENCE LISTING

<110> BASF Plant Science GmbH  
Wiig, Aaron

<120> Compositions and Methods Using RNA Interference of OPR3-Like

<130> PF 58862

<160> 30

<170> PatentIn version 3.4

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Thr Ser Ser Gly Phe Pro His Val Pro Gly Ile Tyr Ser Asp Glu Gln  
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Ser Glu Lys Glu Glu Ala His Phe Met Gln Lys Trp Arg Glu Ala Tyr  
290 295 300

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

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

His Ala Lys Gly Gly Phe Ile Phe Cys Gln Leu Trp His Val Gly Arg  
100 105 110

Ala Ser His Ala Val Tyr Gln Pro Asn Gly Gly Ser Pro Ile Ser Ser  
115 120 125

Thr Asn Lys Pro Ile Ser Glu Asn Arg Trp Arg Val Leu Leu Pro Asp  
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Gly Ser His Val Lys Tyr Pro Lys Pro Arg Ala Leu Glu Ala Ser Glu  
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Ile Pro Arg Val Val Glu Asp Tyr Cys Leu Ser Ala Leu Asn Ala Ile  
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180 185 190

Ile Asp Gln Phe Leu Lys Asp Gly Ile Asn Asp Arg Thr Asp Gln Tyr  
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gaagaggaag ctagattaat gagaacttgg agaagggtt ataagggaac tttcatctgt 960  
agcgggtgggt tcacgaggga gctaggaatg gaagctatag ctcaagatga tgcagatttg 1020  
gtatcttatg gccgactttt tatttcaaac ccagacttag tcttgagatt taagctcaat 1080  
gcgcccttga ataagtatgt caggaaaaca ttctacaccc aagatcctgt tgttgggtac 1140  
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<210> 12  
<211> 399  
<212> PRT  
<213> Hevea brasiliensis

<400> 12

Met Ala Glu Thr Gly Thr Glu Gly Thr Gly Ile Thr Thr Leu Phe Ser  
1 5 10 15

Pro Tyr Lys Met Gly Lys Phe Ser Leu Ser His Arg Val Val Leu Ala  
20 25 30

Pro Met Thr Arg Cys Arg Ala Leu Asn Gly Ile Pro Asn Ala Ala Leu  
35 40 45

Val Asp Tyr Tyr Thr Gln Arg Ser Thr Pro Gly Gly Phe Leu Ile Thr  
50 55 60

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

Gly Ile Tyr Thr Glu Glu Gln Ala Glu Ala Trp Lys Arg Val Val Asp  
85 90 95

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

Gly Arg Ala Ser His Gln Val Tyr Gln Pro Asn Gly Ala Ala Pro Ile  
115 120 125

Ser Ser Thr Gly Lys Ala Ile Ser Asn Arg Trp Arg Ile Leu Met Pro  
130 135 140

Asp Gly Ser Tyr Gly Lys Tyr Pro Thr Pro Arg Pro Leu Glu Thr Pro  
145 150 155 160

Glu Ile Leu Glu Val Val Lys Asn Tyr Arg Gln Ser Ala Leu Asn Ala  
165 170 175

Ile Arg Ala Gly Phe Asp Gly Ile Glu Val His Gly Ala His Gly Tyr  
180 185 190

PhoenixTemp26787.tmp.txt

Leu Ile Asp Gln Phe Leu Lys Asp Gly Ile Asn Asp Arg Thr Asp Glu  
195 200 205

Tyr Gly Gly Ser Ile Asn Asn Arg Cys Arg Phe Leu Met Gln Val Ile  
210 215 220

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

Ser Pro Ala Ile Asp His Leu Asp Ala Ile Asp Ser Asp Pro Leu Asn  
245 250 255

Leu Gly Leu Ala Val Ile Glu Arg Leu Asn Lys Leu Gln Leu Asn Leu  
260 265 270

Gly Ser Lys Leu Thr Tyr Leu His Val Thr Gln Pro Arg Tyr Thr Ala  
275 280 285

Tyr Gly Gln Thr Glu Ser Gly Arg His Gly Thr Glu Glu Glu Glu Ala  
290 295 300

Arg Leu Met Arg Thr Trp Arg Arg Ala Tyr Lys Gly Thr Phe Ile Cys  
305 310 315 320

Ser Gly Gly Phe Thr Arg Glu Leu Gly Met Glu Ala Ile Ala Gln Asp  
325 330 335

Asp Ala Asp Leu Val Ser Tyr Gly Arg Leu Phe Ile Ser Asn Pro Asp  
340 345 350

Leu Val Leu Arg Phe Lys Leu Asn Ala Pro Leu Asn Lys Tyr Val Arg  
355 360 365

Lys Thr Phe Tyr Thr Gln Asp Pro Val Val Gly Tyr Thr Asp Tyr Pro  
370 375 380

Phe Phe Arg Lys Val Asp Gly Ser Gln Glu Pro Arg Ser Arg Leu  
385 390 395

<210> 13  
<211> 1185  
<212> DNA  
<213> Oryza sativa

<400> 13  
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gcgatcggcg gggtgcccgg cccggcgctg gcggagtact acgctcagcg gaccaccag 180  
ggtggcctgc tcatctccga gggcaccgtc gtctcgcccc ctggcccggg gtttcctcat 240  
gtccctggga tataaatca agagcagact gatgcatgga agaaggtggt ggatgctgtt 300

PhoenixTemp26787.tmp.txt

catgccaagg gaggcattctt tttctgccag ttatggcatg taggcagagc ttctcaccaa 360  
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tggaataac tgatgcctga tggctcctat ggcaagtatc ctaaacctag gcgcctggca 480  
gcatcggaat tacctgaaat tgtcgaacaa tatcgtcaag ccgccattaa tgccattgaa 540  
gcaggttttg atggcattga gatccatggt gctcatggct atatcattga tcaattccta 600  
aaggatggaa tcaatgaccg cactgacgag tatgggtggct cactttccaa ccgctgccgg 660  
ttcctacttg aggtaactag ggctgtgggt tctgccattg gagcagaccg agtcgcggtg 720  
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atggccgttg ttgagcggct gaatgctctc cagcagcagt caggcgggct cgcctacctc 840  
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gccgaggagg agagccgcct gatgcgcacc ctccggggca cgtaccaggg cacattcatg 960  
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aacgccgggc tgaacaagta cgtgcgaag acattctaca cggccgatcc tgctgtgggt 1140  
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<210> 14  
<211> 394  
<212> PRT  
<213> Oryza sativa

<400> 14

Met Asp Arg Pro Pro Pro Asp Gln Gln Arg Gln Lys Gln Ala Pro Leu  
1 5 10 15

Phe Ser Pro Tyr Gln Met Pro Arg Phe Arg Leu Asn His Arg Val Val  
20 25 30

Leu Ala Pro Met Thr Arg Cys Arg Ala Ile Gly Gly Val Pro Gly Pro  
35 40 45

Ala Leu Ala Glu Tyr Tyr Ala Gln Arg Thr Thr Gln Gly Gly Leu Leu  
50 55 60

Ile Ser Glu Gly Thr Val Val Ser Pro Ala Gly Pro Gly Phe Pro His  
65 70 75 80

Val Pro Gly Ile Tyr Asn Gln Glu Gln Thr Asp Ala Trp Lys Lys Val  
85 90 95

Val Asp Ala Val His Ala Lys Gly Gly Ile Phe Phe Cys Gln Leu Trp  
100 105 110

His Val Gly Arg Ala Ser His Gln Val Tyr Gln Pro Asn Gly Ala Ala  
115 120 125

PhoenixTemp26787.tmp.txt

Pro Ile Ser Ser Thr Asp Lys Pro Ile Ser Ala Arg Trp Arg Ile Leu  
130 135 140

Met Pro Asp Gly Ser Tyr Gly Lys Tyr Pro Lys Pro Arg Arg Leu Ala  
145 150 155 160

Ala Ser Glu Ile Pro Glu Ile Val Glu Gln Tyr Arg Gln Ala Ala Ile  
165 170 175

Asn Ala Ile Glu Ala Gly Phe Asp Gly Ile Glu Ile His Gly Ala His  
180 185 190

Gly Tyr Ile Ile Asp Gln Phe Leu Lys Asp Gly Ile Asn Asp Arg Thr  
195 200 205

Asp Glu Tyr Gly Gly Ser Leu Ser Asn Arg Cys Arg Phe Leu Leu Glu  
210 215 220

Val Thr Arg Ala Val Val Ser Ala Ile Gly Ala Asp Arg Val Ala Val  
225 230 235 240

Arg Ile Ser Pro Ala Ile Asp His Leu Asp Ala Tyr Asp Ser Asp Pro  
245 250 255

Ile Lys Leu Gly Met Ala Val Val Glu Arg Leu Asn Ala Leu Gln Gln  
260 265 270

Gln Ser Gly Arg Leu Ala Tyr Leu His Val Thr Gln Pro Arg Tyr Thr  
275 280 285

Ala Tyr Gly Gln Thr Glu Ser Gly Gln His Gly Ser Ala Glu Glu Glu  
290 295 300

Ser Arg Leu Met Arg Thr Leu Arg Gly Thr Tyr Gln Gly Thr Phe Met  
305 310 315 320

Cys Ser Gly Gly Tyr Thr Arg Glu Leu Gly Leu Glu Ala Val Glu Ser  
325 330 335

Gly Asp Ala Asp Leu Val Ser Tyr Gly Arg Leu Phe Ile Ser Asn Pro  
340 345 350

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

Arg Lys Thr Phe Tyr Thr Pro Asp Pro Val Val Gly Tyr Thr Asp Tyr  
370 375 380

Pro Phe Leu Gly Gln Pro Lys Ser Arg Met  
385 390

PhoenixTemp26787.tmp.txt

<210> 15  
 <211> 1200  
 <212> DNA  
 <213> Zea mays

<400> 15  
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 atgaccaggt gcagggcgcc cgagcggtc ccaggccccg cgctcgcgga gtactacgcg 180  
 cagcgggtcca cggacggcgg cttgctcatc tccgagggca ccatcatctc gccgtccggc 240  
 cctgggttcc ctcggtgtcc tgggatatac aatcaagaac agactgatgc atggagaaag 300  
 gtggttgatg ctgttcatgc caaggagct atctttttct gccaactatg gcatgtaggc 360  
 cgagcttctc accaagtata tcagccgggt gctgctgctc cgatatcctc aactgataag 420  
 ccaatatcat caagatggag gatactgatg cccgatggat cctatggcaa gtatccaact 480  
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 gaccgcgtcg cgggtccgagt gtccccggcc atcgaccatc tcgacgccta cgactccaac 780  
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 ggccagcacg ggagtgccga ggaggagagc cggctgatgc gtgccgtgcg aggtgcctac 960  
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<210> 16  
 <211> 399  
 <212> PRT  
 <213> Zea mays

<400> 16

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

Lys Arg Pro Ser Leu Phe Ser Pro Tyr Gln Met Pro Arg Phe Arg Leu  
 20 25 30

Ala His Arg Val Val Leu Ala Pro Met Thr Arg Cys Arg Ala Pro Asp  
 35 40 45

Ala Val Pro Gly Pro Ala Leu Ala Glu Tyr Tyr Ala Gln Arg Ser Thr  
 50 55 60

PhoenixTemp26787.tmp.txt

Asp Gly Gly Leu Leu Ile Ser Glu Gly Thr Ile Ile Ser Pro Ser Gly  
 65 70 75 80  
 Pro Gly Phe Pro Arg Val Pro Gly Ile Tyr Asn Gln Glu Gln Thr Asp  
 85 90 95  
 Ala Trp Arg Lys Val Val Asp Ala Val His Ala Lys Gly Ala Ile Phe  
 100 105 110  
 Phe Cys Gln Leu Trp His Val Gly Arg Ala Ser His Gln Val Tyr Gln  
 115 120 125  
 Pro Gly Ala Ala Ala Pro Ile Ser Ser Thr Asp Lys Pro Ile Ser Ser  
 130 135 140  
 Arg Trp Arg Ile Leu Met Pro Asp Gly Ser Tyr Gly Lys Tyr Pro Thr  
 145 150 155 160  
 Pro Arg Arg Leu Ala Thr Ser Glu Ile Pro Glu Ile Val Glu Gln Tyr  
 165 170 175  
 Arg Gln Ala Ala Val Asn Ala Ile Lys Ala Gly Phe Asp Gly Ile Glu  
 180 185 190  
 Ile His Gly Ala His Gly Tyr Leu Ile Asp Gln Phe Leu Lys Gly Gly  
 195 200 205  
 Ile Asn Asp Arg Thr Asp Glu Tyr Gly Gly Ser Leu Ser Asn Arg Cys  
 210 215 220  
 Arg Phe Leu Leu Glu Val Thr Arg Ala Val Val Ser Ala Ile Gly Ala  
 225 230 235 240  
 Asp Arg Val Ala Val Arg Val Ser Pro Ala Ile Asp His Leu Asp Ala  
 245 250 255  
 Tyr Asp Ser Asn Pro Leu Gln Leu Gly Leu Ala Val Val Glu Arg Leu  
 260 265 270  
 Asn Ala Leu Gln Gln Glu Ala Gly Arg Leu Ala Tyr Leu His Val Thr  
 275 280 285  
 Gln Pro Arg Tyr Thr Ala Tyr Gly Gln Thr Glu Ser Gly Gln His Gly  
 290 295 300  
 Ser Ala Glu Glu Glu Ser Arg Leu Met Arg Ala Val Arg Gly Ala Tyr  
 305 310 315 320  
 Arg Gly Thr Phe Met Cys Ser Gly Gly Tyr Thr Arg Glu Leu Gly Val  
 325 330 335



PhoenixTemp26787.tmp.txt

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

Phe Ile Ala Asn Pro Asp Leu Val Glu Arg Phe Arg Arg Asp Ala Pro  
355 360 365

Leu Asn Lys Tyr Val Arg Lys Thr Phe Tyr Thr Pro Asp Pro Val Val  
370 375 380

Gly Tyr Thr Asp Tyr Thr Phe Leu Gly Gln Pro Lys Ala Arg Met  
385 390 395

<210> 17  
<211> 1200  
<212> DNA  
<213> Zea mays

<400> 17  
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atgaccaggt gccgggccc cgtatcgctc ccggggcccc cgctcgcgga gtactacgcg 180  
cagcgggtcca cggaaggcgg cttgctcatc tccgagggca ccatcatctc gcccgccggc 240  
cctgggttcc ctcgtgtccc tgggatatac aatcaagagc agactgatgc atggaaaaag 300  
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cgagcttctc accaagtata tcagccgggt ggttctgctc caatatcctc tactgataaa 420  
ccaatatcat caagatggag gatactgatg cccgatggat cctatggcaa gtatccaact 480  
ccgaggcgcc tagccacatc cgagatacca gaaattgtcg agcaataccg acaggctgcc 540  
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tccaaccgct gccggttcct cctggagggtg acccgcgccg tgggtctccg gataggggca 720  
gaccgggtgg cgggtccgggt gtccccggcc atcgaccacc tcgacgcgta cgactccaac 780  
ccgctgcagc tcggcctggc cgtagtggac cgcctcaacg ctctccagga ggagaccggg 840  
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tcgtgggacg ccgacctggt gtcctacggg cggctgttca tcgctaaccg ggacctggtg 1080  
gagcgggtcc ggcgcgacgc cccgctgaac agatacgtgc gcaagacgtt ctacaccccg 1140  
gatcccgtcg ttggttacac ggactacccg ttcctcggcc agcctaaggc gcgcatgtga 1200

<210> 18  
<211> 399  
<212> PRT  
<213> Zea mays

&lt;400&gt; 18

Met Ala Ser Thr Asp Arg Ser Ala Pro Ala Glu Asp Gln Gln Gln Pro  
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 Gln Arg Pro Ser Leu Phe Ser Pro Tyr Gln Met Pro His Phe Arg Leu  
 20 25 30  
 Ala His Arg Val Val Leu Ala Pro Met Thr Arg Cys Arg Ala Pro Asp  
 35 40 45  
 Ala Leu Pro Gly Pro Ala Leu Ala Glu Tyr Tyr Ala Gln Arg Ser Thr  
 50 55 60  
 Glu Gly Gly Leu Leu Ile Ser Glu Gly Thr Ile Ile Ser Pro Ala Gly  
 65 70 75 80  
 Pro Gly Phe Pro Arg Val Pro Gly Ile Tyr Asn Gln Glu Gln Thr Asp  
 85 90 95  
 Ala Trp Lys Lys Val Val Asp Ala Val His Ala Lys Gly Ala Ile Phe  
 100 105 110  
 Phe Cys Gln Leu Trp His Val Gly Arg Ala Ser His Gln Val Tyr Gln  
 115 120 125  
 Pro Gly Gly Ser Ala Pro Ile Ser Ser Thr Asp Lys Pro Ile Ser Ser  
 130 135 140  
 Arg Trp Arg Ile Leu Met Pro Asp Gly Ser Tyr Gly Lys Tyr Pro Thr  
 145 150 155 160  
 Pro Arg Arg Leu Ala Thr Ser Glu Ile Pro Glu Ile Val Glu Gln Tyr  
 165 170 175  
 Arg Gln Ala Ala Ile Asn Ala Ile Lys Ala Gly Phe Asp Gly Ile Glu  
 180 185 190  
 Ile His Gly Ala His Gly Tyr Leu Ile Asp Gln Phe Leu Lys Asp Gly  
 195 200 205  
 Ile Asn Asp Arg Ala Asp Glu Tyr Gly Gly Ser Leu Ser Asn Arg Cys  
 210 215 220  
 Arg Phe Leu Leu Glu Val Thr Arg Ala Val Val Ser Ala Ile Gly Ala  
 225 230 235 240  
 Asp Arg Val Ala Val Arg Val Ser Pro Ala Ile Asp His Leu Asp Ala  
 245 250 255  
 Tyr Asp Ser Asn Pro Leu Gln Leu Gly Leu Ala Val Val Asp Arg Leu  
 260 265 270

PhoenixTemp26787.tmp.txt

Asn Ala Leu Gln Glu Glu Thr Gly Arg Leu Ala Tyr Leu His Val Thr  
275 280 285

Gln Pro Arg Tyr Thr Ala Tyr Gly Gln Thr Glu Ser Gly Gln His Gly  
290 295 300

Ser Ala Glu Glu Glu Ser Arg Leu Met Arg Ala Leu Arg Gly Ala Tyr  
305 310 315 320

Arg Gly Thr Phe Met Cys Ser Gly Gly Tyr Thr Arg Glu Leu Gly Val  
325 330 335

Glu Ala Val Glu Ser Trp Asp Ala Asp Leu Val Ser Tyr Gly Arg Leu  
340 345 350

Phe Ile Ala Asn Pro Asp Leu Val Glu Arg Phe Arg Arg Asp Ala Pro  
355 360 365

Leu Asn Arg Tyr Val Arg Lys Thr Phe Tyr Thr Pro Asp Pro Val Val  
370 375 380

Gly Tyr Thr Asp Tyr Pro Phe Leu Gly Gln Pro Lys Ala Arg Met  
385 390 395

<210> 19  
<211> 762  
<212> DNA  
<213> Arachis hypogaea

<400> 19  
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tcgcacaggg tgggtgttggc gcccatgacc aggtgcagag ccttgaacgg catcccacgt 120  
gccgctcacg cggagtatta cgctcagaga tccacacccg gtggattcct catcaccgaa 180  
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ttctgtcaac tctggcatgc tggccgtgca tctcatcccg tgtatcagcc tggggcggcg 360  
ccgcccattt cctccacaaa caaggctatt tcctccagat ggagaattct cttgccggat 420  
cagtcctacg gcgtgtatcc agagccccga ccacttgact cttctgagat accacaaata 480  
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gcagttgttt ctgcaattgg agcagaaaga gtaggtgtta gaatctcacc ggcaatcgac 720  
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<210> 20  
<211> 250  
<212> PRT

&lt;213&gt; Arachis hypogaea

&lt;400&gt; 20

Met Ala Asp Asn Glu Ser Ser Ser Leu Phe Ser Ala Tyr Lys Met Ala  
 1 5 10 15

Lys Phe Ser Leu Ser His Arg Val Val Leu Ala Pro Met Thr Arg Cys  
 20 25 30

Arg Ala Leu Asn Gly Ile Pro Arg Ala Ala His Ala Glu Tyr Tyr Ala  
 35 40 45

Gln Arg Ser Thr Pro Gly Gly Phe Leu Ile Thr Glu Gly Thr Leu Ile  
 50 55 60

Ser Pro Thr Ala Pro Gly Phe Pro His Val Pro Gly Ile Tyr Ser Glu  
 65 70 75 80

Glu Gln Val Glu Ala Trp Arg Asn Val Val Asp Ala Val His Ala Lys  
 85 90 95

Gly Ser Phe Ile Phe Cys Gln Leu Trp His Ala Gly Arg Ala Ser His  
 100 105 110

Pro Val Tyr Gln Pro Gly Ala Ala Pro Pro Ile Ser Ser Thr Asn Lys  
 115 120 125

Ala Ile Ser Ser Arg Trp Arg Ile Leu Leu Pro Asp Gln Ser Tyr Gly  
 130 135 140

Val Tyr Pro Glu Pro Arg Pro Leu Asp Ser Ser Glu Ile Pro Gln Ile  
 145 150 155 160

Val Asp His Tyr Arg Gln Ser Ala Val Asn Ala Ile Arg Ala Gly Phe  
 165 170 175

Asp Gly Ile Glu Ile His Gly Ala His Gly Tyr Leu Ile Asp Gln Phe  
 180 185 190

Leu Lys Asp Gly Ile Asn Glu Arg Arg Asp Glu Tyr Gly Gly Ser Ile  
 195 200 205

Ser Asn Arg Cys Arg Phe Leu Met Gln Val Val Lys Ala Val Val Ser  
 210 215 220

Ala Ile Gly Ala Glu Arg Val Gly Val Arg Ile Ser Pro Ala Ile Asp  
 225 230 235 240

His Leu Asp Ala Met Asp Ser Asp Pro Leu  
 245 250

&lt;210&gt; 21

## PhoenixTemp26787.tmp.txt

&lt;211&gt; 1203

&lt;212&gt; DNA

&lt;213&gt; Solanum tuberosum

&lt;400&gt; 21

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aagatggcaa agttcaatct atcccacagg atagtattgg ctccgatgac aaggtgcaga      120
gcattgaata atattccttc ggcggcgctg ggggaatatt acgagcagag agcgacggcc      180
ggtggatttc tgatcactga aggcaactat atttctccga cttcagctgg gtttcctcat      240
gtgccaggga ttttcacaaa ggagcaagta gaggaatgga agaaaatagt tgatgtagtg      300
catgcaaagg gtgctgtcat attttgtcag ttgtggcatg ttggtcgtgc atctcatgaa      360
gtgtatcaac ctgctggagc tgcaccaata tcatctactg agaagcctat atcaaagagg      420
tggaagaattc tgatgcctga tggaaactcat gggatttatc caaaaccaag agcaattgga      480
acctatgaga tctcacaaagt ggttgaagat tattgcaggt cggccttgaa tgctattgaa      540
gcagggttttg atggtattga aatccatgga gctcacgggt acttgattga ccaattcttg      600
aaagatggga tcaatgaccg gacagatgag tatggtggat cactagccaa ccggtgcaaa      660
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agagtttcac cagcaataga tcattctgat gccatggact ctaatccact cagcctaggc      780
ttagcagttg ttgaaagact aaacaaaatc caactccatt ctggttccaa gcttgcctat      840
cttcatgtaa cacagccacg atacgtagca tatgggcaaa ccgaagcagg cagacttggc      900
agtgaagagg aggaggcgca tttaatgagg actttgagga acgcatatca ggggacattc      960
atttgcagtg gtggatacac tagggagcta ggaattgagg ctgtggcaca aggtgatgct     1020
gatctcgtgt catatggacg tcttttcatt tctaactctg atttggttat gagaatcaag     1080
ctaaatgcac ctctaaataa gtataacagg aagacattct atactcaaga tccagttgtg     1140
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tga                                                                    1203

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&lt;210&gt; 22

&lt;211&gt; 400

&lt;212&gt; PRT

&lt;213&gt; Solanum tuberosum

&lt;400&gt; 22

```

Met Ala Lys Thr Thr Ser Ser Ser Ala Gln Asp Gly Ser Asn Pro Leu
1          5          10          15

```

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Phe Ser Pro Tyr Lys Met Ala Lys Phe Asn Leu Ser His Arg Ile Val
          20          25          30

```

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Leu Ala Pro Met Thr Arg Cys Arg Ala Leu Asn Asn Ile Pro Ser Ala
          35          40          45

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Ala Leu Gly Glu Tyr Tyr Glu Gln Arg Ala Thr Ala Gly Gly Phe Leu
          50          55          60

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PhoenixTemp26787.tmp.txt

Ile Thr Glu Gly Thr Met Ile Ser Pro Thr Ser Ala Gly Phe Pro His  
65 70 75 80

Val Pro Gly Ile Phe Thr Lys Glu Gln Val Glu Glu Trp Lys Lys Ile  
85 90 95

Val Asp Val Val His Ala Lys Gly Ala Val Ile Phe Cys Gln Leu Trp  
100 105 110

His Val Gly Arg Ala Ser His Glu Val Tyr Gln Pro Ala Gly Ala Ala  
115 120 125

Pro Ile Ser Ser Thr Glu Lys Pro Ile Ser Lys Arg Trp Arg Ile Leu  
130 135 140

Met Pro Asp Gly Thr His Gly Ile Tyr Pro Lys Pro Arg Ala Ile Gly  
145 150 155 160

Thr Tyr Glu Ile Ser Gln Val Val Glu Asp Tyr Cys Arg Ser Ala Leu  
165 170 175

Asn Ala Ile Glu Ala Gly Phe Asp Gly Ile Glu Ile His Gly Ala His  
180 185 190

Gly Tyr Leu Ile Asp Gln Phe Leu Lys Asp Gly Ile Asn Asp Arg Thr  
195 200 205

Asp Glu Tyr Gly Gly Ser Leu Ala Asn Arg Cys Lys Phe Ile Thr Gln  
210 215 220

Val Val Gln Ala Val Ile Ser Ala Ile Gly Ala Asp Arg Val Gly Val  
225 230 235 240

Arg Val Ser Pro Ala Ile Asp His Leu Asp Ala Met Asp Ser Asn Pro  
245 250 255

Leu Ser Leu Gly Leu Ala Val Val Glu Arg Leu Asn Lys Ile Gln Leu  
260 265 270

His Ser Gly Ser Lys Leu Ala Tyr Leu His Val Thr Gln Pro Arg Tyr  
275 280 285

Val Ala Tyr Gly Gln Thr Glu Ala Gly Arg Leu Gly Ser Glu Glu Glu  
290 295 300

Glu Ala His Leu Met Arg Thr Leu Arg Asn Ala Tyr Gln Gly Thr Phe  
305 310 315 320

Ile Cys Ser Gly Gly Tyr Thr Arg Glu Leu Gly Ile Glu Ala Val Ala  
325 330 335

PhoenixTemp26787.tmp.txt

Gln Gly Asp Ala Asp Leu Val Ser Tyr Gly Arg Leu Phe Ile Ser Asn  
340 345 350

Pro Asp Leu Val Met Arg Ile Lys Leu Asn Ala Pro Leu Asn Lys Tyr  
355 360 365

Asn Arg Lys Thr Phe Tyr Thr Gln Asp Pro Val Val Gly Tyr Thr Asp  
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Tyr Pro Phe Leu Gln Gly Asn Gly Ser Asn Gly Pro Leu Ser Arg Leu  
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ccgatgctg ctcatgccac ttaccctaag cctagacgct tagaaacccc tgaaatcctc 480  
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ccccgttacg cagcatatgg ccaaaccgaa tctggcaaac ctggcagtga tgaagaggaa 900  
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Arg Cys Arg Ala Leu Asn Gly Leu Pro Gln Pro Ala Leu Ala Glu Tyr  
 35 40 45

Tyr Thr Gln Arg Ser Thr Asn Gly Gly Phe Leu Ile Thr Glu Gly Thr  
 50 55 60

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

Asn Asp Glu Gln Val Glu Ala Trp Lys Lys Val Val Asp Ala Val His  
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Ala Lys Gly Ala Ile Ile Phe Cys Gln Leu Trp His Val Gly Arg Ala  
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Ser His Glu Val Tyr Gln Pro Gly Gly Gly Ser Pro Ile Ser Ser Thr  
 115 120 125

Asp Val Pro Ile Ser Arg Arg Trp Arg Ile Leu Leu Pro Asp Ala Ser  
 130 135 140

His Ala Thr Tyr Pro Lys Pro Arg Arg Leu Glu Thr Pro Glu Ile Leu  
 145 150 155 160

Gln Val Val Glu His Tyr Arg Gln Ala Ala Leu Asn Ala Ile Arg Ala  
 165 170 175

Gly Phe Asp Gly Ile Glu Ile His Gly Ala His Gly Tyr Leu Ile Asp  
 180 185 190

Gln Phe Leu Lys Asp Gly Ile Asn Asp Arg Thr Asp Glu Tyr Gly Gly  
 195 200 205

Ser Leu Ala Asn Arg Cys Lys Phe Leu Leu Gln Val Val Gln Ala Val  
 210 215 220

Val Gly Ala Val Gly Ala Asp Arg Val Gly Val Arg Ile Ser Pro Ala  
 225 230 235 240

Ile Asp His Leu Asp Ala Val Asp Ser Ala Pro Leu Thr Leu Ser Leu  
 245 250 255

Gly Val Ile Glu Arg Leu Asn Lys Leu Gln Gln Asp Trp Gly Ser Lys  
 260 265 270



PhoenixTemp26787.tmp.txt

Leu Thr Tyr Leu His Val Thr Gln Pro Arg Tyr Ala Ala Tyr Gly Gln  
275 280 285

Thr Glu Ser Gly Lys Pro Gly Ser Asp Glu Glu Glu Ala Val Phe Met  
290 295 300

Arg Thr Leu Arg Asn Ala Tyr Arg Gly Thr Phe Val Ala Ser Gly Gly  
305 310 315 320

Tyr Thr Arg Glu Leu Gly Ile His Ala Val Ala Ser Arg Asp Ala Asp  
325 330 335

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

Arg Leu Lys Leu Asn Ala Pro Leu Thr Arg Tyr Asn Arg Lys Thr Phe  
355 360 365

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tgcagggcgt tgaatggaat tccaaggccg gcgcttgctg aatattacac gcagaggtcc 180  
actcctggcg gctttctcat cactgaagga acgttgatct ccgacactgg agcaggggtt 240  
ccacatgttc ctggaatcta caatgaagaa cagggtggagg catggaagat gattgtggat 300  
gctgttcatg ccaaaggggg catcattttc tgtcaactat ggcatgttgg ccgagcatct 360  
catacagtgt atcaacctgg cgagtgga ccaatatacct caacaaaca gcccatctca 420  
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PhoenixTemp26787.tmp.txt

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 20 25 30

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 35 40 45

Arg Pro Ala Leu Ala Glu Tyr Tyr Thr Gln Arg Ser Thr Pro Gly Gly  
 50 55 60

Phe Leu Ile Thr Glu Gly Thr Leu Ile Ser Asp Thr Gly Ala Gly Phe  
 65 70 75 80

Pro His Val Pro Gly Ile Tyr Asn Glu Glu Gln Val Glu Ala Trp Lys  
 85 90 95

Met Ile Val Asp Ala Val His Ala Lys Gly Gly Ile Ile Phe Cys Gln  
 100 105 110

Leu Trp His Val Gly Arg Ala Ser His Thr Val Tyr Gln Pro Gly Gly  
 115 120 125

Val Ala Pro Ile Ser Ser Thr Asn Lys Pro Ile Ser Lys Arg Trp Arg  
 130 135 140

Ile Leu Met Pro Asp Gly Ser Tyr Gly Ile Tyr Pro Lys Pro Arg Pro  
 145 150 155 160

Leu Glu Thr Ser Glu Ile Gln Glu Val Val Glu His Tyr Arg Lys Ala  
 165 170 175

Ala Leu Asn Ala Ile Arg Ala Gly Phe Asp Gly Ile Glu Ile His Gly  
 180 185 190

Ala His Gly Tyr Leu Ile Asp Gln Phe Leu Lys Asp Gly Ile Asn Asp  
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195

200

205

Arg Thr Asp Glu Tyr Gly Gly Ser Leu Ala Asn Arg Cys Lys Phe Leu  
 210 215 220

Met Gln Ile Val Gln Ala Val Ala Ser Ala Ile Gly Ile Asp Arg Val  
 225 230 235 240

Ala Val Arg Met Ser Pro Ala Ile Asp His Leu Asp Ala Thr Asp Ser  
 245 250 255

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

Gln Leu Gln Leu Gly Ser Lys Leu Ala Tyr Leu His Val Thr Gln Pro  
 275 280 285

Arg Tyr His Ala Tyr Gly Gln Thr Glu Ser Gly Lys His Gly Asn Glu  
 290 295 300

Asp Glu Glu Ala Tyr Leu Leu Arg Ala Leu Lys Arg Thr Tyr His Gly  
 305 310 315 320

Thr Phe Met Cys Ser Gly Gly Phe Asn Arg Glu Leu Gly Met Gln Ala  
 325 330 335

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

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

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 agcattcttc agcctgccat ggcggagtac tacgccc aaa gagcaaccaa tgggtggcttt 180  
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20 25 30

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35 40 45

Glu Tyr Tyr Ala Gln Arg Ala Thr Asn Gly Gly Phe Leu Ile Thr Glu  
50 55 60

Gly Thr Met Ile Ser Pro Ser Ala Ala Gly Phe Pro His Val Pro Gly  
65 70 75 80

Ile Phe Thr Lys Glu Gln Val Glu Ala Trp Lys Gln Val Val Asp Ala  
85 90 95

Val His Ala Lys Gly Ala Ile Ile Phe Cys Gln Leu Trp His Val Gly  
100 105 110

Arg Ala Ser His Glu Val Tyr Gln Pro Gly Gly Gly Ala Pro Ile Ser

115

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

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

Ile Glu Ala Gly Phe Asp Gly Ile Glu Ile His Gly Ala His Gly Tyr  
180 185 190

Leu Ile Asp Gln Phe Leu Lys Asp Gly Ile Asn Asp Arg Thr Asp Glu  
195 200 205

Tyr Gly Gly Ser Val Ala Asn Arg Cys Lys Phe Ile Val Gln Val Val  
210 215 220

Gln Ala Val Val Ser Ala Ile Gly Ala Asp Arg Val Gly Val Arg Ile  
225 230 235 240

Ser Pro Ala Ile Asp His Leu Asp Ala Met Asp Ser Asp Pro Leu Ser  
245 250 255

Leu Gly Leu Ala Val Ile Glu Arg Leu Asn Glu Leu Gln Leu Asn Ser  
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Gly Ser Lys Leu Thr Tyr Leu His Val Thr Gln Pro Arg Tyr Thr Ala  
275 280 285

Tyr Gly Gln Thr Glu Ala Gly Arg Gln Gly Ser Glu Glu Glu Glu Ala  
290 295 300

Gln Leu Val Arg Thr Leu Arg Lys Ala Tyr Gln Gly Thr Phe Ile Ser  
305 310 315 320

Ser Gly Gly Phe Thr Arg Glu Leu Gly Val Glu Ala Val Ala Gln Gly  
325 330 335

Asp Ala Asp Leu Val Ser Tyr Gly Arg Leu Phe Ile Ser Asn Pro Asp  
340 345 350

Leu Val Leu Arg Phe Lys Leu Asn Ala Pro Leu Ile Arg Tyr Asn Arg  
355 360 365

Ser Thr Phe Tyr Thr His Asp Pro Val Val Gly Tyr Thr Asp Tyr Pro  
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Phe Leu Ser Asn Gly Thr Ser Gly Asn Val Pro Gln Ser Arg Leu  
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## PhoenixTemp26787.tmp.txt

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aaa ttc aac ctc tct cat agg gtg gta ttg gct ccc atg acc aga tgc      96
Lys Phe Asn Leu Ser His Arg Val Val Leu Ala Pro Met Thr Arg Cys
                               20                25              30

aga gcg ctc aat ggg act cca ctg gca gca cat gct gaa tac tac gct     144
Arg Ala Leu Asn Gly Thr Pro Leu Ala Ala His Ala Glu Tyr Tyr Ala
                               35                40              45

cag aga tca aca ccg ggt gga ttt ctc atc act gaa ggc acc ttg atc     192
Gln Arg Ser Thr Pro Gly Gly Phe Leu Ile Thr Glu Gly Thr Leu Ile
                               50                55              60

tct cca act tct tct ggg ttt cct cat gtt cct gga ata tac tca gat     240
Ser Pro Thr Ser Ser Gly Phe Pro His Val Pro Gly Ile Tyr Ser Asp
65                               70                75              80

gaa cag gta gag gca tgg aga aat gta gtg gac gcc gtg cat gcc aac     288
Glu Gln Val Glu Ala Trp Arg Asn Val Val Asp Ala Val His Ala Asn
                               85                90              95

ggc agc ttt atc ttc tgt caa ctc tgg cat gtt ggc cgt gca tca cat     336
Gly Ser Phe Ile Phe Cys Gln Leu Trp His Val Gly Arg Ala Ser His
                               100               105              110

cca gtg tat cag cct ggt ggg gct cta ccc tct tcg tcc acc agc aaa     384
Pro Val Tyr Gln Pro Gly Gly Ala Leu Pro Ser Ser Ser Thr Ser Lys
                               115               120              125

ccc ata tca gac aag tgg aaa att ctc atg ccc gat ggc tcc cat ggc     432
Pro Ile Ser Asp Lys Trp Lys Ile Leu Met Pro Asp Gly Ser His Gly
                               130               135              140

atc tat cca gag cct cgt gca ctt acc act tct gag ata tct gaa ata     480
Ile Tyr Pro Glu Pro Arg Ala Leu Thr Thr Ser Glu Ile Ser Glu Ile
145                               150               155              160

gtg cat cat tat cgc caa gca gct att aat gca att cga gca ggt ttt     528
Val His His Tyr Arg Gln Ala Ala Ile Asn Ala Ile Arg Ala Gly Phe
                               165               170              175

gat gga atc gag att cat gga gca cat ggg tat ctc att gat caa ttc     576
Asp Gly Ile Glu Ile His Gly Ala His Gly Tyr Leu Ile Asp Gln Phe
                               180               185              190

tta aag gat gca atc aat gat aga aca gat gaa tac ggt gga cca cta     624
Leu Lys Asp Ala Ile Asn Asp Arg Thr Asp Glu Tyr Gly Gly Pro Leu
                               195               200              205

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PhoenixTemp26787.tmp.txt

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Ala Ile Gly Ala Glu Arg Val Ala Ile Arg Ile Ser Pro Ala Ile Asp	
225 230 235 240	
ttc aat gac gcc ttt gac tct gac cca ctt ggg cta ggc tta gca gtg	768
Phe Asn Asp Ala Phe Asp Ser Asp Pro Leu Gly Leu Gly Leu Ala Val	
245 250 255	
att gaa aga ctc aac aat ttg cag aaa caa gtg ggc aca aaa ctc gct	816
Ile Glu Arg Leu Asn Asn Leu Gln Lys Gln Val Gly Thr Lys Leu Ala	
260 265 270	
tat ctt cat gtt act cag cct cga ttc aca ctt ttg gcg caa acc gag	864
Tyr Leu His Val Thr Gln Pro Arg Phe Thr Leu Leu Ala Gln Thr Glu	
275 280 285	
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Ser Val Ser Glu Lys Glu Glu Ala His Phe Met Gln Lys Trp Arg Glu	
290 295 300	
gct tat gag gga aca ttc atg tgt agt gga gct ttt act agg gac tca	960
Ala Tyr Glu Gly Thr Phe Met Cys Ser Gly Ala Phe Thr Arg Asp Ser	
305 310 315 320	
gga atg gaa gct gta gct gaa ggc cat gct gat ttg gta tcc tat ggt	1008
Gly Met Glu Ala Val Ala Glu Gly His Ala Asp Leu Val Ser Tyr Gly	
325 330 335	
cgt ctt ttc atc tcc aat cca gac ttg gtt tta agg ctt aag ctc aat	1056
Arg Leu Phe Ile Ser Asn Pro Asp Leu Val Leu Arg Leu Lys Leu Asn	
340 345 350	
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Ala Pro Leu Thr Lys Tyr Asn Arg Asn Thr Phe Tyr Thr Gln Asp Pro	
355 360 365	
gtt ata ggc tac aca gat tat cct ttc ttt aat gga aca act gag aca	1152
Val Ile Gly Tyr Thr Asp Tyr Pro Phe Phe Asn Gly Thr Thr Glu Thr	
370 375 380	
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Lys Leu Ser Asn	
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Page 31

20

25

30

Arg Ala Leu<sub>35</sub> Asn Gly Thr Pro Leu<sub>40</sub> Ala Ala His Ala Glu<sub>45</sub> Tyr Tyr Ala

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Ser Pro Thr Ser Ser Gly<sub>70</sub> Phe Pro His Val Pro<sub>75</sub> Gly Ile Tyr Ser Asp<sub>80</sub>

Glu Gln Val Glu Ala<sub>85</sub> Trp Arg Asn Val Val<sub>90</sub> Asp Ala Val His Ala<sub>95</sub> Asn

Gly Ser Phe Ile<sub>100</sub> Phe Cys Gln Leu Trp His Val Gly Arg Ala Ser His<sub>110</sub>

Pro Val Tyr<sub>115</sub> Gln Pro Gly Gly Ala<sub>120</sub> Leu Pro Ser Ser Ser<sub>125</sub> Thr Ser Lys

Pro Ile<sub>130</sub> Ser Asp Lys Trp Lys<sub>135</sub> Ile Leu Met Pro Asp<sub>140</sub> Gly Ser His Gly

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Val His His Tyr Arg<sub>165</sub> Gln Ala Ala Ile Asn<sub>170</sub> Ala Ile Arg Ala Gly<sub>175</sub> Phe

Asp Gly Ile Glu<sub>180</sub> Ile His Gly Ala His<sub>185</sub> Gly Tyr Leu Ile Asp<sub>190</sub> Gln Phe

Leu Lys Asp<sub>195</sub> Ala Ile Asn Asp Arg<sub>200</sub> Thr Asp Glu Tyr Gly<sub>205</sub> Gly Pro Leu

Glu Asn<sub>210</sub> Arg Cys Arg Phe Leu<sub>215</sub> Met Glu Val Val Glu<sub>220</sub> Ala Val Val Ser

Ala Ile Gly Ala Glu Arg<sub>230</sub> Val Ala Ile Arg Ile<sub>235</sub> Ser Pro Ala Ile Asp<sub>240</sub>

Phe Asn Asp Ala Phe<sub>245</sub> Asp Ser Asp Pro Leu<sub>250</sub> Gly Leu Gly Leu Ala<sub>255</sub> Val

Ile Glu Arg Leu<sub>260</sub> Asn Asn Leu Gln Lys<sub>265</sub> Gln Val Gly Thr Lys<sub>270</sub> Leu Ala

Tyr Leu His<sub>275</sub> Val Thr Gln Pro Arg<sub>280</sub> Phe Thr Leu Leu Ala<sub>285</sub> Gln Thr Glu

Ser Val<sub>290</sub> Ser Glu Lys Glu Glu<sub>295</sub> Ala His Phe Met Gln<sub>300</sub> Lys Trp Arg Glu



PhoenixTemp26787.tmp.txt

Ala Tyr Glu Gly Thr Phe Met Cys Ser Gly Ala Phe Thr Arg Asp Ser  
305 310 315 320

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

Arg Leu Phe Ile Ser Asn Pro Asp Leu Val Leu Arg Leu Lys Leu Asn  
340 345 350

Ala Pro Leu Thr Lys Tyr Asn Arg Asn Thr Phe Tyr Thr Gln Asp Pro  
355 360 365

Val Ile Gly Tyr Thr Asp Tyr Pro Phe Phe Asn Gly Thr Thr Glu Thr  
370 375 380

Lys Leu Ser Asn  
385