

Orientation of BLyS and rGel

Orientation “A” (BLyS/rGel)



Orientation “B” (rGel/BLyS)



FIG. 1

DNA and Protein Sequence of BLyS/rGel Fusion Toxin (Orientation "A")

DNA Sequence: SEQ ID NO:9
 GCC GTT CAG GGT CCA GAA GAA ACA GTC ACT CAA GAC TGC TTG CAA CTG ATT GCA GAC AGT GAA ACA CCA ACT ATA CAA AAA
 GGA TCT TAC ACA TTT GTT CCA TGG CTT CTC AGC TTT AAA AGG GGA AGT GCC CTA GAA AAA GAG AAT AAA ATA TTG GTC
 AAA GAA ACT GGT TAC TTT TTT AIA TAT GGT CAG GTT TTA TAT ACT GAT AAG ACC TAC GCC ATG GGA CAT CTA ATT CAG AGG
 AAG AAG GTC CAT GTC TTT GGG GAT GAA TTG AGT CTG GTC ACT TTG TTT CGA TGT ATT CAA AAT ATG CCT GAA ACA CTA CCC
 AAT AAT TCC TGC TAT TCA GCT GGC ATT GCA AAA CTG GAA GAA GGA GAT GAA CTC CAA CTT GCA ATA CCA AGA GAA AAT GCA
 CAA ATA TCA CTG GAT GGA GAT GTC ACA TTT TTT GGT GCA TTG AAA CTG GGG GGA GGC GGG AGC GGC CTG GAC ACC GTG
 AGC TTT AGC ACT AAA GGT GCC ACT TAT ATT ACC TAC GTG AAT TTC TTG AAT GAG CTA CGA GTT AAA TTG AAA CCC GAA GGT
 AAC AGC CAT GGA ATC CCA TTG CTG CGC AAA AAA TGT GAT GAT CCI GGA AAG TGT TTC GTT TTG GTA GCG CTT TCA AAT GAC
 AAT GGA CAG TTG GCG GAA ATA OCT ATA GAT GTT ACA AGT GTT TAT GTG GTG GGC TAT CAA GTA AGA AAC AGA TCT TAC TTC
 TTT AAA GAT GCT CCA GAT GCT TAC GAA GGC CTC TTC AAA AAC ACA ATT AAA ACA AGA CTT CAT TTT GGC GGC AGC TAT
 CCC TCG CTG GAA GGT GAG AAG GCA TAT AGA GAG ACA ACA CTG GGC ATT GAA CCA TTA AGG ATT GGC ATC AAG AAA CTT
 GAT GAA AAT GCG ATA GAC AAT TAT AAA CCA ACG GAG ATA GCT AGT TCT CTA TTG GTT GTT ATT CAA ATG GTG TCT GAA GCA
 GCT CGA TTC ACC TTT ATT GAG AAC CAA ATT AGA AAT AAC TTT CAA CAG AGA ATT CGC CCG GCG AAT AAT ACA ATC AGC CTT
 GAG AAT AAA TGG GGT AAA CTC TCG TTC CAG ATC CGG ACA TCA GGT GCA AAT GGA ATG TTT TCG GAG GCA GTT GAA TTG GAA
 CGT GCA AAT GGC AAA AAA TAC TAT GTC ACC GCA GTT GAT CAA GTA AAA CCC AAA AIA GCA CTC TTG AAG TTC GTC GAT AAA
 GAT CCT AAA

Protein Sequence: SEQ ID NO:3
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 FKDAPDAAYEGLFKNTIKTRLHFHFGGSYPSLEGEKAYRETTDLGIEPLRIGIKKIDENAIIDNYKPTFIASSLLVVIQMVSEA
 ARFTFIENQIRNNFQQRIRPANNTISLENKWKLSFQIRTSANGMFMSEAVELERANGKKYYVTAVDQVKPKIALLKFFVDKDPK

FIG. 2

DNA and Protein Sequence of rGel/BLyS Fusion Toxin (Orientation "B")

Gene Sequence SEQ ID NO:11
GGC CTG GAC ACC GTG AGC TTT AGC ACT AAA GGT GCC ACT TAT ATT ACC TAC GTG AAT TTC TTG AAT GAG CTA CGA GTT AAA
TTG AAA CCC GAA GGT AAC AGC CAT GGA ATC CCA TTG CTG CGC AAA AAA TGT GAT GAT CCT GGA AAG TGT TTC GTT TTG GTA
GCG CTT TCA AAT GAC AAT GGA CAG TTG GCG GAA ATA GCT ATA GAT GTT ACA AGT GTT TAT GTG GTG GGC TAT CAA GTA AGA
AAC AGA TCT TAC TTC TTT AAA GAT GCT CCA GAT GCT TAC TAC GAA GGC CTC TTC AAA AAC ACA AAT AAA ACA AGA CTT CAT
TTT GGC GGC AGC TAT CCC TCG CTG GAA GGT GAG AAG GCA TAT AGA GAG ACA ACA GAC TTG GGC ATT GAA CCA TTA AGG ATT
GGC ATC AAG AAA CTT GAT GAA AAT GCG ATA GAC AAT TAT AAA CCA CCG GAG ATA GCT AGT TCT CTA TTG GTT GTT AIT CAA
ATG GTG TCT GAA GCA GCT CGA TTC ACC TTT ATT GAG AAC CAA ATT AGA AAT AAC TTT CAA CAG AGA ATT CGC CCG GCG AAT
AAT ACA ATC AGC CTT GAG AAT AAA TGG GGT AAA CTC TCG TTC CAG ATC CGG ACA TCA GGT GCA AAT GGA ATG TTT TCG GAG
GCA GTT GAA TTG GAA CGT GCA AAT GGC AAA AAA TAC TAT GTC ACC GCA GTT GAT CAA GTA AAA CCC AAA ATA GCA CTC TTG
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ACT GAT AAG ACC TAC GCC ATG GGA CAT CTA ATT CAG AGG AAG AGG GTC CAT GTC TTT GGG GAT GAA TTG AGT CTG GTG ACT
TTG TTT CGA TGT ATT CAA AAT ATG CCT GAA ACA CTA CCC AAT AAT TCC TGC TAT TCA GCT GGC ATT GCA AAA CTG GAA GAA
GGA GAT GAA CTC CAA CTT GCA ATA CCA AGA GAA AAT GCA CAA ATA TCA CTG GAT GGA GAT GTC ACA TTT TTT GGT GCA TTG
AAA CTG CTG

Protein Sequence SEQ ID NO:10
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FIG. 3

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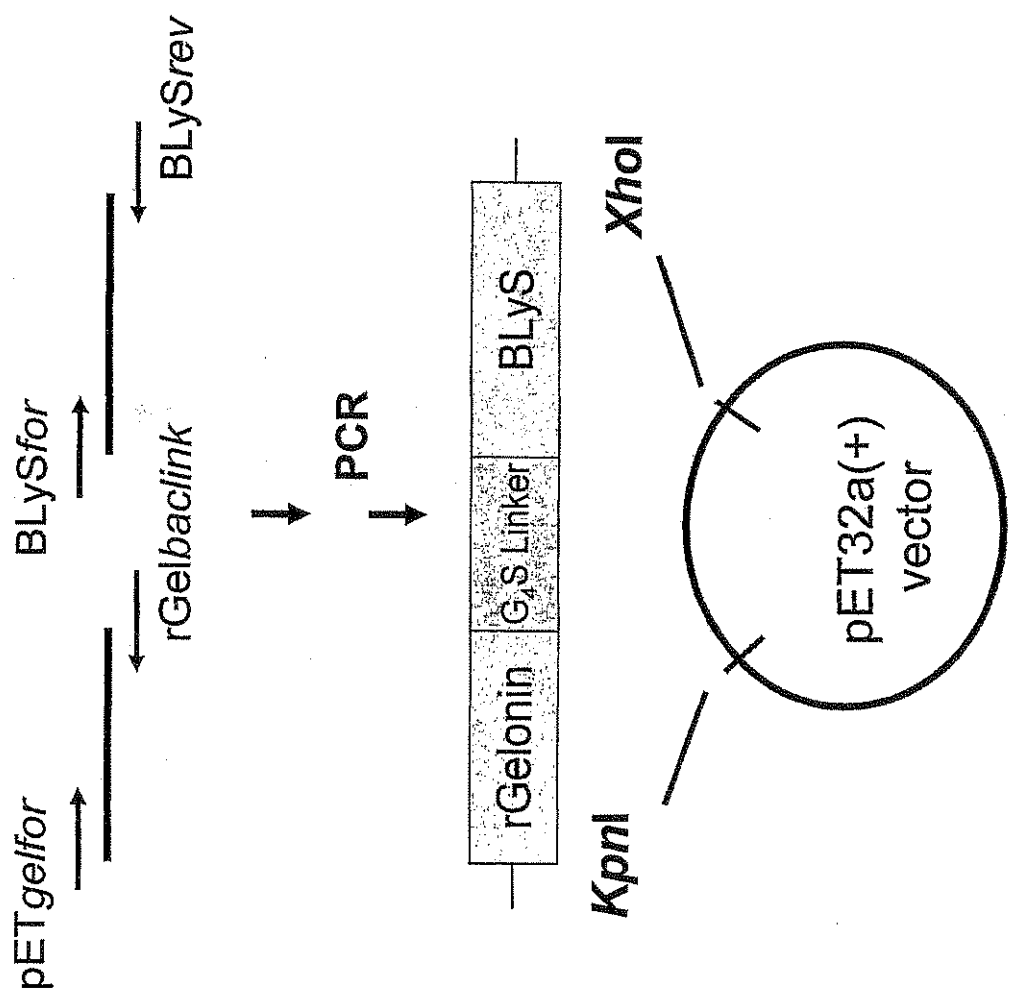


FIG. 4

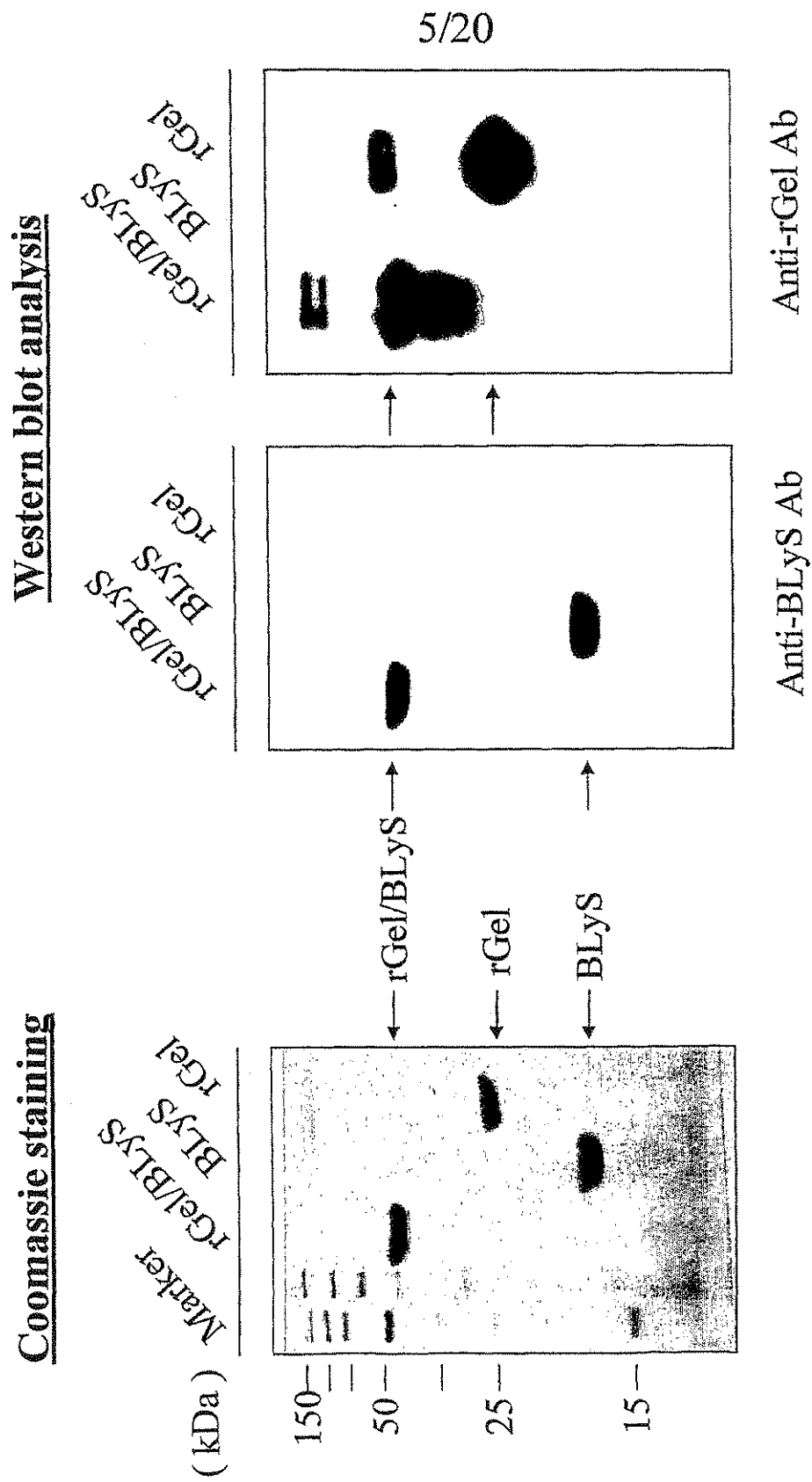


FIG. 5

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Cell-free protein synthesis inhibitory activity of rGel/BLyS vs rGel

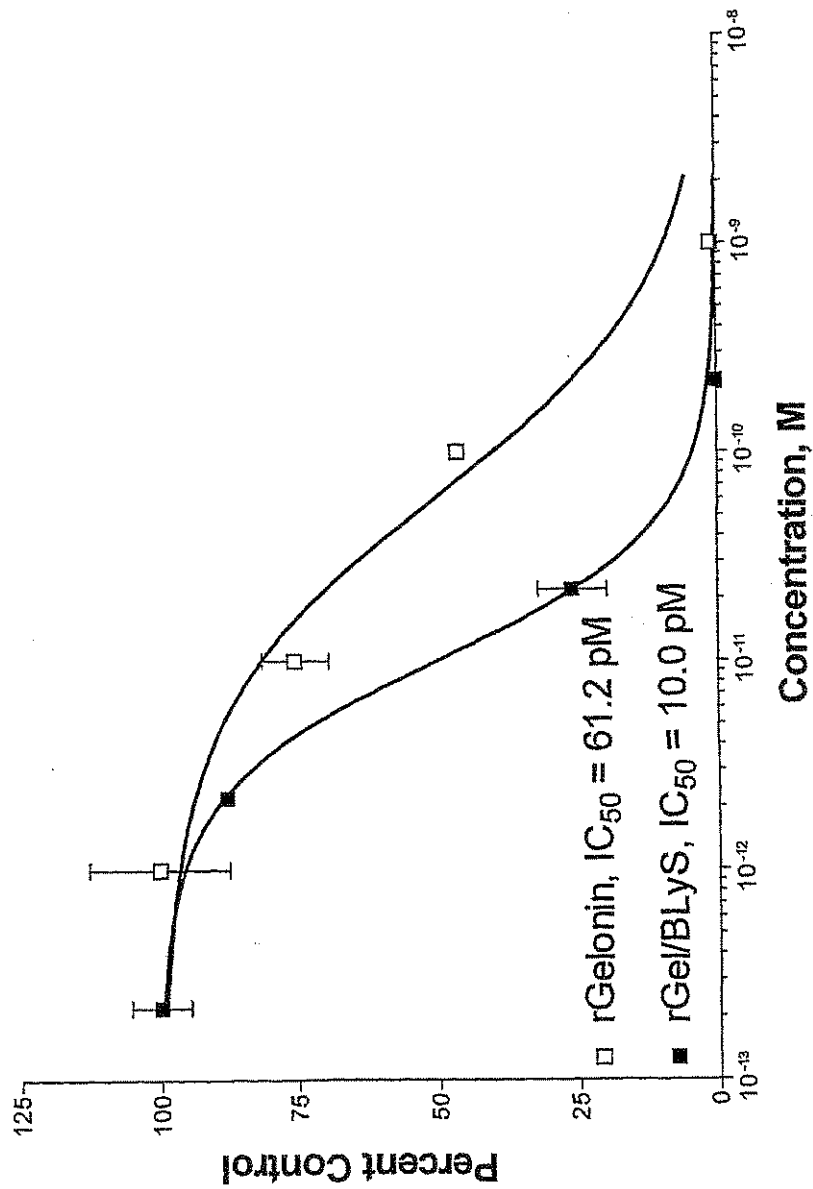


FIG. 6

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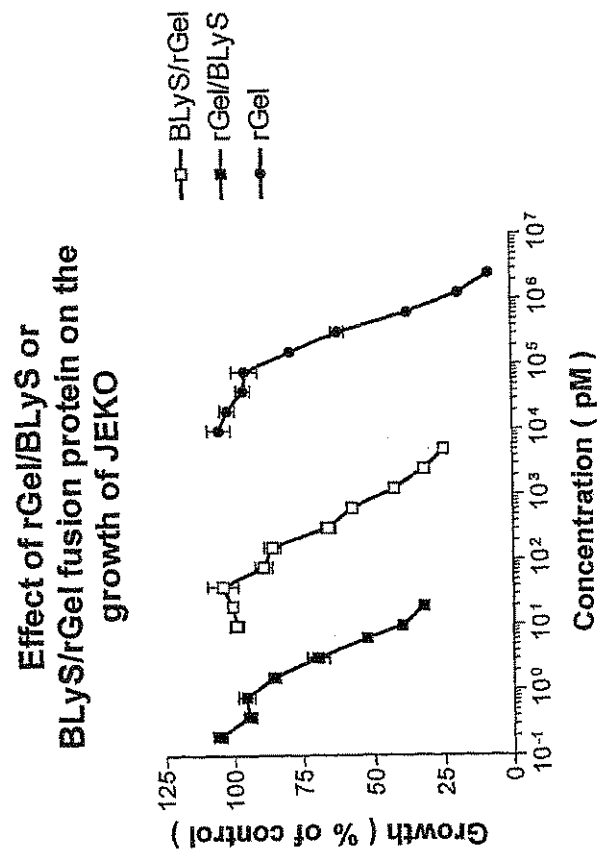


FIG. 7

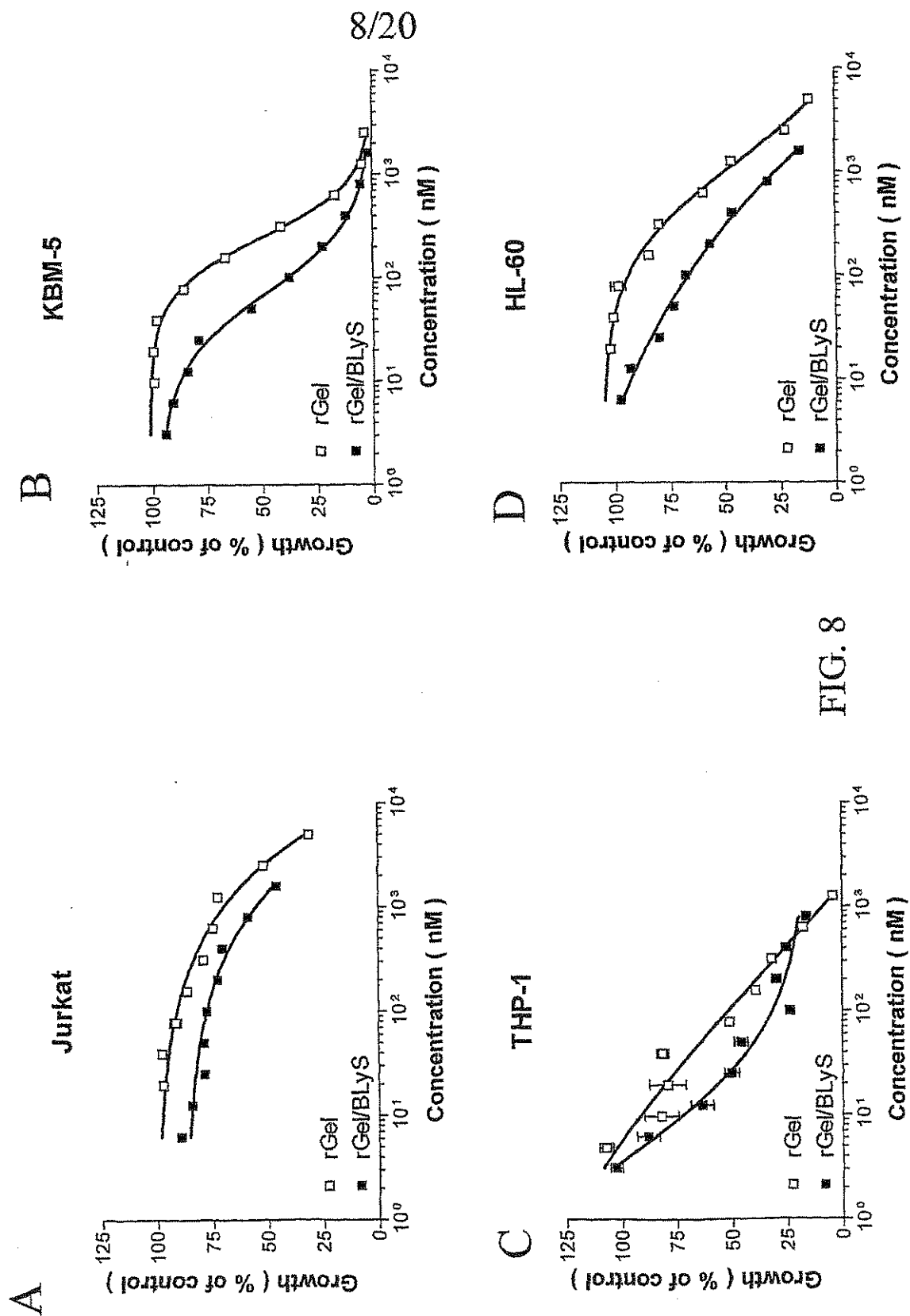


FIG. 8

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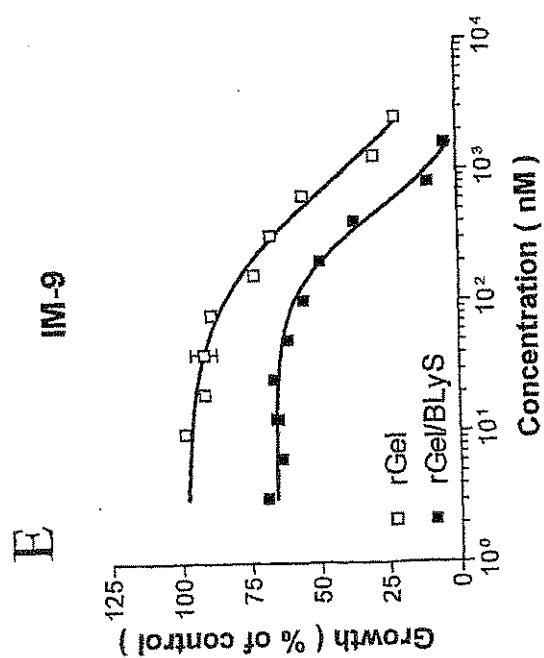


FIG. 8

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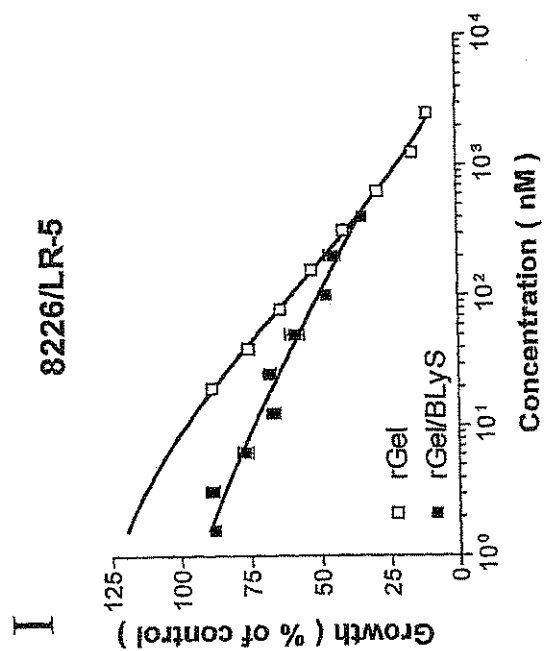
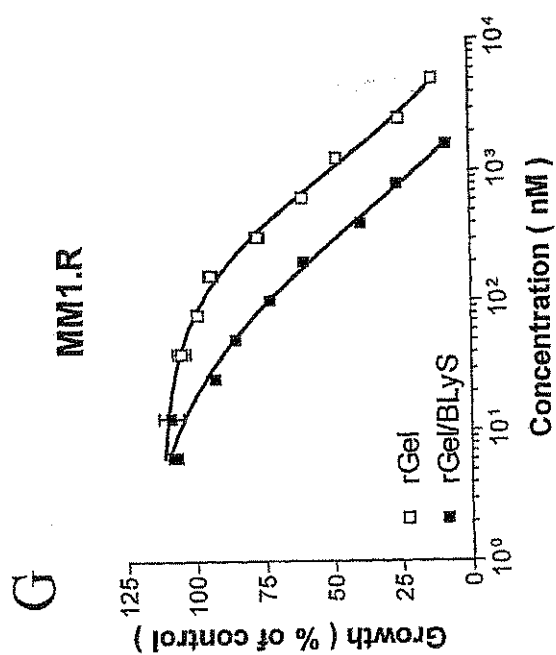
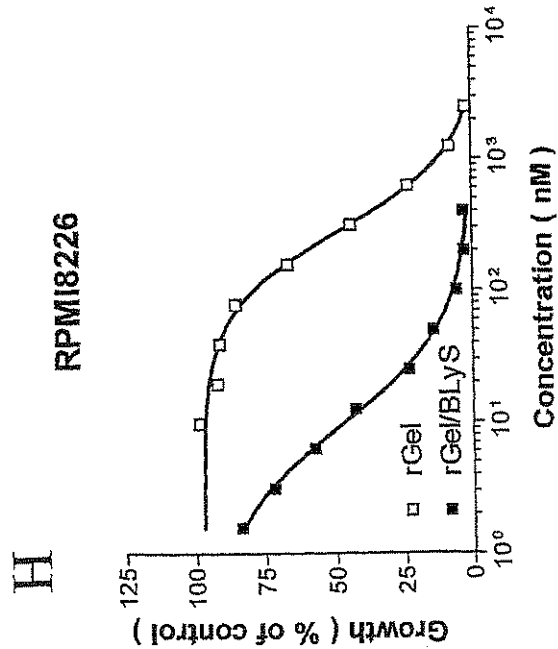
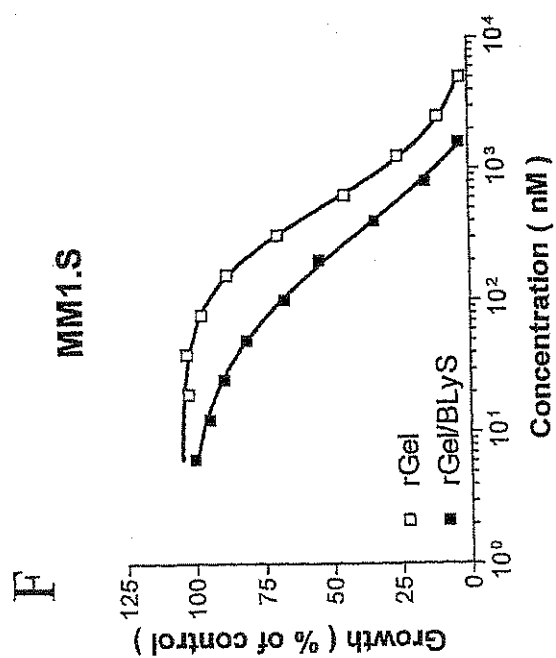


FIG. 8



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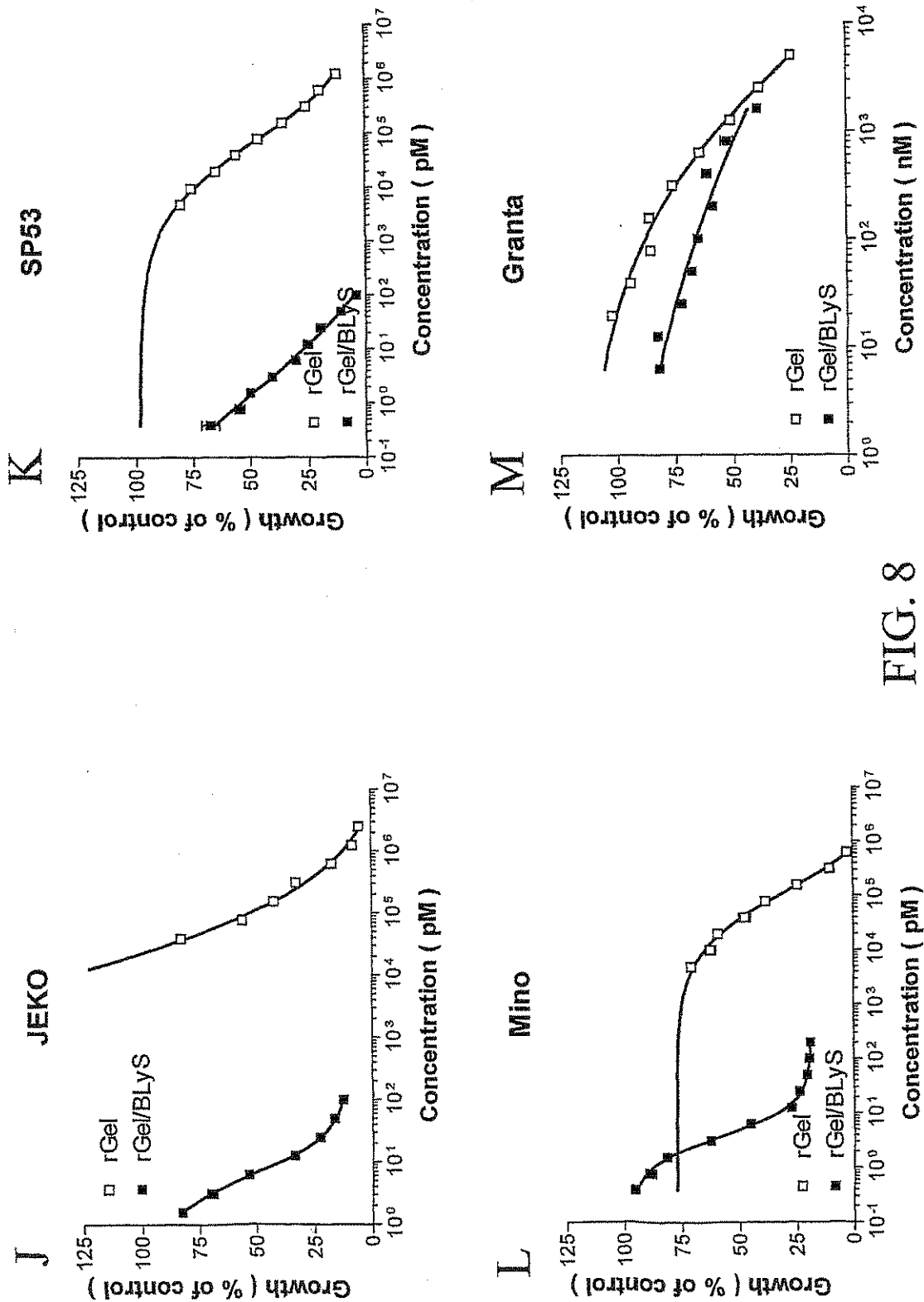


FIG. 8

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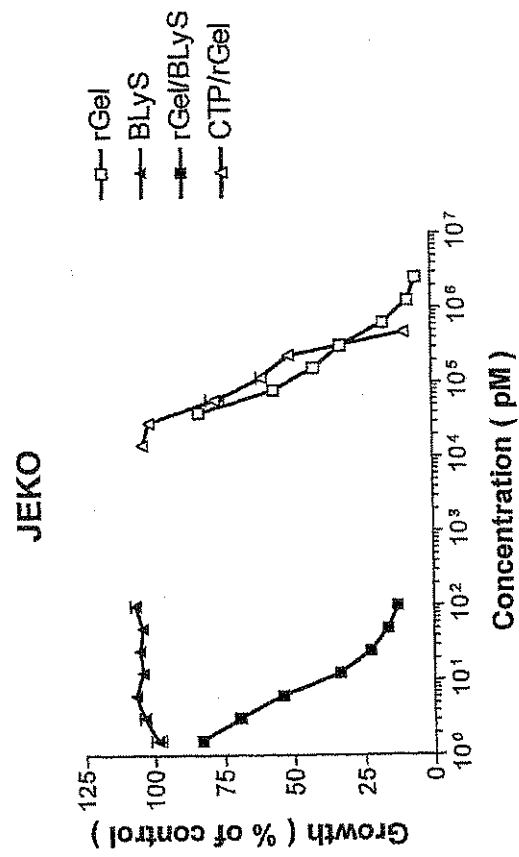


FIG. 9

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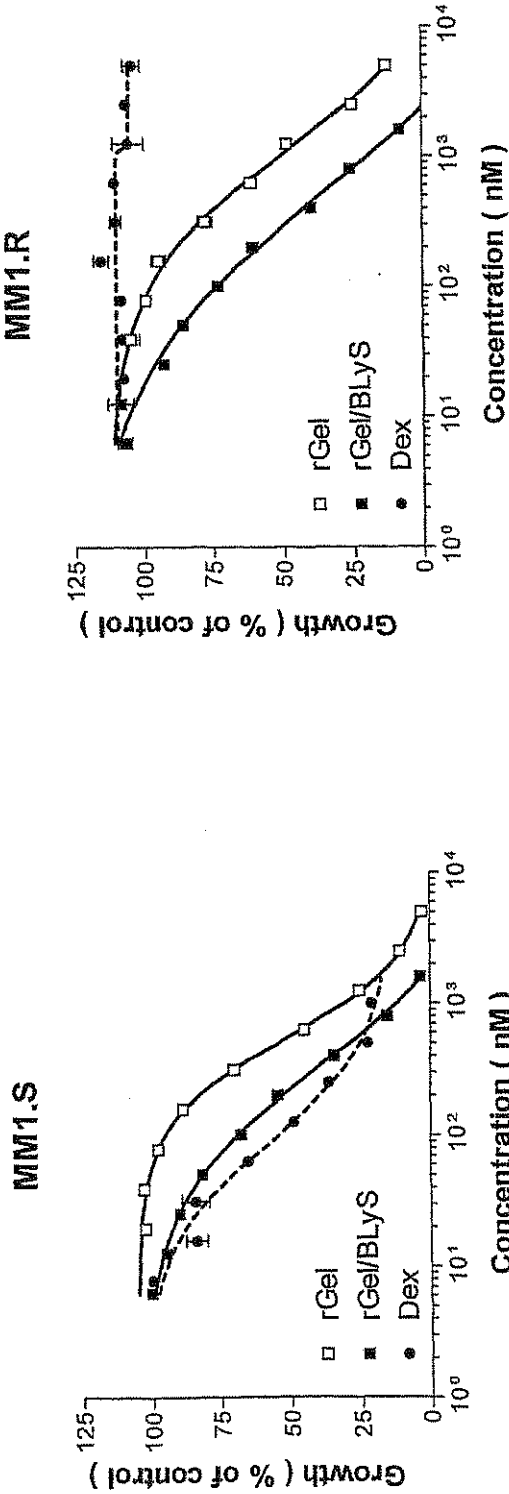
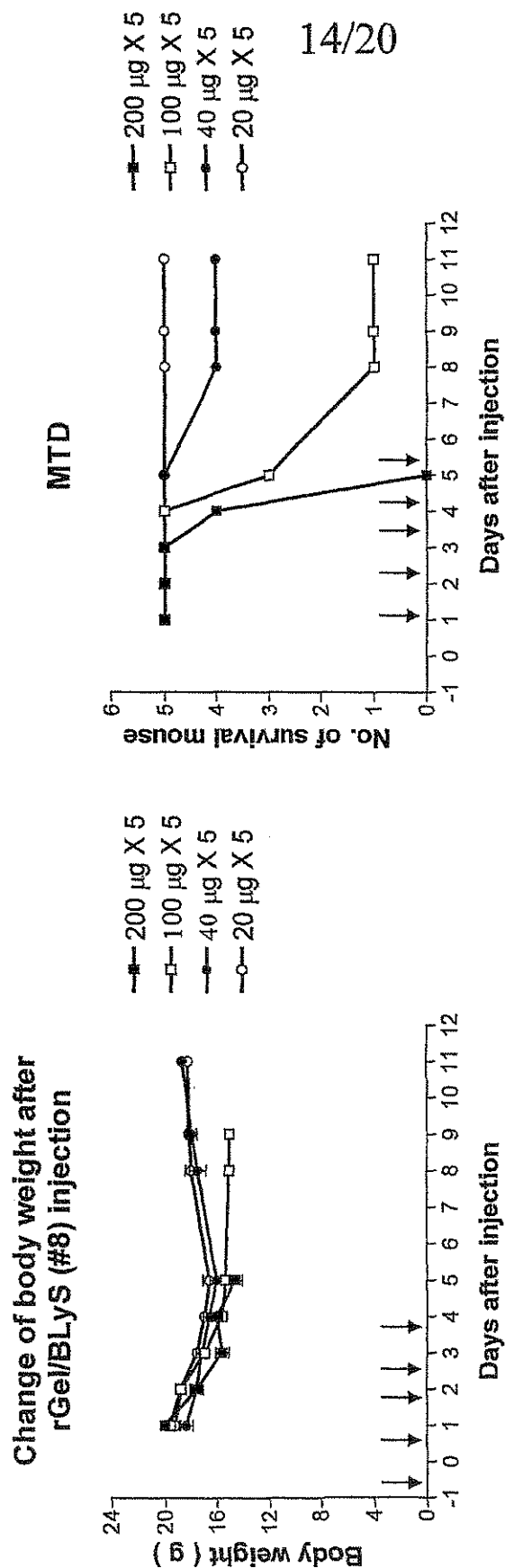


FIG. 10



* Endotoxin (QCL-1000): 15.3 EU/ml (7.65 EU/mg)

FIG. 11

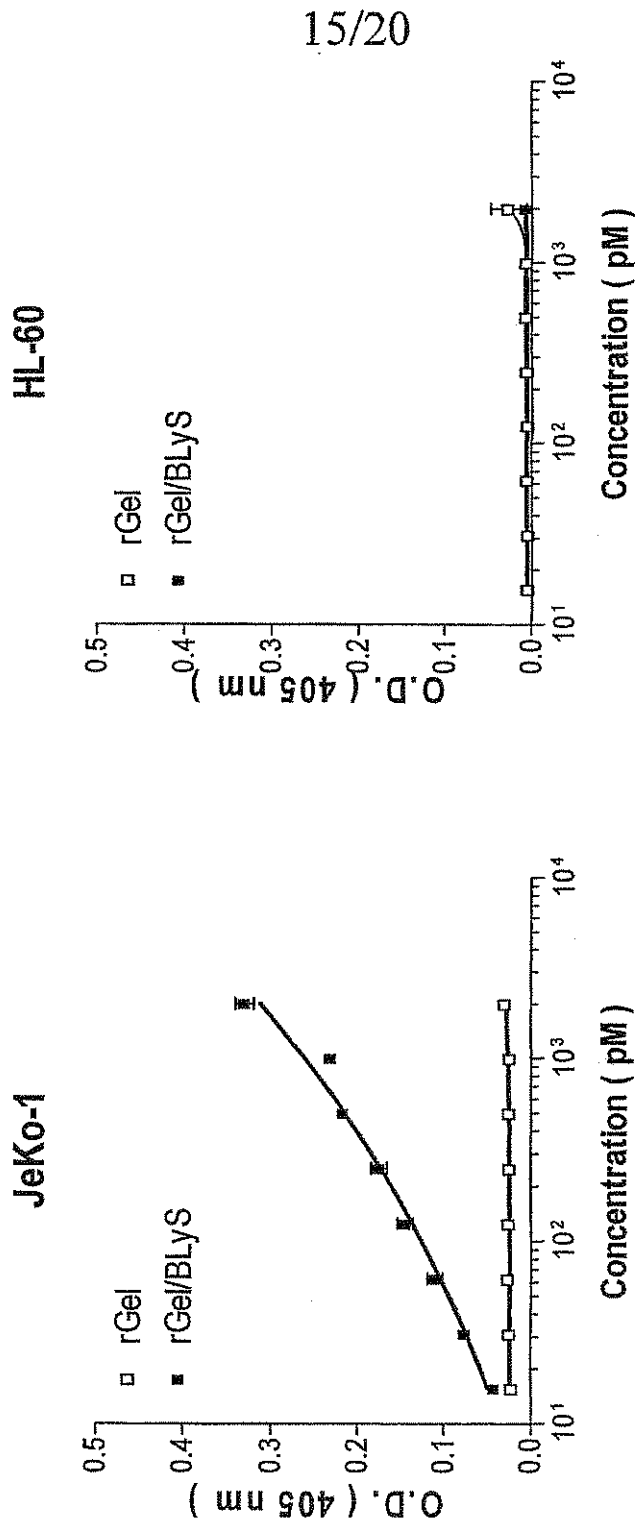


FIG. 12

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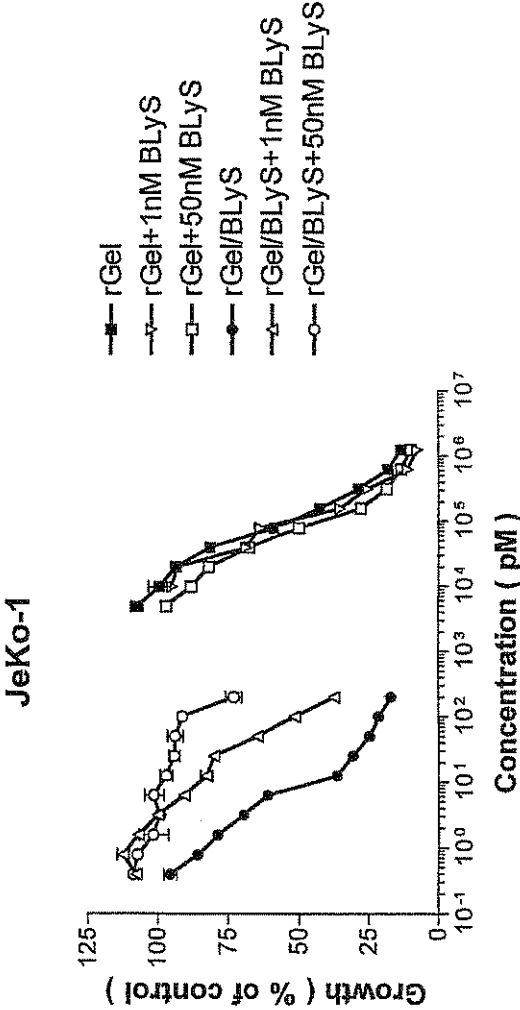


FIG. 13A

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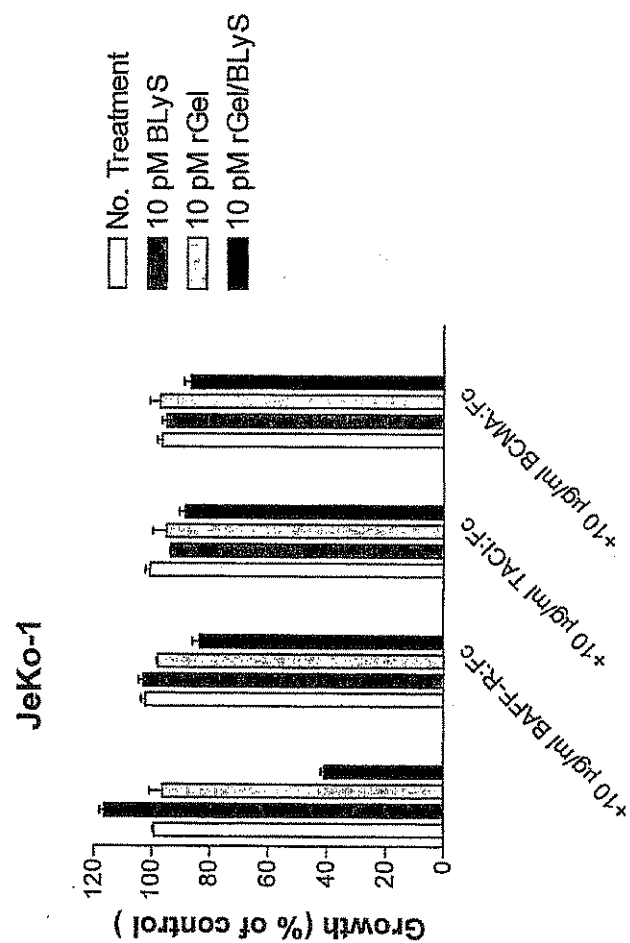


FIG. 13B

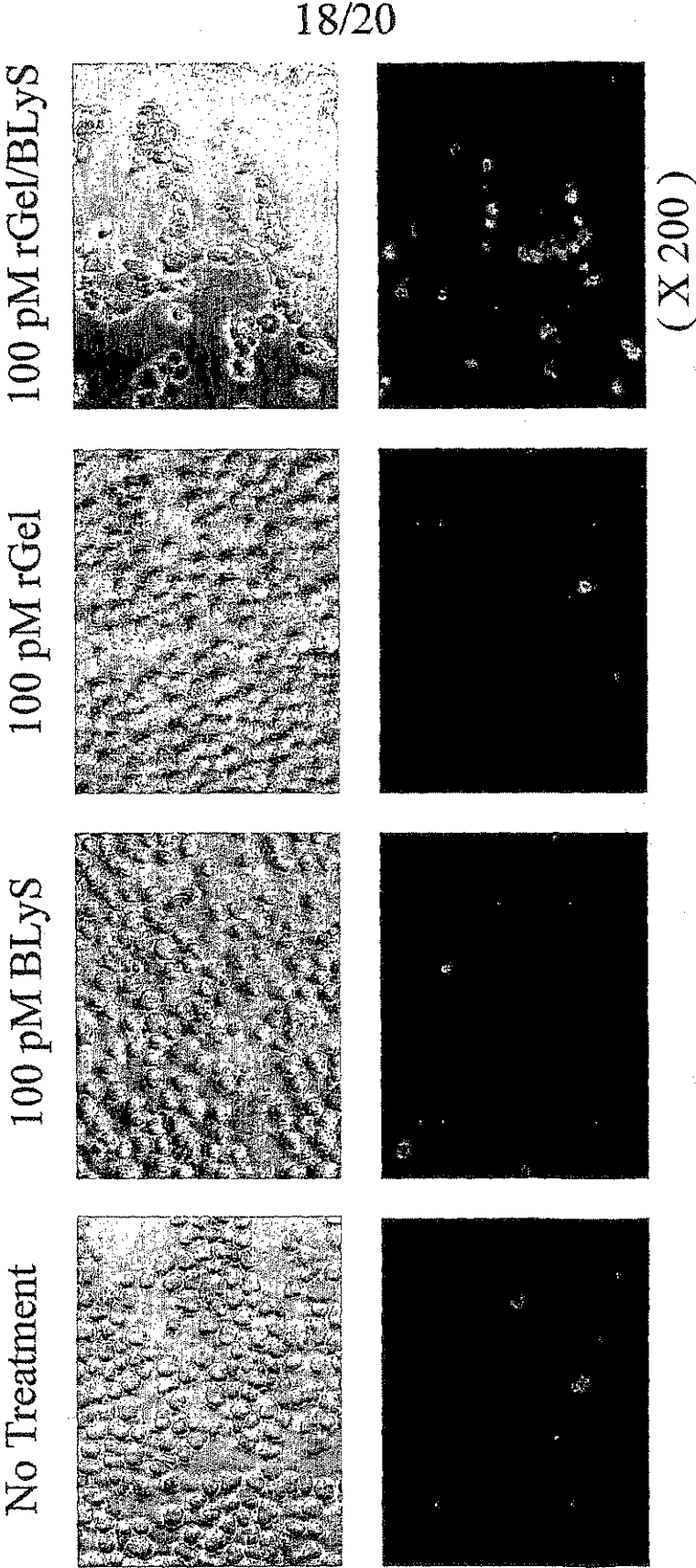


FIG. 14A

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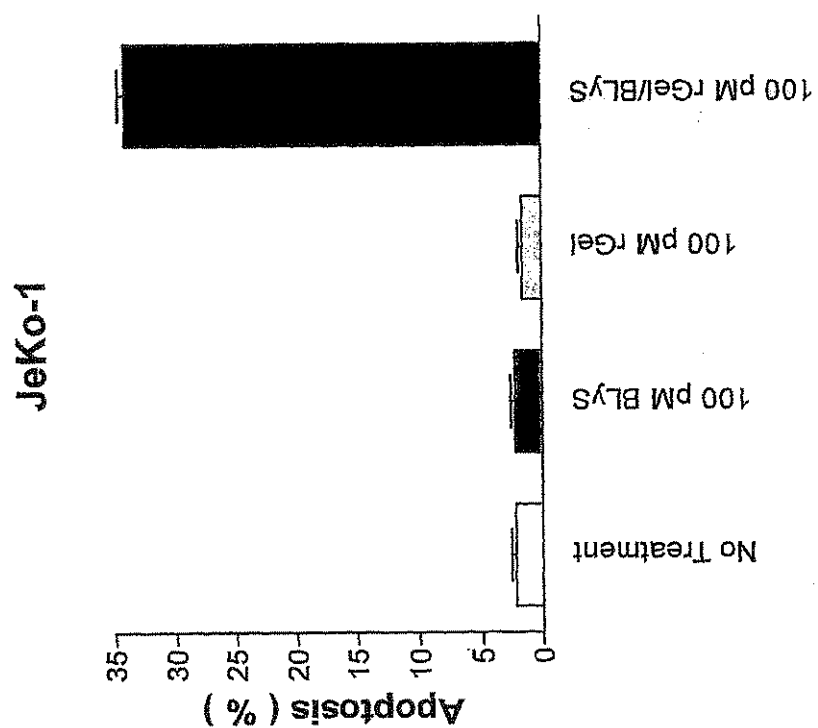


FIG. 14B

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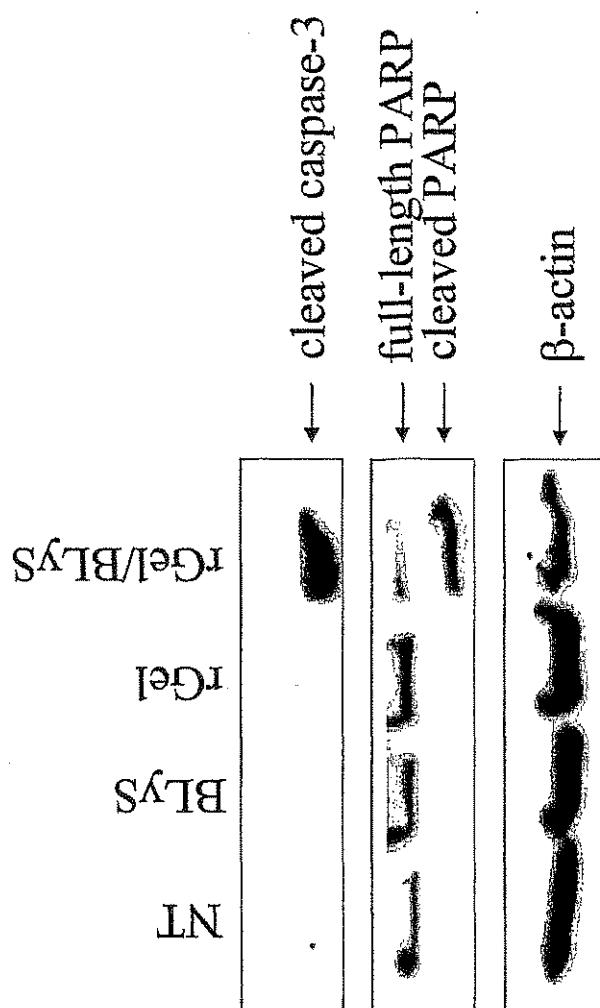


FIG. 14C

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 Lyu, Mi-Ae

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 35 40 45

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Lys Ile Phe Glu Pro Pro Ala Pro Gly Glu Gly Asn Ser Ser Gln Asn
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Gln Gly Pro Glu Glu Thr Glu Gln Asp Val Asp Leu Ser Ala Pro Pro
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Leu Gly Met Ala Asn Ile Asp Leu Glu Lys Ser Arg Thr Gly Asp Glu
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Glu Asp Cys Ile Lys Ser Lys Pro Lys Val Asp Ser Asp His Cys Phe
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Pro Leu Pro Ala Met Glu Glu Gly Ala Thr Ile Leu Val Thr Thr Lys
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Ser Ser Pro Ala Pro Arg Thr Ala Leu Gln Pro Gln Glu Ser Val Gly
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 Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
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 35 40 45

Glu Asn Lys Ile Leu Val Lys Glu Thr Gly Tyr Phe Phe Ile Tyr Gly
 50 55 60

Gln Val Leu Tyr Thr Asp Lys Thr Tyr Ala Met Gly His Leu Ile Gln
 65 70 75 80

Arg Lys Lys Val His Val Phe Gly Asp Glu Leu Ser Leu Val Thr Leu
 85 90 95

Phe Arg Cys Ile Gln Asn Met Pro Glu Thr Leu Pro Asn Asn Ser Cys
 100 105 110

Tyr Ser Ala Gly Ile Ala Lys Leu Glu Glu Gly Asp Glu Leu Gln Leu
 115 120 125

Ala Ile Pro Arg Glu Asn Ala Gln Ile Ser Leu Asp Gly Asp Val Thr
 130 135 140

Phe Phe Gly Ala Leu Lys Leu Leu Gly Gly Gly Gly Ser Gly Leu Asp
 145 150 155 160

Thr Val Ser Phe Ser Thr Lys Gly Ala Thr Tyr Ile Thr Tyr Val Asn
 165 170 175

Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly Asn Ser His
 180 185 190

Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly Lys Cys Phe
 195 200 205

Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala Glu Ile Ala
 210 215 220

Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val Arg Asn Arg
 225 230 235 240

Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu Gly Leu Phe
 245 250 255

Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser Tyr Pro Ser
 260 265 270

Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu Gly Ile Glu
 275 280 285

Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala Ile Asp Asn
 290 295 300

Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val Ile Gln Met
 305 310 315 320

Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln Ile Arg Asn
 325 330 335

Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile Ser Leu Glu
340 345 350

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

Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn Gly Lys Lys
370 375 380

Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile Ala Leu Leu
385 390 395 400

Lys Phe Val Asp Lys Asp Pro Lys
405

<210> 9
<211> 1224
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> Polynucleotide encoding the conjugated polypeptide

<400> 9
gccgttcagg gtccagaaga aacagtcact caagactgct tgcaactgat tgcagacagt 60
gaaacaccaa ctatacaaaa aggatcttac acatttggtc catggcttct cagctttaa 120
aggggaagtg ccctagaaga aaaagagaat aaaatattgg tcaaagaaac tggttacttt 180
tttatatatg gtcaggtttt atatactgat aagacctacg ccatgggaca tctaattcag 240
aggaagaagg tccatgtctt tggggatgaa ttgagtctgg tgactttggt tcgatgtatt 300
caaaatatgc ctgaaacact acccaataat tcctgctatt cagctggcat tgcaaaactg 360
gaagaaggag atgaactcca acttgcaata ccaagagaaa atgcacaaat atcactggat 420
ggagatgtca catttttttg tgcattgaaa ctgctggggg gaggcgggag cggcctggac 480
accgtgagct ttagcactaa aggtgccact tatattacct acgtgaattt cttgaatgag 540
ctacgagtta aattgaaacc cgaaggtaac agccatggaa tcccattgct gcgcaaaaaa 600
tgtgatgato ctggaaagtg ttctgttttg gtagcgcttt caaatgacaa tggacagtgtg 660
gcggaaatag ctatagatgt tacaagtgtt tatgtggtgg gctatcaagt aagaaacaga 720
tcttacttct ttaaagatgc tcagatgct gcttacgaag gcctcttcaa aaacacaatt 780
aaaacaagac ttcatttttg cggcagctat ccctcgctgg aaggtgagaa ggcatataga 840
gagacaacag acttgggcat tgaaccatta aggattggca tcaagaaact tgatgaaaat 900
gcgatagaca attataaacc aacggagata gctagttctc tattggttgt tattcaaatg 960

gtgtctgaag cagctcgatt cacctttatt gagaacccaaa ttagaaataa ctttcaacag 1020
 agaattcgcc cggcgaataa tacaatcagc cttgagaata aatggggtaa actctcgttc 1080
 cagatccgga catcaggtgc aaatggaatg ttttcggagg cagttgaatt ggaacgtgca 1140
 aatggcaaaa aatactatgt caccgcagtt gatcaagtaa aaccctaaaat agcactcttg 1200
 aagttcgtcg ataaagatcc taaa 1224

<210> 10
 <211> 408
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> Conjugated Polypeptide

<400> 10

Gly Leu Asp Thr Val Ser Phe Ser Thr Lys Gly Ala Thr Tyr Ile Thr
 1 5 10 15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
 20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly
 35 40 45

Lys Cys Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
 50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
 65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
 85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
 100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
 115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
 130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
 145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
 165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
 180 185 190

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

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
 210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
 225 230 235 240

Ala Leu Leu Lys Phe Val Asp Lys Asp Pro Lys Gly Gly Gly Gly Ser
 245 250 255

Ala Val Gln Gly Pro Glu Glu Thr Val Thr Gln Asp Cys Leu Gln Leu
 260 265 270

Ile Ala Asp Ser Glu Thr Pro Thr Ile Gln Lys Gly Ser Tyr Thr Phe
 275 280 285

Val Pro Trp Leu Leu Ser Phe Lys Arg Gly Ser Ala Leu Glu Glu Lys
 290 295 300

Glu Asn Lys Ile Leu Val Lys Glu Thr Gly Tyr Phe Phe Ile Tyr Gly
 305 310 315 320

Gln Val Leu Tyr Thr Asp Lys Thr Tyr Ala Met Gly His Leu Ile Gln
 325 330 335

Arg Lys Lys Val His Val Phe Gly Asp Glu Leu Ser Leu Val Thr Leu
 340 345 350

Phe Arg Cys Ile Gln Asn Met Pro Glu Thr Leu Pro Asn Asn Ser Cys
 355 360 365

Tyr Ser Ala Gly Ile Ala Lys Leu Glu Glu Gly Asp Glu Leu Gln Leu
 370 375 380

Ala Ile Pro Arg Glu Asn Ala Gln Ile Ser Leu Asp Gly Asp Val Thr
 385 390 395 400

Phe Phe Gly Ala Leu Lys Leu Leu
405

<210> 11
<211> 1224
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> Polynucleotide encoding the conjugated polypeptide

<400> 11
ggcctggaca ccgtgagctt tagcactaaa ggtgccactt atattaccta cgtgaatttc 60
ttgaatgagc tacgagttaa attgaaaccc gaaggtaaca gccatggaat cccattgctg 120
cgcaaaaaat gtgatgatcc tggaaagtgt ttcgtttttg tagcgctttc aaatgacaat 180
ggacagttagg cggaaatagc tatagatggt acaagtgttt atgtgggtggg ctatcaagta 240
agaaacagat cttacttctt taaagatgct ccagatgctg cttacgaagg cctcttcaaa 300
aacacaatta aaacaagact tcattttggc ggcagctatc cctcgctgga aggtgagaag 360
gcatatagag agacaacaga cttgggcatt gaaccattaa ggattggcat caagaaactt 420
gatgaaaatg cgatagacaa ttataaacca acggagatag ctagttctct attggttggt 480
attcaaattg tgtctgaagc agctcgatc acctttattg agaaccaaat tagaaataac 540
tttcaacaga gaattcgccc gggaataat acaatcagcc ttgagaataa atggggtaaa 600
ctctcgttcc agatccggac atcagggtgca aatggaatgt ttccggaggc agttgaattg 660
gaacgtgcaa atggcaaaaa atactatgtc accgcagttg atcaagtaaa acccaaaata 720
gcactcttga agttcgctga taaagatcct aaagggggag ggggagcgc cgttcagggt 780
ccagaagaaa cagtcactca agactgcttg caactgattg cagacagtga aacaccaact 840
atacaaaaag gatcttacac atttgttcca tggcttctca gctttaaaag gggaagtgcc 900
ctagaagaaa aagagaataa aatattggtc aaagaaactg gttacttttt tatatatggt 960
cagggttttat atactgataa gacctacgcc atgggacatc taattcagag gaagaaggtc 1020
catgtctttg gggatgaatt gagtctggtg actttgttcc gatgtattca aaatatgcct 1080
gaaacactac ccaataatcc ctgctattca gctggcattg caaaactgga agaaggagat 1140
gaactccaac ttgcaatacc aagagaaaat gcacaaatat cactggatgg agatgtcaca 1200
ttttttggtg cattgaaact gctg 1224

<210> 12
<211> 45
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> Primer

<400> 12
ggcgggaagcg gtaccgacga cgacgacaag gccgttcagg gtcca 45

<210> 13
<211> 30
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> Primer

<400> 13
gctcccgct cccccagca gtttcaatgc 30

<210> 14
<211> 30
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> Primer

<400> 14
gggggaggcg ggagcggcct ggacaccgtg 30

<210> 15
<211> 39
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> Primer

<400> 15
gctcgtgtcg acctcgagtc attatttagg atctttatc 39

<210> 16
<211> 51
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> Primer

<400> 16
agcccagatc tgggtaccga cgacgacgac aagggcctgg acaccgtgag c 51

<210> 17
<211> 27
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
 <223> Primer

 <400> 17
 gctcccgccct cccctttag gatcttt 27

 <210> 18
 <211> 30
 <212> DNA
 <213> ARTIFICIAL SEQUENCE

 <220>
 <223> Primer

 <400> 18
 gggggaggcg ggagcgccgt tcagggtcca 30

 <210> 19
 <211> 36
 <212> DNA
 <213> ARTIFICIAL SEQUENCE

 <220>
 <223> Primer

 <400> 19
 gccgtcgacc tcgagtcatt acagcagttt caatgc 36

 <210> 20
 <211> 1204
 <212> DNA
 <213> HUMAN

 <400> 20
 gaaattctta caaaaactga aagtgaatg aggaagacag attgagcaat ccaatcggag 60
 ggtaaatgcc agcaaaccta ctgtacagta ggggtagaga tgcagaaagg cagaaaggag 120
 aaaattcagg ataactctcc tgaggggtga gccaagccct gccatgtagt gcacgcagga 180
 catcaacaaa cacagataac aggaaatgat ccattccctg tggtcactta ttctaaaggc 240
 cccaaccttc aaagttcaag tagtgatatg gatgactcca cagaaaggga gcagtcacgc 300
 cttacttctt gocttaagaa aagagaagaa atgaaactga aggagtgtgt ttccatcctc 360
 ccacggaagg aaagcccctc tgtccgatcc tccaaagacg gaaagctgct ggctgcaacc 420
 ttgctgctgg cactgctgtc ttgctgcctc acgggtggtgt ctttctacca ggtggccgcc 480
 ctgcaagggg acctggccag cctccgggca gagctgcagg gccaccacgc ggagaagctg 540
 ccagcaggag caggagcccc caaggccggc ctggaggaag ctccagctgt caccgcggga 600
 ctgaaaatct ttgaaccacc agctccagga gaaggcaact ccagtcagaa cagcagaaat 660
 aagcgtgccg ttcagggtcc agaagaaaca gtcactcaag actgcttgca actgattgca 720

gacagtgaaa caccaactat acaaaaagga tcttacacat ttgttccatg gcttctcagc 780
 tttaaaaggg gaagtgcctt agaagaaaaa gagaataaaa tattgggtcaa agaaactggt 840
 tactttttta tatatgggtca ggtttttatat actgataaga cctacgccat gggacatcta 900
 attcagagga agaaggtcca tgtctttggg gatgaattga gtctgggtgac tttgtttcga 960
 tgtattcaaa atatgcctga aacactaccc aataattcct gctattcagc tggcattgca 1020
 aaactggaag aaggagatga actccaactt gcaataccaa gagaaaatgc acaaatatca 1080
 ctggatggag atgtcacatt ttttgggtgca ttgaaactgc tgtgacctac ttacaccatg 1140
 tctgtagcta ttttctctcc tttctctgta cctctaagaa gaaagaatct aactgaaaat 1200
 acca 1204

<210> 21
 <211> 316
 <212> PRT
 <213> Plant

<400> 21

Met Lys Gly Asn Met Lys Val Tyr Trp Ile Lys Ile Ala Val Ala Thr
 1 5 10 15

Trp Phe Cys Cys Thr Thr Ile Val Leu Gly Ser Thr Ala Arg Ile Phe
 20 25 30

Ser Leu Pro Thr Asn Asp Glu Glu Glu Thr Ser Lys Thr Leu Gly Leu
 35 40 45

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

Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly Asn Ser
 65 70 75 80

His Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly Lys Cys
 85 90 95

Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala Glu Ile
 100 105 110

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

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

Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser Tyr Pro
 145 150 155 160

Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu Gly Ile
 165 170 175

Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala Ile Asp
 180 185 190

Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val Ile Gln
 195 200 205

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

Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile Ser Leu
 225 230 235 240

Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser Gly Ala
 245 250 255

Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn Gly Lys
 260 265 270

Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile Ala Leu
 275 280 285

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

Ile Ile Gln Asn Tyr Glu Ser Leu Val Gly Phe Asp
 305 310 315

<210> 22
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic Primer

<400> 22
 ggagaaggca actccagtca gaac

24

<210> 23
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Synthetic Primer

<400> 23

gtccatgtct ttggggatga attg

24