

SEQUENCE LISTING

<110> SUTRO BIOPHARMA, INC.

<120> E. COLI STRAINS HAVING AN OXIDATIVE CYTOPLASM

<130> 091200-1165216-006710PC

<140> PCT/US2019/060345

<141> 2019-11-07

<150> 62/757,498

<151> 2018-11-08

<160> 15

<170> PatentIn version 3.5

<210> 1

<211> 711

<212> DNA

<213> Escherichia coli

<400> 1

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cccgcgcctg tagctggcat gaagacagtt ctgactaaca gcggcgtgtt gtacatcacc    180
gatgatggta aacatatcat tcaggggccca atgtatgacg ttagtggcac ggctccggtc    240
aatgtcacca ataagatgct gttaaagcag ttgaatgcgc ttgaaaaaga gatgatcgtt    300
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tgccacaaac tgcattagca aatggcagac tacaacgcgc tggggatcac cgtgcgttat    420
cttgctttcc cgcgccaggg gctggacagc gatgcagaga aagaaatgaa agctatctgg    480
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<210> 2

<211> 564

<212> DNA

<213> Escherichia coli

<400> 2

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 actggcgccc tgaccgtaa cttcgacaac atgcgtgaag atgaaggtct ggctgaccgt 360
 gcgaccttcg ttgtgacct gcagggtatc atccaggcaa tcgaagttac cgctgaaggc 420
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 caccaggtg aagtttggcc ggctaaatgg aaagaagggtg aagcaactct ggctccgtct 540
 ctggacctgg ttgtaaaat ctaa 564

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 <212> PRT
 <213> Escherichia coli

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 Lys Asn Gly Glu Phe Ile Glu Ile Thr Glu Lys Asp Thr Glu Gly Arg
 20 25 30

 Trp Ser Val Phe Phe Phe Tyr Pro Ala Asp Phe Thr Phe Val Cys Pro
 35 40 45

 Thr Glu Leu Gly Asp Val Ala Asp His Tyr Glu Glu Leu Gln Lys Leu
 50 55 60

 Gly Val Asp Val Tyr Ala Val Ser Thr Asp Thr His Phe Thr His Lys
 65 70 75 80

 Ala Trp His Ser Ser Ser Glu Thr Ile Ala Lys Ile Lys Tyr Ala Met
 85 90 95

 Ile Gly Asp Pro Thr Gly Ala Leu Thr Arg Asn Phe Asp Asn Met Arg
 100 105 110

Glu Asp Glu Gly Leu Ala Asp Arg Ala Thr Phe Val Val Asp Pro Gln
115 120 125

Gly Ile Ile Gln Ala Ile Glu Val Thr Ala Glu Gly Ile Gly Arg Asp
130 135 140

Ala Ser Asp Leu Leu Arg Lys Ile Lys Ala Ala Gln Tyr Val Ala Ser
145 150 155 160

His Pro Gly Glu Val Cys Pro Ala Lys Trp Lys Glu Gly Glu Ala Thr
165 170 175

Leu Ala Pro Ser Leu Asp Leu Val Gly Lys Ile
180 185

<210> 4

<211> 564

<212> DNA

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
polynucleotide"

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ccggcgggact ttacttttgt ttgtcctacc gagctgggtg acgttgcgga ccattatgaa 180

gaactgcaga aattgggcgt cgacgtttac gccgtcagca cggacacgca cttacgcac 240

aaggcatggc actctagcag cgaaaccatc gcaaagatca aatacgcaat gattggcgac 300

ccgacgggtg cactgacccg caatttcgat aacatgcgtg aagatgaagg cctggcggat 360

cgtgcgacct tcgtcgtgga cccgcagggt atcattcagg ctatcgaagt taccgccgag 420

ggtattggtc gtgatgcgag cgatctgctg cgcaagatta aagccgcgca atacgttgca 480

tcccatccgg gcgaagtgtg cccagccaag tggaaagagg gcgaggcgac cctggcgccg 540

agcctggact tgggtggtaa gatt 564

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<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

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Met Ser Leu Ile Asn Thr Lys Ile Lys Pro Phe Lys Asn Gln Ala Phe
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Lys Asn Gly Glu Phe Ile Glu Ile Thr Glu Lys Asp Thr Glu Gly Arg
20 25 30

Trp Ser Val Phe Phe Phe Tyr Pro Ala Asp Phe Thr Phe Val Cys
35 40 45

Pro Thr Glu Leu Gly Asp Val Ala Asp His Tyr Glu Glu Leu Gln Lys
50 55 60

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

Lys Ala Trp His Ser Ser Ser Glu Thr Ile Ala Lys Ile Lys Tyr Ala
85 90 95

Met Ile Gly Asp Pro Thr Gly Ala Leu Thr Arg Asn Phe Asp Asn Met
100 105 110

Arg Glu Asp Glu Gly Leu Ala Asp Arg Ala Thr Phe Val Val Asp Pro
115 120 125

Gln Gly Ile Ile Gln Ala Ile Glu Val Thr Ala Glu Gly Ile Gly Arg
130 135 140

Asp Ala Ser Asp Leu Leu Arg Lys Ile Lys Ala Ala Gln Tyr Val Ala
145 150 155 160

Ser His Pro Gly Glu Val Cys Pro Ala Lys Trp Lys Glu Gly Glu Ala
165 170 175

Thr Leu Ala Pro Ser Leu Asp Leu Val Gly Lys Ile
180 185

<210> 6

<211> 236

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 6

Met Lys Lys Gly Phe Met Leu Phe Thr Leu Leu Ala Ala Phe Ser Gly
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Phe Ala Gln Ala Asp Asp Ala Ala Ile Gln Gln Thr Leu Ala Lys Met
20 25 30

Gly Ile Lys Ser Ser Asp Ile Gln Pro Ala Pro Val Ala Gly Met Lys
35 40 45

Thr Val Leu Thr Asn Ser Gly Val Leu Tyr Ile Thr Asp Asp Gly Lys
50 55 60

His Ile Ile Gln Gly Pro Met Tyr Asp Val Ser Gly Thr Ala Pro Val
65 70 75 80

Asn Val Thr Asn Lys Met Leu Leu Lys Gln Leu Asn Ala Leu Glu Lys
85 90 95

Glu Met Ile Val Tyr Lys Ala Pro Gln Glu Lys His Val Ile Thr Val
100 105 110

Phe Thr Asp Ile Thr Cys Gly Tyr Cys His Lys Leu His Glu Gln Met
115 120 125

Ala Asp Tyr Asn Ala Leu Gly Ile Thr Val Arg Tyr Leu Ala Phe Pro
130 135 140

Arg Gln Gly Leu Asp Ser Asp Ala Glu Lys Glu Met Lys Ala Ile Trp
145 150 155 160

Cys Ala Lys Asp Lys Asn Lys Ala Phe Asp Asp Val Met Ala Gly Lys
165 170 175

Ser Val Ala Pro Ala Ser Cys Asp Val Asp Ile Ala Asp His Tyr Ala
180 185 190

Leu Gly Val Gln Leu Gly Val Ser Gly Thr Pro Ala Val Val Leu Ser
195 200 205

Asn Gly Thr Leu Val Pro Gly Tyr Gln Pro Pro Lys Glu Met Lys Glu
210 215 220

Phe Leu Asp Glu His Gln Lys Met Thr Ser Gly Lys
225 230 235

<210> 7
<211> 330
<212> DNA
<213> Escherichia coli

<400> 7
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ccgattctgg atgaaatcgc tgacgaatat cagggcacaaac tgaccgttgc aaaactgaac 180
atcgatcaaaa accctggcac tgcgccgaaa tatggcatcc gtggtatccc gactctgctg 240
ctgttcaaaa acggtgaagt ggccggcaacc aaagtgggtg cactgtctaa aggtcagttg 300
aaagagttcc tcgacgctaa cctggcgtaa 330

<210> 8
<211> 109
<212> PRT
<213> Escherichia coli

<400> 8
Met Ser Asp Lys Ile Ile His Leu Thr Asp Asp Ser Phe Asp Thr Asp
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Val Leu Lys Ala Asp Gly Ala Ile Leu Val Asp Phe Trp Ala Glu Trp
20 25 30

Cys Gly Pro Cys Lys Met Ile Ala Pro Ile Leu Asp Glu Ile Ala Asp
35 40 45

Glu Tyr Gln Gly Lys Leu Thr Val Ala Lys Leu Asn Ile Asp Gln Asn

50 55 60

Pro Gly Thr Ala Pro Lys Tyr Gly Ile Arg Gly Ile Pro Thr Leu Leu
65 70 75 80

Leu Phe Lys Asn Gly Glu Val Ala Ala Thr Lys Val Gly Ala Leu Ser
85 90 95

Lys Gly Gln Leu Lys Glu Phe Leu Asp Ala Asn Leu Ala
100 105

<210> 9

<211> 966

<212> DNA

<213> Escherichia coli

<400> 9

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ggcggccaac tgaccaccac cacggaagtg gaaaactggc ctggcgatcc aaacgatctg 180

accggtccgt tattaatgga gcgcatgcac gaacatgcca ccaagttga aactgagatc 240

atttttgatc atatcaacaa ggtggatctg caaaaccgtc cgttccgtct gaatggcgat 300

aacggcgaat acacttgcca cgcgctgatt attgccaccg gagcttctgc acgctatctc 360

ggcctgcctt ctgaagaagc cttaaaggc cgtggggttt ctgcttgtgc aacctgcgac 420

ggtttcttct atcgcaacca gaaagttgcg gtcacggcg gcggcaatac cgcggttgaa 480

gaggcgctgt atctgtctaa catcgcttcg gaagtgcac tgattaccg ccgtgacggt 540

ttccgcgcgg aaaaaatcct cattaagcgc ctgatggata aagtggagaa cggaacatc 600

attctgcaca ccaaccgtac gctggaagaa gtgaccggcg atcaaatggg tgcactggc 660

gttcgtctgc gcgatacgca aaacagcgat aacatcgagt cactcgacgt tgccggtctg 720

ttgttgcta tcggtcacag cccgaatact gcgattttcg aagggcagct ggaactggaa 780

aacggctaca tcaaagtaca gtcgggtatt catggtaatg ccaccagac cagcattcct 840

ggcgtctttg ccgcaggcga cgtgatggat cacatttacc gccaggccat tacttcggcc 900

ggtacaggct gcatggcagc acttgatgcg gaacgctacc tcgatggtt agctgacgca 960

aaataa

966

<210> 10

<211> 321

<212> PRT

<213> Escherichia coli

<400> 10

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Ala Gly Tyr Thr Ala Ala Val Tyr Ala Ala Arg Ala Asn Leu Gln Pro
20 25 30

Val Leu Ile Thr Gly Met Glu Lys Gly Gly Gln Leu Thr Thr Thr Thr
35 40 45

Glu Val Glu Asn Trp Pro Gly Asp Pro Asn Asp Leu Thr Gly Pro Leu
50 55 60

Leu Met Glu Arg Met His Glu His Ala Thr Lys Phe Glu Thr Glu Ile
65 70 75 80

Ile Phe Asp His Ile Asn Lys Val Asp Leu Gln Asn Arg Pro Phe Arg
85 90 95

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

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

Lys Gly Arg Gly Val Ser Ala Cys Ala Thr Cys Asp Gly Phe Phe Tyr
130 135 140

Arg Asn Gln Lys Val Ala Val Ile Gly Gly Gly Asn Thr Ala Val Glu
145 150 155 160

Glu Ala Leu Tyr Leu Ser Asn Ile Ala Ser Glu Val His Leu Ile His
165 170 175

Arg Arg Asp Gly Phe Arg Ala Glu Lys Ile Leu Ile Lys Arg Leu Met
180 185 190

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

Glu Glu Val Thr Gly Asp Gln Met Gly Val Thr Gly Val Arg Leu Arg
210 215 220

Asp Thr Gln Asn Ser Asp Asn Ile Glu Ser Leu Asp Val Ala Gly Leu
225 230 235 240

Phe Val Ala Ile Gly His Ser Pro Asn Thr Ala Ile Phe Glu Gly Gln
245 250 255

Leu Glu Leu Glu Asn Gly Tyr Ile Lys Val Gln Ser Gly Ile His Gly
260 265 270

Asn Ala Thr Gln Thr Ser Ile Pro Gly Val Phe Ala Ala Gly Asp Val
275 280 285

Met Asp His Ile Tyr Arg Gln Ala Ile Thr Ser Ala Gly Thr Gly Cys
290 295 300

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

Lys

<210> 11

<211> 1353

<212> DNA

<213> Escherichia coli

<400> 11

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acctgcgtaa atgttggtg tgtgccgaaa aaagtgatgt ggcacgcggc gcaaaccgt 180

gaagcgatcc atatgtacgg cccggattat ggttttgata ccactatcaa taaattcaac 240

tgggaaacgt tgatcgccag ccgtaccgcc tatatcgacc gtattcatac ttctatgaa 300

aacgtgctcg gtaaaaataa cgttgatgta atcaaaggct ttgcccgtt cgttgatgcc 360

aaaacgctgg aggtaaacgg cgaaaccatc acggccgac atattctgat cgccacaggc 420

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 gaaggcccg agctgcacac caacgccatc ccgaaagcgg tagtgaaaaa taccgatggt 720
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 gtgggcgata acacgggtgc agtggagctg acaccggtgg cagttgcagc gggtcgccgt 960
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 acggcggcag aagagttcgt gacaatgcgt taa 1353

<210> 12
 <211> 450
 <212> PRT
 <213> Escherichia coli

<400> 12
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 1 5 10 15

Ile Ala Ser Ile Asn Arg Ala Ala Met Tyr Gly Gln Lys Cys Ala Leu
 20 25 30

Ile Glu Ala Lys Glu Leu Gly Gly Thr Cys Val Asn Val Gly Cys Val
 35 40 45

Pro Lys Lys Val Met Trp His Ala Ala Gln Ile Arg Glu Ala Ile His
 50 55 60

Met Tyr Gly Pro Asp Tyr Gly Phe Asp Thr Thr Ile Asn Lys Phe Asn
65 70 75 80

Trp Glu Thr Leu Ile Ala Ser Arg Thr Ala Tyr Ile Asp Arg Ile His
 85 90 95

Thr Ser Tyr Glu Asn Val Leu Gly Lys Asn Asn Val Asp Val Ile Lys
 100 105 110

Gly Phe Ala Arg Phe Val Asp Ala Lys Thr Leu Glu Val Asn Gly Glu
 115 120 125

Thr Ile Thr Ala Asp His Ile Leu Ile Ala Thr Gly Gly Arg Pro Ser
 130 135 140

His Pro Asp Ile Pro Gly Val Glu Tyr Gly Ile Asp Ser Asp Gly Phe
145 150 155 160

Phe Ala Leu Pro Ala Leu Pro Glu Arg Val Ala Val Val Gly Ala Gly
 165 170 175

Tyr Ile Ala Val Glu Leu Ala Gly Val Ile Asn Gly Leu Gly Ala Lys
 180 185 190

Thr His Leu Phe Val Arg Lys His Ala Pro Leu Arg Ser Phe Asp Pro
 195 200 205

Met Ile Ser Glu Thr Leu Val Glu Val Met Asn Ala Glu Gly Pro Gln
210 215 220

Leu His Thr Asn Ala Ile Pro Lys Ala Val Val Lys Asn Thr Asp Gly
225 230 235 240

Ser Leu Thr Leu Glu Leu Glu Asp Gly Arg Ser Glu Thr Val Asp Cys
 245 250 255

Leu Ile Trp Ala Ile Gly Arg Glu Pro Ala Asn Asp Asn Ile Asn Leu
 260 265 270

Glu Ala Ala Gly Val Lys Thr Asn Glu Lys Gly Tyr Ile Val Val Asp
275 280 285

Lys Tyr Gln Asn Thr Asn Ile Glu Gly Ile Tyr Ala Val Gly Asp Asn
290 295 300

Thr Gly Ala Val Glu Leu Thr Pro Val Ala Val Ala Ala Gly Arg Arg
305 310 315 320

Leu Ser Glu Arg Leu Phe Asn Asn Lys Pro Asp Glu His Leu Asp Tyr
325 330 335

Ser Asn Ile Pro Thr Val Val Phe Ser His Pro Pro Ile Gly Thr Val
340 345 350

Gly Leu Thr Glu Pro Gln Ala Arg Glu Gln Tyr Gly Asp Asp Gln Val
355 360 365

Lys Val Tyr Lys Ser Ser Phe Thr Ala Met Tyr Thr Ala Val Thr Thr
370 375 380

His Arg Gln Pro Cys Arg Met Lys Leu Val Cys Val Gly Ser Glu Glu
385 390 395 400

Lys Ile Val Gly Ile His Gly Ile Gly Phe Gly Met Asp Glu Met Leu
405 410 415

Gln Gly Phe Ala Val Ala Leu Lys Met Gly Ala Thr Lys Lys Asp Phe
420 425 430

Asp Asn Thr Val Ala Ile His Pro Thr Ala Ala Glu Glu Phe Val Thr
435 440 445

Met Arg
450

<210> 13

<211> 1557

<212> DNA

<213> Escherichia coli

<400> 13

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acaacaggtc atcctgaagc attaggttcc gactgacgc acaaatggat tactaccgat 180
 ttgcggaag cattgctgga attcattaca ccagtggatg gtgatattga acatatgctg 240
 acctttatgc gcgatctgca tcgttatacg gcgcgcaata tggcgatga gcggatgtgg 300
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 acttctaaca ccggacgctt taaaacgctg tatcgtgaag ggctgaaaaa tcgctacggc 420
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 caagcgaagt gcggtgatat ctgggctgct gatgccaaag agaaaatttc tgcgggctat 540
 ttccggtta tccgaatta ctatcgttcc ggttgggtca ttccttatct gtttggtgca 600
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 accgagtgcg gtatgtatta cctgccgtat gcgacctctc ttcgtttgag cgatctcggc 720
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 aaagacggta agaggctgca aatcaacagc aacgtgttgc agattgaaaa cgaactgtac 900
 gcgccgattc gtcaaaaacg cgttaccgc agcggcgagt cgccttctga tgcgctgta 960
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<210> 14

<211> 518

<212> PRT

<213> Escherichia coli

<400> 14

Met Ile Pro Asp Val Ser Gln Ala Leu Ala Trp Leu Glu Lys His Pro
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Gln Ala Leu Lys Gly Ile Gln Arg Gly Leu Glu Arg Glu Thr Leu Arg
20 25 30

Val Asn Ala Asp Gly Thr Leu Ala Thr Thr Gly His Pro Glu Ala Leu
35 40 45

Gly Ser Ala Leu Thr His Lys Trp Ile Thr Thr Asp Phe Ala Glu Ala
50 55 60

Leu Leu Glu Phe Ile Thr Pro Val Asp Gly Asp Ile Glu His Met Leu
65 70 75 80

Thr Phe Met Arg Asp Leu His Arg Tyr Thr Ala Arg Asn Met Gly Asp
85 90 95

Glu Arg Met Trp Pro Leu Ser Met Pro Cys Tyr Ile Ala Glu Gly Gln
100 105 110

Asp Ile Glu Leu Ala Gln Tyr Gly Thr Ser Asn Thr Gly Arg Phe Lys
115 120 125

Thr Leu Tyr Arg Glu Gly Leu Lys Asn Arg Tyr Gly Ala Leu Met Gln
130 135 140

Thr Ile Ser Gly Val His Tyr Asn Phe Ser Leu Pro Met Ala Phe Trp
145 150 155 160

Gln Ala Lys Cys Gly Asp Ile Ser Gly Ala Asp Ala Lys Glu Lys Ile
165 170 175

Ser Ala Gly Tyr Phe Arg Val Ile Arg Asn Tyr Tyr Arg Phe Gly Trp
180 185 190

Val Ile Pro Tyr Leu Phe Gly Ala Ser Pro Ala Ile Cys Ser Ser Phe
195 200 205

Leu Gln Gly Lys Pro Thr Ser Leu Pro Phe Glu Lys Thr Glu Cys Gly
210 215 220

Met Tyr Tyr Leu Pro Tyr Ala Thr Ser Leu Arg Leu Ser Asp Leu Gly
225 230 235 240

Tyr Thr Asn Lys Ser Gln Ser Asn Leu Gly Ile Thr Phe Asn Asp Leu
245 250 255

Tyr Glu Tyr Val Ala Gly Leu Lys Gln Ala Ile Lys Thr Pro Ser Glu
260 265 270

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

Asn Ser Asn Val Leu Gln Ile Glu Asn Glu Leu Tyr Ala Pro Ile Arg
290 295 300

Pro Lys Arg Val Thr Arg Ser Gly Glu Ser Pro Ser Asp Ala Leu Leu
305 310 315 320

Arg Gly Gly Ile Glu Tyr Ile Glu Val Arg Ser Leu Asp Ile Asn Pro
325 330 335

Phe Ser Pro Ile Gly Val Asp Glu Gln Gln Val Arg Phe Leu Asp Leu
340 345 350

Phe Met Val Trp Cys Ala Leu Ala Asp Ala Pro Glu Met Ser Ser Ser
355 360 365

Glu Leu Ala Cys Thr Arg Val Asn Trp Asn Arg Val Ile Leu Glu Gly
370 375 380

Arg Lys Pro Gly Leu Thr Leu Gly Ile Gly Cys Glu Thr Ala Gln Phe
385 390 395 400

Pro Leu Pro Gln Val Gly Lys Asp Leu Phe Arg Asp Leu Lys Arg Val
405 410 415

Ala Gln Thr Leu Asp Ser Ile Asn Gly Gly Glu Ala Tyr Gln Lys Val
420 425 430

Cys Asp Glu Leu Val Ala Cys Phe Asp Asn Pro Asp Leu Thr Phe Ser

435 440 445

Ala Arg Ile Leu Arg Ser Met Ile Asp Thr Gly Ile Gly Gly Thr Gly
450 455 460

Lys Ala Phe Ala Glu Ala Tyr Arg Asn Leu Leu Arg Glu Glu Pro Leu
465 470 475 480

Glu Ile Leu Arg Glu Glu Asp Phe Val Ala Glu Arg Glu Ala Ser Glu
485 490 495

Arg Arg Gln Gln Glu Met Glu Ala Ala Asp Thr Glu Pro Phe Ala Val
500 505 510

Trp Leu Glu Lys His Ala
515

<210> 15

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 15

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Val Ala Pro Gly Lys
1 5 10 15

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

His Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Ala Leu Val Ile Tyr
35 40 45

Tyr Gly Ser Asn Arg Pro Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser
50 55 60

Asn Ser Gly Asn Thr Ala Thr Leu Thr Ile Ser Arg Val Glu Ala Gly
65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Gln Val Trp Asp Ser Ser Ser Asp Trp

85

90

95

Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu
100 105