

107369 seq_ST25.txt
SEQUENCE LISTING

<110> Nanyang Technological University
YOON, Ho-Sup
LIU, Ding-Xiang
NGUYEN, Quoc-Toan

<120> Anti-viral methods and the use of an Anti-viral agent

<130> P107369

<150> US61/682,932
<151> 2012-08-14

<160> 4

<170> PatentIn version 3.5

<210> 1
<211> 1599
<212> DNA
<213> Artificial Sequence

<220>
<223> cDNA sequence Singapore Mistletoe Lectin

<220>
<221> misc_feature
<222> (1)..(762)
<223> A-chain

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<222> (808)..(1599)
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gcgcttcggt atcccggcgg cagcacgcgc gcccaagctc gttccctttt agtcgtcatt 480
cagatgatct ccgaggcggc cagattcaat cccatcttct ggaggggttcg ccaaaacatt 540
aacagtgggg agtcgtttct gccagacatg tacatgctgg agctggagac gagttggggc 600
caacaatcca cgcaagtcca gcagtcacc gatggcggtt tcaatacccc aattcgcttg 660
gccctatcca ccggttaacta cgtgacgctg agcaatgttc gcgacgtgat cgccagcttg 720
gcgatcatgt tgttcgtatg cagggaccgg ccatcttctt ctttgccgct gctcatacgg 780
cccgtgctgg aaattagcag cggcgtcgac gatgttacct gcactgtttc cgaacctacg 840
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ggaaatccga tacagctgtg ggcctgcaag tccaacaccg atccgaatca gttgtggacg      960
atcagaaggg atggaacat tcgatcta atggaaggtgca tgacgacgta tggctattct      1020
gctggcgagt atgtaatgat ctacgactgt gatacagcgg agagggaggg gactctttgg      1080
cagatatggg gcaatggaac catcattaat cccagatcca atcttgtatt gggagctgcc      1140
tctggaagca gtggcactac gcttactgtg caaacgcagg catactcctt gggacagggg      1200
tggtttgcca gcaatgatac cgcacctcgc gaggtaacca tttatggctt tcgcgacctt      1260
tgcatggaag caaatgggga aagagtgtgg gtggagacct gtgcgagtag caaggagaac      1320
caaaaatggg cgttgtatgg ggatgggttct atacgcccga aaaaaacca agaccaatgc      1380
ctcacctgtc agaacgactc cgctaaaacc gtgatcaata ttgtgggctg cagcgctgga      1440
tcttcggggc agcgatggct atttaccaat gaagagacca ttttgaattt aaacagtggg      1500
ttggtcatgg atgtgacgca atccgatcca agccttcgcc aaataatcat ctttccagcc      1560
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<210> 2
<211> 532
<212> PRT
<213> Viscum ovalifolium

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<220>
<221> A-CHAIN
<222> (1)..(254)

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<220>
<221> B-CHAIN
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<400> 2

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Tyr Glu Arg Leu Arg Leu Arg Val Thr Pro Gln Thr Thr Gly Asp Glu
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Tyr Phe Arg Leu Ile Thr Leu Leu Arg Asp Tyr Val Ser Ser Gly Ser
20          25          30

```

```

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

```

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Asp Ala Gln Arg Phe Val Trp Val Glu Leu Ser Thr Gln Gly Gly Asp
50          55          60

```

```

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

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Glu Ala Gly Asp Gln Ser Tyr Phe Phe Arg Asp Ala Pro Asp Gly Ala
85          90          95

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Glu Gln His Leu Phe Thr Gly Thr Thr Arg Tyr Ser Leu Pro Phe Thr
100         105         110

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Gly Ser Tyr Thr Asp Leu Glu Arg Tyr Ala Gly Tyr Arg Asp Gln Ile
 115 120 125
 His Leu Gly Arg Glu Gln Leu Ile Gln Ala Val Gln Ala Leu Arg Tyr
 130 135 140
 Pro Gly Gly Ser Thr Arg Ala Gln Ala Arg Ser Leu Leu Val Val Ile
 145 150 155 160
 Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Phe Trp Arg Val
 165 170 175
 Arg Gln Asn Ile Asn Ser Gly Glu Ser Phe Leu Pro Asp Met Tyr Met
 180 185 190
 Leu Glu Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val Gln Gln
 195 200 205
 Ser Thr Asp Gly Val Phe Asn Thr Pro Ile Arg Leu Ala Leu Ser Thr
 210 215 220
 Gly Asn Tyr Val Thr Leu Ser Asn Val Arg Asp Val Ile Ala Ser Leu
 225 230 235 240
 Ala Ile Met Leu Phe Val Cys Arg Asp Arg Pro Ser Ser Ser Leu Pro
 245 250 255
 Leu Leu Ile Arg Pro Val Leu Glu Ile Ser Ser Gly Val Asp Asp Val
 260 265 270
 Thr Cys Thr Val Ser Glu Pro Thr Val Arg Ile Val Gly Arg Asn Gly
 275 280 285
 Leu Cys Val Asp Val Arg Asp Asp Ala Phe His Asn Gly Asn Pro Ile
 290 295 300
 Gln Leu Trp Ala Cys Lys Ser Asn Thr Asp Pro Asn Gln Leu Trp Thr
 305 310 315 320
 Ile Arg Arg Asp Gly Thr Ile Arg Ser Asn Gly Arg Cys Met Thr Thr
 325 330 335
 Tyr Gly Tyr Ser Ala Gly Glu Tyr Val Met Ile Tyr Asp Cys Asp Thr
 340 345 350
 Ala Glu Arg Glu Ala Thr Leu Trp Gln Ile Trp Gly Asn Gly Thr Ile
 355 360 365
 Ile Asn Pro Arg Ser Asn Leu Val Leu Gly Ala Ala Ser Gly Ser Ser
 370 375 380

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Gly Thr Thr Leu Thr Val Gln Thr Gln Ala Tyr Ser Leu Gly Gln Gly
385 390 395 400

Trp Leu Ala Ser Asn Asp Thr Ala Pro Arg Glu Val Thr Ile Tyr Gly
405 410 415

Phe Arg Asp Leu Cys Met Glu Ala Asn Gly Glu Arg Val Trp Val Glu
420 425 430

Thr Cys Ala Ser Ser Lys Glu Asn Gln Lys Trp Ala Leu Tyr Gly Asp
435 440 445

Gly Ser Ile Arg Pro Lys Gln Asn Gln Asp Gln Cys Leu Thr Cys Gln
450 455 460

Asn Asp Ser Ala Lys Thr Val Ile Asn Ile Val Gly Cys Ser Ala Gly
465 470 475 480

Ser Ser Gly Gln Arg Trp Leu Phe Thr Asn Glu Glu Thr Ile Leu Asn
485 490 495

Leu Asn Ser Gly Leu Val Met Asp Val Thr Gln Ser Asp Pro Ser Leu
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Arg Gln Ile Ile Ile Phe Pro Ala Thr Gly Asn Ala Asn Gln Met Trp
515 520 525

Leu Pro Val Pro
530

<210> 3
<211> 1692
<212> DNA
<213> Viscum album coloratum

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gttacgcatac aaaccacggg cgaccaatat ttcaagttca tcacgcttct ccgagatcat 180
gtctcaagcg gaagcttgct caatcaaata ccactcttgc gtcagtctac tgtccccgctc 240
tcggattcgc agagatttgt gttggtggaa ctaccaatc aggggggaga ctcgatcacg 300
gcggccatcg acgttaccaa tctgtacgtg gtggcttacc aagcaggcaa ccaatcctac 360
tttttgcgcg acgcacctcg cggcgcggaa acgtatctct tcaccggcac caccgatcc 420
tctctcccat tcaacggaag ctaccctgat ctggagcgat acgccggaca tagggaccag 480
atccctctcg gtatagacca actcattcaa tccgtctcgg cccttcggtt tccgggcagc 540
aacactcgtg cccaagctcg ttcctttatt atcctcattc agatgatctc cgaggccgcc 600
agattcaatc ccattttatg gagggctcgc caatacatta gcagtggggg gtcatttctg 660

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ccagacacgt acattctcca gctggagacg agttgggggc aacaatccac gcaagtccag      720
cactcgacgg atggcgTTTT taataacca attcggttga ctatatccac tgggtgtctt      780
gtgacgttga gcaatgttcg cgacgtgac gccagcttag cgatcatgtt gtttgtatgc      840
gaggaccggc catcttcctc tgacctgcgc tattggccgc tggtcatacg gcccgtgatg      900
gcgggacgatg gtacctgcac tccttccgaa cctacggtgc agattgtggg tctaaatggc      960
ctgtgcgtcg acgtccgaaa tggaaaattc cacgatggaa atccgataca gttgtggccc     1020
tgcaagtcca acaccgatag gaatcagctg tggacgatca gaagggatgg aaccattcga     1080
tctaatagca agtgcttgac cacctatggc tatcgtgatg gcatgtatgt aatgatctac     1140
aactgtaata cggccgtgcg ggaggccact atttggcaaa tatgggaaaa tggaaaccatc     1200
gttaatccaa gatccagtct ggtactggga gcagcatctg gaagcagccg cactacgctt     1260
actgtgcaaa cacaggctta ctcgttggga cagggctggc ttgccagcaa tgataccgcc     1320
cctcgcgagg taaccatata cggtttccgt gacctttgca tggaagctaa tggatcaagt     1380
gtgtgggtgg agacttgtgt gagtaacaag cagaaccaa aatgggcttt gtacggggat     1440
ggttctatac gcccacaaaca aaaccgaaac caatgcctca cctgccagaa agactccgtt     1500
tcaaccgtaa tcaatattgt tagctgcagc gcaggatcgt ctgggcagcg atgggtgttt     1560
accaataaag ggaccatttt gaatttaaag aatgggttgg tcctggatgt ggcgcaatca     1620
aatccaagtc tccgccgaat aatcatctac ccagccaccg gaaagcctaa tcaaatgtgg     1680
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<210> 4
<211> 564
<212> PRT
<213> Viscum album coloratum

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<220>
<221> A-CHAIN
<222> (34)..(287)
<223> A-Chain

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<220>
<221> B-CHAIN
<222> (302)..(564)
<223> B-Chain

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<400> 4

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Met Asn Ala Val Met Asp Ser Arg Arg Ala Trp Val Ser Cys Phe Leu
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```

Met Leu Gly Leu Val Phe Gly Ala Thr Val Lys Ala Glu Tyr Lys Phe
          20          25          30

```

```

Ser Tyr Glu Arg Leu Lys Leu Arg Val Thr His Gln Thr Thr Gly Asp
          35          40          45

```

107369 seq_ST25.txt

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

Ser Leu Ser Asn Gln Ile Pro Leu Leu Arg Gln Ser Thr Val Pro Val
65 70 75 80

Ser Asp Ser Gln Arg Phe Val Leu Val Glu Leu Thr Asn Gln Gly Gly
85 90 95

Asp Ser Ile Thr Ala Ala Ile Asp Val Thr Asn Leu Tyr Val Val Ala
100 105 110

Tyr Gln Ala Gly Asn Gln Ser Tyr Phe Leu Arg Asp Ala Pro Arg Gly
115 120 125

Ala Glu Thr Tyr Leu Phe Thr Gly Thr Thr Arg Ser Ser Leu Pro Phe
130 135 140

Asn Gly Ser Tyr Pro Asp Leu Glu Arg Tyr Ala Gly His Arg Asp Gln
145 150 155 160

Ile Pro Leu Gly Ile Asp Gln Leu Ile Gln Ser Val Ser Ala Leu Arg
165 170 175

Phe Pro Gly Ser Asn Thr Arg Ala Gln Ala Arg Ser Phe Ile Ile Leu
180 185 190

Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp Arg
195 200 205

Ala Arg Gln Tyr Ile Ser Ser Gly Gly Ser Phe Leu Pro Asp Thr Tyr
210 215 220

Ile Leu Gln Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val Gln
225 230 235 240

His Ser Thr Asp Gly Val Phe Asn Asn Pro Ile Arg Leu Thr Ile Ser
245 250 255

Thr Gly Val Phe Val Thr Leu Ser Asn Val Arg Asp Val Ile Ala Ser
260 265 270

Leu Ala Ile Met Leu Phe Val Cys Glu Asp Arg Pro Ser Ser Ser Asp
275 280 285

Leu Arg Tyr Trp Pro Leu Val Ile Arg Pro Val Met Ala Asp Asp Gly
290 295 300

Thr Cys Thr Pro Ser Glu Pro Thr Val Gln Ile Val Gly Leu Asn Gly
305 310 315 320

107369 seq_ST25.txt

Leu Cys Val Asp Val Arg Asn Gly Lys Phe His Asp Gly Asn Pro Ile
 325 330 335

Gln Leu Trp Pro Cys Lys Ser Asn Thr Asp Arg Asn Gln Leu Trp Thr
 340 345 350

Ile Arg Arg Asp Gly Thr Ile Arg Ser Asn Ser Lys Cys Leu Thr Thr
 355 360 365

Tyr Gly Tyr Arg Asp Gly Met Tyr Val Met Ile Tyr Asn Cys Asn Thr
 370 375 380

Ala Val Arg Glu Ala Thr Ile Trp Gln Ile Trp Glu Asn Gly Thr Ile
 385 390 395 400

Val Asn Pro Arg Ser Ser Leu Val Leu Gly Ala Ala Ser Gly Ser Ser
 405 410 415

Arg Thr Thr Leu Thr Val Gln Thr Gln Ala Tyr Ser Leu Gly Gln Gly
 420 425 430

Trp Leu Ala Ser Asn Asp Thr Ala Pro Arg Glu Val Thr Ile Tyr Gly
 435 440 445

Phe Arg Asp Leu Cys Met Glu Ala Asn Gly Ser Ser Val Trp Val Glu
 450 455 460

Thr Cys Val Ser Asn Lys Gln Asn Gln Lys Trp Ala Leu Tyr Gly Asp
 465 470 475 480

Gly Ser Ile Arg Pro Lys Gln Asn Arg Asn Gln Cys Leu Thr Cys Gln
 485 490 495

Lys Asp Ser Val Ser Thr Val Ile Asn Ile Val Ser Cys Ser Ala Gly
 500 505 510

Ser Ser Gly Gln Arg Trp Val Phe Thr Asn Lys Gly Thr Ile Leu Asn
 515 520 525

Leu Lys Asn Gly Leu Val Leu Asp Val Ala Gln Ser Asn Pro Ser Leu
 530 535 540

Arg Arg Ile Ile Ile Tyr Pro Ala Thr Gly Lys Pro Asn Gln Met Trp
 545 550 555 560

Leu Pro Leu Pro