SEQUENCE LISTING

<110> NOVARTIS AG

<120> METHOD OF MANUFACTURING BISPECIFIC ANTIBODIES, BISPECIFIC ANTIBODIES AND THERAPEUTIC USE OF SUCH ANTIBODIES

<130> PAT057716-WO-PCT

<140>
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<150> 62/518,090
<151> 2017-06-12

<160> 104

<170> PatentIn version 3.5

<210> 1
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<212> PRT
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<220>
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<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 1
Ser Tyr Ala Ile Ser
1 5

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<220>
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<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 2
Asn Ile Ile Pro Met Thr Gly Gln Thr Tyr Tyr Ala Gln Lys Phe Gln
1 5 10 15

Gly

<210> 3
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<212> PRT
<213> Artificial Sequence

<220>
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peptide"

<400> 3
Ala Ala Tyr His Pro Leu Val Phe Asp Asn
1 5 10

<210> 4
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<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 4
Gly Gly Thr Phe Lys Ser Tyr
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<210> 5
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<212> PRT
<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 5
Ile Pro Met Thr Gly Gln
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<210> 6
<211> 10
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<213> Artificial Sequence

<220>
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peptide"

<400> 6
Ala Ala Tyr His Pro Leu Val Phe Asp Asn
1 5 10

<210> 7
<211> 119
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<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 7
Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Lys Ser Tyr
20 25 30

Ala Ile Ser Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35 40 45

Gly Asn Ile Ile Pro Met Thr Gly Gln Thr Tyr Tyr Ala Gln Lys Phe
50 55 60

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

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Ala Ala Tyr His Pro Leu Val Phe Asp Asn Trp Gly Gln Gly
100 105 110

Thr Leu Val Thr Val Ser Ser
115

<210> 8
<211> 356
<212> DNA

<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic
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gaggtgcagc tggtgcagag cggcgccgag gtgaagaagc ccggcagcag cgtgaaggtg 60

agctgcaagg ccagcggcgg caccttcaag agctacgcca tcagctgggt gaggcaggcc 120

cccggccagg gcctggagtg gatgggcaac atcatcccca tgaccggcca gacctactac 180

gcccagaagt tccagggcag ggtgaccatc accgccgacg agagcaccag caccgcctac 240

atggagctga gcagcctgag gagcgaggac accgccgtgt actactgcgc cagggccgcc 300

taccaccccc tggtgttcga caactgggcc agggcaccct ggtgaccgtg agcagc 356

<210> 9
<211> 449
<212> PRT
<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 9
Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Lys Ser Tyr
20 25 30

Ala Ile Ser Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35 40 45

Gly Asn Ile Ile Pro Met Thr Gly Gln Thr Tyr Tyr Ala Gln Lys Phe
50 55 60

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

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys

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                85                  90                  95

Ala Arg Ala Ala Tyr His Pro Leu Val Phe Asp Asn Trp Gly Gln Gly
            100                 105                 110

Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe
        115                 120                 125

Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu
    130                 135                 140

Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp
145                 150                 155                 160

Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu
                165                 170                 175

Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser
            180                 185                 190

Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro
        195                 200                 205

Ser Asn Thr Lys Val Asp Lys Arg Val Glu Pro Lys Ser Cys Asp Lys
    210                 215                 220

Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro
225                 230                 235                 240

Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser
                245                 250                 255

Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp
            260                 265                 270

Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn
        275                 280                 285

Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val
    290                 295                 300
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Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu
305                 310                 315                 320


Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys
                325                 330                 335


Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr
            340                 345                 350


Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr
        355                 360                 365


Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu
    370                 375                 380


Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu
385                 390                 395                 400


Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys
                405                 410                 415


Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu
            420                 425                 430


Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly
        435                 440                 445


Lys
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<210> 10
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<220>
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gaggtgcagc tggtgcagag cggcgccgag gtgaagaagc ccggcagcag cgtgaaggtg 60

agctgcaagg ccagcggcgg caccttcaag agctacgcca tcagctgggt gaggcaggcc 120

cccggccagg gcctggagtg gatgggcaac atcatcccca tgaccggcca gacctactac 180

gcccagaagt tccagggcag ggtgaccatc accgccgacg agagcaccag caccgcctac 240

atggagctga gcagcctgag gagcgaggac accgccgtgt actactgcgc cagggccgcc 300

taccaccccc tggtgttcga caactggggc cagggcaccc tggtgaccgt gagcagcgcc 360

agcaccaagg gccccagcgt gttccccctg gcccccagca gcaagagcac cagcggcggc 420

accgccgccc tgggctgcct ggtgaaggac tacttccccg agcccgtgac cgtgagctgg 480

aacagcggcg ccctgaccag cggcgtgcac accttccccg ccgtgctgca gagcagcggc 540

ctgtacagcc tgagcagcgt ggtgaccgtg cccagcagca gcctgggcac ccagacctac 600

atctgcaacg tgaaccacaa gcccagcaac accaaggtgg acaagagggt ggagcccaag 660

agctgcgaca agacccacac ctgcccccc tgccccgccc ccgaggccgc cggcggcccc 720

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gccaagggcc agcccaggga gccccaggtg tacaccctgc cccccagcag ggaggagatg 1080

accaagaacc aggtgagcct gacctgcctg gtgaagggct tctaccccag cgacatcgcc 1140

gtggagtggg agagcaacgg ccagcccgag aacaactaca agaccacccc ccccgtgctg 1200

gacagcgacg gcagcttctt cctgtacagc aagctgaccg tggacaagag caggtggcag 1260

cagggcaacg tgttcagctg cagcgtgatg cacgaggccc tgcacaacca ctacacccag 1320

aagagcctga gcctgagccc cggcaag 1347

<210> 11
<211> 13
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<220>

<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 11
Ser Gly Ser Ser Ser Asn Ile Gly Asn His Tyr Val Asn
1 5 10

<210> 12
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 12
Arg Asn Asn His Arg Pro Ser
1 5

<210> 13
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 13
Gln Ser Trp Asp Tyr Ser Gly Phe Ser Thr Val
1 5 10

<210> 14
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic
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<400> 14
Ser Ser Ser Asn Ile Gly Asn His Tyr
1 5

<210> 15
<211> 3
<212> PRT
<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic
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<400> 15
Arg Asn Asn
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<210> 16
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 16
Trp Asp Tyr Ser Gly Phe Ser Thr
1 5

<210> 17
<211> 110
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 17
Asp Ile Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn His
20 25 30

Tyr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Arg Asn Asn His Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
    50   55   60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu Gln
65   70   75   80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Trp Asp Tyr Ser Gly
                85   90   95

Phe Ser Thr Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu
            100   105   110

<210> 18
<211> 330
<212> DNA
<213> Artificial Sequence

<220>
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      polynucleotide"

<400> 18
gatatcgtcc tgactcagcc ccctagcgtc agcggcgctc ccggtcagag agtgactatt 60

agctgtagcg gctctagctc taatatcggt aatcactacg tgaactggta tcagcagctg 120

cccggcaccg cccctaagct gctgatctat agaaacaatc accggcctag cggcgtgccc 180

gataggttta gcggatctaa gtcaggcact agcgctagtc tggctatcac cggactgcag 240

tcagaggacg aggccgacta ctactgtcag tcctgggact atagcggctt tagcaccgtg 300

ttcggcggag gcactaagct gaccgtgctg   330

<210> 19
<211> 216
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 19
Asp Ile Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln

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1               5                   10                  15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn His
            20                  25                  30

Tyr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
        35                  40                  45

Ile Tyr Arg Asn Asn His Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
    50                  55                  60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu Gln
65                  70                  75                  80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Trp Asp Tyr Ser Gly
                85                  90                  95

Phe Ser Thr Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Gln
            100                 105                 110

Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu
        115                 120                 125

Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr
    130                 135                 140

Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys
145                 150                 155                 160

Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr
                165                 170                 175

Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His
            180                 185                 190

Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu Lys
        195                 200                 205

Thr Val Ala Pro Thr Glu Cys Ser
    210                 215
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<210> 20
<211> 648
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
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<400> 20
gatatcgtcc tgactcagcc ccctagcgtc agcggcgctc ccggtcagag agtgactatt 60

agctgtagcg gctctagctc taatatcggt aatcactacg tgaactggta tcagcagctg 120

cccggcaccg cccctaagct gctgatctat agaaacaatc accggcctag cggcgtgccc 180

gataggttta gcggatctaa gtcaggcact agcgctagtc tggctatcac cggactgcag 240

tcagaggacg aggccgacta ctactgtcag tcctgggact atagcggctt tagcaccgtg 300

ttcggcggag gcactaagct gaccgtgctg ggtcagccta aggctgcccc cagcgtgacc 360

ctgttccccc ccagcagcga ggagctgcag gccaacaagg ccaccctggt gtgcctgatc 420

agcgacttct acccaggcgc cgtgaccgtg gcctggaagg ccgacagcag ccccgtgaag 480

gccggcgtgg agaccaccac ccccagcaag cagagcaaca acaagtacgc cgccagcagc 540

tacctgagcc tgacccccga gcagtggaag agccacaggt cctacagctg ccaggtgacc 600

cacgagggca gcaccgtgga aaagaccgtg gccccaaccg agtgcagc 648

<210> 21
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 21
Val Tyr Gly Met Asn
1 5

<210> 22
<211> 17

<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 22
Ile Ile Trp Tyr Asp Gly Asp Asn Gln Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> 23
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 23
Asp Leu Arg Thr Gly Pro Phe Asp Tyr
1 5

<210> 24
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
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<400> 24
Gly Phe Thr Phe Ser Val Tyr
1 5

<210> 25
<211> 6
<212> PRT
<213> Artificial Sequence

<220>

<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 25
Trp Tyr Asp Gly Asp Asn
1 5

<210> 26
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 26
Asp Leu Arg Thr Gly Pro Phe Asp Tyr
1 5

<210> 27
<211> 118
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 27
Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1 5 10 15

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

Gly Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ala Ile Ile Trp Tyr Asp Gly Asp Asn Gln Tyr Tyr Ala Asp Ser Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65 70 75 80

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Leu Gln Met Asn Gly Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
                85                  90                  95


Ala Arg Asp Leu Arg Thr Gly Pro Phe Asp Tyr Trp Gly Gln Gly Thr
            100                 105                 110


Leu Val Thr Val Ser Ser
        115


<210> 28
<211> 354
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polynucleotide"

<400> 28
caggtgcagc tggtggagag cggcggcggc gtggtgcagc ccggcaggag cctgaggctg       60

agctgcgccg ccagcggctt caccttcagc gtgtacggca tgaactgggt gaggcaggcc      120

cccggcaagg gcctggagtg ggtggccatc atctggtacg acggcgacaa ccagtactac      180

gccgacagcg tgaagggcag gttcaccatc agcagggaca acagcaagaa caccctgtac      240

ctgcagatga acggcctgag ggccgaggac accgccgtgt actactgcgc cagggacctg      300

aggaccggcc ccttcgacta ctggggccag ggcaccctgg tgaccgtgag cagc            354


<210> 29
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 29
Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1               5                   10                  15
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Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Val Tyr
            20                  25                  30

Gly Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
        35                  40                  45

Ala Ile Ile Trp Tyr Asp Gly Asp Asn Gln Tyr Tyr Ala Asp Ser Val
    50                  55                  60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65                  70                  75                  80

Leu Gln Met Asn Gly Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
                85                  90                  95

Ala Arg Asp Leu Arg Thr Gly Pro Phe Asp Tyr Trp Gly Gln Gly Thr
            100                 105                 110

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
        115                 120                 125

Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly
    130                 135                 140

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
145                 150                 155                 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
                165                 170                 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
            180                 185                 190

Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser
        195                 200                 205

Asn Thr Lys Val Asp Lys Arg Val Glu Pro Lys Ser Cys Asp Lys Thr
    210                 215                 220

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
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```
225                 230                 235                 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
                245                 250                 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
            260                 265                 270

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
        275                 280                 285

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
    290                 295                 300

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305                 310                 315                 320

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
                325                 330                 335

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
            340                 345                 350

Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys
        355                 360                 365

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
    370                 375                 380

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
385                 390                 395                 400

Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser
                405                 410                 415

Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
            420                 425                 430

Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
        435                 440                 445
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<210> 30
<211> 1344
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polynucleotide"

<400> 30
caggtgcagc tggtggagag cggcggcggc gtggtgcagc ccggcaggag cctgaggctg 60

agctgcgccg ccagcggctt caccttcagc gtgtacggca tgaactgggt gaggcaggcc 120

cccggcaagg gcctggagtg ggtggccatc atctggtacg acggcgacaa ccagtactac 180

gccgacagcg tgaagggcag gttcaccatc agcagggaca acagcaagaa caccctgtac 240

ctgcagatga acggcctgag ggccgaggac accgccgtgt actactgcgc cagggacctg 300

aggaccggcc ccttcgacta ctggggccag ggcaccctgg tgaccgtgag cagcgccagc 360

accaagggcc ccagcgtgtt ccccctggcc cccagcagca agagcaccag cggcggcacc 420

gccgccctgg gctgcctggt gaaggactac ttccccgagc ccgtgaccgt gagctggaac 480

agcggcgccc tgaccagcgg cgtgcacacc ttccccgccg tgctgcagag cagcggcctg 540

tacagcctga gcagcgtggt gaccgtgccc agcagcagcc tgggcaccca gacctacatc 600

tgcaacgtga accacaagcc cagcaacacc aaggtggaca agagggtgga gcccaagagc 660

tgcgacaaga cccacacctg ccccccctgc cccgcccccg agctgctggg cggccccagc 720

gtgttcctgt tcccccccaa gcccaaggac accctgatga tcagcaggac ccccgaggtg 780

acctgcgtgg tggtggacgt gagccacgag gaccccgagg tgaagttcaa ctggtacgtg 840

gacggcgtgg aggtgcacaa cgccaagacc aagcccaggg aggagcagta caacagcacc 900

tacagggtgg tgagcgtgct gaccgtgctg caccaggact ggctgaacgg caaggagtac 960

aagtgcaagg tgagcaacaa ggccctgccc gcccccatcg agaagaccat cagcaaggcc 1020

aagggccagc ccagggagcc ccaggtgtac accctgcccc ccagcaggga ggagatgacc 1080

aagaaccagg tgagcctgac ctgcctggtg aagggcttct accccagcga catcgccgtg 1140

gagtgggaga gcaacggcca gcccgagaac aactacaaga ccacccccc cgtgctggac 1200

agcgacggca gcttcttcct gtacagcaag ctgaccgtgg acaagagcag gtggcagcag 1260

ggcaacgtgt tcagctgcag cgtgatgcac gaggccctgc acaaccacta cacccagaag 1320

agcctgagcc tgagccccgg caag 1344

<210> 31
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 31
Arg Ala Ser Gln Ser Ile Gly Ser Ser Leu His
1 5 10

<210> 32
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 32
Tyr Ala Ser Gln Ser Phe Ser
1 5

<210> 33
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 33
His Gln Ser Ser Ser Leu Pro Phe Thr
1 5

<210> 34

<211> 7
<212> PRT
<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 34
Ser Gln Ser Ile Gly Ser Ser
1 5

<210> 35
<211> 3
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<213> Artificial Sequence

<220>
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<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 35
Tyr Ala Ser
1

<210> 36
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<221> source
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peptide"

<400> 36
Ser Ser Ser Leu Pro Phe
1 5

<210> 37
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 37
Glu Ile Val Leu Thr Gln Ser Pro Asp Phe Gln Ser Val Thr Pro Lys
1   5   10   15

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

Leu His Trp Tyr Gln Gln Lys Pro Asp Gln Ser Pro Lys Leu Leu Ile
        35   40   45

Lys Tyr Ala Ser Gln Ser Phe Ser Gly Val Pro Ser Arg Phe Ser Gly
    50   55   60

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

Glu Asp Ala Ala Ala Tyr Tyr Cys His Gln Ser Ser Ser Leu Pro Phe
                85   90   95

Thr Phe Gly Pro Gly Thr Lys Val Asp Ile Lys
            100   105

<210> 38
<211> 321
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polynucleotide"

<400> 38
gagatcgtgc tgacccagtc acccgacttt cagtcagtga cccctaaaga aaaagtgact 60

atcacctgta gggcctccca gtctatcggc tctagcctgc actggtatca gcagaagccc 120

gatcagtcac ctaagctgct gattaagtac gcctctcagt cctttagcgg cgtgccctct 180

aggtttagcg gctcaggctc aggcaccgac ttcaccctga ctatcaatag cctggaagcc 240

gaggacgccg ctgcctacta ctgtcatcag tcaagtagcc tgcccttcac cttcggccct 300

ggcactaaag tggatattaa g   321

<210> 39
<211> 214
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 39
Glu Ile Val Leu Thr Gln Ser Pro Asp Phe Gln Ser Val Thr Pro Lys
1 5 10 15

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

Leu His Trp Tyr Gln Gln Lys Pro Asp Gln Ser Pro Lys Leu Leu Ile
35 40 45

Lys Tyr Ala Ser Gln Ser Phe Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

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

Glu Asp Ala Ala Ala Tyr Tyr Cys His Gln Ser Ser Ser Leu Pro Phe
85 90 95

Thr Phe Gly Pro Gly Thr Lys Val Asp Ile Lys Arg Thr Val Ala Ala
100 105 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser

165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
180 185 190

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
195 200 205

Phe Asn Arg Gly Glu Cys
210

<210> 40
<211> 642
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polynucleotide"

<400> 40
gagatcgtgc tgacccagtc acccgacttt cagtcagtga cccctaaaga aaaagtgact 60

atcacctgta gggcctccca gtctatcggc tctagcctgc actggtatca gcagaagccc 120

gatcagtcac ctaagctgct gattaagtac gcctctcagt cctttagcgg cgtgccctct 180

aggtttagcg gctcaggctc aggcaccgac ttcaccctga ctatcaatag cctggaagcc 240

gaggacgccg ctgcctacta ctgtcatcag tcaagtagcc tgcccttcac cttcggccct 300

ggcactaaag tggatattaa gcgtacggtg gccgctccca gcgtgttcat cttcccccc 360

agcgacgagc agctgaagag cggcaccgcc agcgtggtgt gcctgctgaa caacttctac 420

ccccgggagg ccaaggtgca gtggaaggtg gacaacgccc tgcagagcgg caacagccag 480

gagagcgtca ccgagcagga cagcaaggac tccacctaca gcctgagcag caccctgacc 540

ctgagcaagg ccgactacga gaagcataag gtgtacgcct gcgaggtgac ccaccagggc 600

ctgtccagcc ccgtgaccaa gagcttcaac aggggcgagt gc 642

<210> 41
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 41
Gly Phe Thr Phe Ser Val Tyr Gly Met Asn
1 5 10

<210> 42
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 42
Ile Ile Trp Tyr Asp Gly Asp Asn Gln Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> 43
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 43
Asp Leu Arg Thr Gly Pro Phe Asp Tyr
1 5

<210> 44
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic

peptide"

<400> 44
Val Tyr Gly Met Asn
1 5

<210> 45
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 45
Ile Ile Trp Tyr Asp Gly Asp Asn Gln Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> 46
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 46
Asp Leu Arg Thr Gly Pro Phe Asp Tyr
1 5

<210> 47
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 47
Gly Phe Thr Phe Ser Val Tyr

1 5

<210> 48
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 48
Trp Tyr Asp Gly Asp Asn
1 5

<210> 49
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 49
Asp Leu Arg Thr Gly Pro Phe Asp Tyr
1 5

<210> 50
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 50
Gly Phe Thr Phe Ser Val Tyr Gly
1 5

<210> 51
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 51
Ile Trp Tyr Asp Gly Asp Asn Gln
1 5

<210> 52
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 52
Ala Arg Asp Leu Arg Thr Gly Pro Phe Asp Tyr
1 5 10

<210> 53
<211> 118
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 53
Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1 5 10 15

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

Gly Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ala Ile Ile Trp Tyr Asp Gly Asp Asn Gln Tyr Tyr Ala Asp Ser Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr

65 70 75 80

Leu Gln Met Asn Gly Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Asp Leu Arg Thr Gly Pro Phe Asp Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser Ser
115

<210> 54
<211> 354
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polynucleotide"

<400> 54
caggtgcagc tggtggaatc aggcggcgga gtggtgcagc ctggtagatc actgagactg 60

agctgcgctg ctagtggctt cacctttagc gtctacggaa tgaactgggt ccgacaggcc 120

cctgggaaag gcctggagtg ggtggcaatt atctggtacg acggcgataa tcagtactac 180

gccgatagcg tgaagggacg gttcactatc tctagggata actctaagaa caccctgtac 240

ctgcagatga acggcctgag agccgaggac accgccgtct actactgcgc tagggacctg 300

agaaccggcc ccttcgacta ctggggacag ggcaccctgg tcaccgtgtc tagc 354

<210> 55
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 55
Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1 5 10 15

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

Gly Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
        35                  40                  45

Ala Ile Ile Trp Tyr Asp Gly Asp Asn Gln Tyr Tyr Ala Asp Ser Val
    50                  55                  60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65                  70                  75                  80

Leu Gln Met Asn Gly Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
                85                  90                  95

Ala Arg Asp Leu Arg Thr Gly Pro Phe Asp Tyr Trp Gly Gln Gly Thr
            100                 105                 110

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
        115                 120                 125

Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly
    130                 135                 140

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
145                 150                 155                 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
                165                 170                 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
            180                 185                 190

Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser
        195                 200                 205

Asn Thr Lys Val Asp Lys Arg Val Glu Pro Lys Ser Cys Asp Lys Thr
    210                 215                 220
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His Thr Cys Pro Pro Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro Ser
225                 230                 235                 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
                245                 250                 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
            260                 265                 270

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
        275                 280                 285

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
    290                 295                 300

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305                 310                 315                 320

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
                325                 330                 335

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Cys Thr Leu
            340                 345                 350

Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Ser Cys
        355                 360                 365

Ala Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
    370                 375                 380

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
385                 390                 395                 400

Ser Asp Gly Ser Phe Phe Leu Val Ser Lys Leu Thr Val Asp Lys Ser
                405                 410                 415

Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
            420                 425                 430

Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
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435 440 445

<210> 56
<211> 1344
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polynucleotide"

<400> 56
caggtgcagc tggtggaatc aggcggcgga gtggtgcagc ctggtagatc actgagactg 60

agctgcgctg ctagtggctt cacctttagc gtctacggaa tgaactgggt ccgacaggcc 120

cctgggaaag gcctggagtg ggtggcaatt atctggtacg acggcgataa tcagtactac 180

gccgatagcg tgaagggacg gttcactatc tctagggata actctaagaa caccctgtac 240

ctgcagatga acggcctgag agccgaggac accgccgtct actactgcgc tagggacctg 300

agaaccggcc ccttcgacta ctggggacag ggcaccctgg tcaccgtgtc tagcgcctct 360

actaagggcc caagcgtgtt ccccctggcc cctagctcta agtctactag cggaggcacc 420

gccgctctgg gctgcctggt caaggactac ttccccgagc ccgtgaccgt cagctggaat 480

agcggcgctc tgactagcgg agtgcacacc ttccccgccg tgctgcagtc tagcggcctg 540

tatagcctgt ctagcgtcgt gaccgtgcct agctctagcc tgggcactca gacctatatc 600

tgtaacgtga accacaagcc ctctaacact aaggtggaca agcgggtgga acctaagtcc 660

tgcgataaga ctcacacctg tcctccctgc cctgcccctg aggctgccgg aggacctagc 720

gtgttcctgt tcccacctaa gcctaaagac accctgatga tctctaggac ccccgaagtg 780

acctgcgtgg tggtggacgt ctcacacgag gaccctgaag tgaagtttaa ttggtacgtg 840

gacggcgtgg aagtgcacaa cgctaagact aagcctagag aggaacagta taactctacc 900

tatagggtcg tcagcgtgct gacagtgctg caccaggact ggctgaacgg gaaagagtat 960

aagtgtaaag tgtctaacaa ggccctgcca gcccctatcg aaaagactat ctctaaggct 1020

aaggggcagc ctagagaacc ccaagtgtgc actctgcccc ctagtagaga agagatgact 1080

aagaatcagg tgtcactgag ctgtgccgtg aagggcttct accctagcga tatcgccgtg 1140

gagtgggaga gcaacggcca gcccgagaac aactacaaga ccacccccc agtgctggac 1200

agcgacggca gcttcttcct ggtgagcaag ctgaccgtgg acaagtccag gtggcagcag 1260

ggcaacgtgt tcagctgcag cgtgatgcac gaggccctgc acaaccacta cacccagaag 1320

tccctgagcc tgagccccgg caag 1344

<210> 57
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 57
Arg Ala Ser Gln Ser Ile Gly Ser Ser Leu His
1 5 10

<210> 58
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 58
Tyr Ala Ser Gln Ser Phe Ser
1 5

<210> 59
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 59
His Gln Ser Ser Ser Leu Pro Phe Thr
1 5

<210> 60
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 60
Arg Ala Ser Gln Ser Ile Gly Ser Ser Leu His
1 5 10

<210> 61
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 61
Tyr Ala Ser Gln Ser Phe Ser
1 5

<210> 62
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 62
His Gln Ser Ser Ser Leu Pro Phe Thr
1 5

<210> 63
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic

peptide"

<400> 63
Ser Gln Ser Ile Gly Ser Ser
1 5

<210> 64
<211> 3
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 64
Tyr Ala Ser
1

<210> 65
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 65
Ser Ser Ser Leu Pro Phe
1 5

<210> 66
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 66
Gln Ser Ile Gly Ser Ser
1 5

<210> 67

<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 67
Tyr Ala Ser Gln Ser Phe Ser Gly Val Pro
1 5 10

<210> 68
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 68
His Gln Ser Ser Ser Leu Pro Phe Thr
1 5

<210> 69
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 69
Glu Ile Val Leu Thr Gln Ser Pro Asp Phe Gln Ser Val Thr Pro Lys
1 5 10 15

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

Leu His Trp Tyr Gln Gln Lys Pro Asp Gln Ser Pro Lys Leu Leu Ile
35 40 45

Lys Tyr Ala Ser Gln Ser Phe Ser Gly Val Pro Ser Arg Phe Ser Gly

50 55 60

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

Glu Asp Ala Ala Ala Tyr Tyr Cys His Gln Ser Ser Ser Leu Pro Phe
85 90 95

Thr Phe Gly Pro Gly Thr Lys Val Asp Ile Lys
100 105

<210> 70
<211> 321
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polynucleotide"

<400> 70
gagatcgtgc tgacccagtc acccgacttt cagtcagtga cccctaaaga aaaagtgact 60

atcacctgta gggcctccca gtctatcggc tctagcctgc actggtatca gcagaagccc 120

gatcagtcac ctaagctgct gattaagtac gcctctcagt cctttagcgg cgtgccctct 180

aggtttagcg gctcaggctc aggcaccgac ttcaccctga ctatcaatag cctggaagcc 240

gaggacgccg ctgcctacta ctgtcatcag tcaagtagcc tgcccttcac cttcggccct 300

ggcactaaag tggatattaa g 321

<210> 71
<211> 214
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 71
Glu Ile Val Leu Thr Gln Ser Pro Asp Phe Gln Ser Val Thr Pro Lys
1 5 10 15

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

Leu His Trp Tyr Gln Gln Lys Pro Asp Gln Ser Pro Lys Leu Leu Ile
        35                  40                  45

Lys Tyr Ala Ser Gln Ser Phe Ser Gly Val Pro Ser Arg Phe Ser Gly
    50                  55                  60

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

Glu Asp Ala Ala Ala Tyr Tyr Cys His Gln Ser Ser Ser Leu Pro Phe
                85                  90                  95

Thr Phe Gly Pro Gly Thr Lys Val Asp Ile Lys Arg Thr Val Ala Ala
            100                 105                 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
        115                 120                 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
    130                 135                 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145                 150                 155                 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
                165                 170                 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
            180                 185                 190

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
        195                 200                 205

Phe Asn Arg Gly Glu Cys
    210
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<210> 72
<211> 642
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polynucleotide"

<400> 72
gagatcgtgc tgacccagtc acccgacttt cagtcagtga cccctaaaga aaaagtgact 60

atcacctgta gggcctccca gtctatcggc tctagcctgc actggtatca gcagaagccc 120

gatcagtcac ctaagctgct gattaagtac gcctctcagt cctttagcgg cgtgccctct 180

aggtttagcg gctcaggctc aggcaccgac ttcaccctga ctatcaatag cctggaagcc 240

gaggacgccg ctgcctacta ctgtcatcag tcaagtagcc tgcccttcac cttcggccct 300

ggcactaaag tggatattaa gcgtacggtg gccgctccca gcgtgttcat cttccccccc 360

agcgacgagc agctgaagag cggcaccgcc agcgtggtgt gcctgctgaa caacttctac 420

ccccgggagg ccaaggtgca gtggaaggtg gacaacgccc tgcagagcgg caacagccag 480

gagagcgtca ccgagcagga cagcaaggac tccacctaca gcctgagcag caccctgacc 540

ctgagcaagg ccgactacga gaagcataag gtgtacgcct gcgaggtgac ccaccagggc 600

ctgtccagcc ccgtgaccaa gagcttcaac aggggcgagt gc 642

<210> 73
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 73
Gly Gly Thr Phe Lys Ser Tyr Ala Ile Ser
1 5 10

<210> 74
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 74
Asn Ile Ile Pro Met Thr Gly Gln Thr Tyr Tyr Ala Gln Lys Phe Gln
1   5   10   15

Gly

<210> 75
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 75
Ala Ala Tyr His Pro Leu Val Phe Asp Asn
1   5   10

<210> 76
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 76
Ser Tyr Ala Ile Ser
1   5

<210> 77
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic

peptide"

<400> 77
Asn Ile Ile Pro Met Thr Gly Gln Thr Tyr Tyr Ala Gln Lys Phe Gln
1 5 10 15

Gly

<210> 78
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 78
Ala Ala Tyr His Pro Leu Val Phe Asp Asn
1 5 10

<210> 79
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 79
Gly Gly Thr Phe Lys Ser Tyr
1 5

<210> 80
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 80
Ile Pro Met Thr Gly Gln

1 5

<210> 81
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 81
Ala Ala Tyr His Pro Leu Val Phe Asp Asn
1 5 10

<210> 82
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 82
Gly Gly Thr Phe Lys Ser Tyr Ala
1 5

<210> 83
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 83
Ile Ile Pro Met Thr Gly Gln Thr
1 5

<210> 84
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 84
Ala Arg Ala Ala Tyr His Pro Leu Val Phe Asp Asn
1   5   10

<210> 85
<211> 119
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 85
Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
1   5   10   15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Lys Ser Tyr
            20   25   30

Ala Ile Ser Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
        35   40   45

Gly Asn Ile Ile Pro Met Thr Gly Gln Thr Tyr Tyr Ala Gln Lys Phe
    50   55   60

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

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
                85   90   95

Ala Arg Ala Ala Tyr His Pro Leu Val Phe Asp Asn Trp Gly Gln Gly
            100   105   110

Thr Leu Val Thr Val Ser Ser
        115

<210> 86
<211> 357
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polynucleotide"

<400> 86
gaggtgcagc tggtgcagtc aggcgccgaa gtgaagaaac ccggctctag cgtgaaagtc 60

agctgtaaag ctagtggcgg caccttcaag tcctacgcta ttagctgggt cagacaggcc 120

ccaggtcagg gcctggagtg gatgggcaat attatcccta tgaccggtca gacctactac 180

gctcagaaat ttcagggtag agtgactatc accgccgacg agtctactag caccgcctat 240

atggaactgt ctagcctgag atcagaggac accgccgtct actactgcgc tagagccgcc 300

tatcaccccc tggtgttcga taactggggt cagggcaccc tggtcaccgt gtctagc 357

<210> 87
<211> 449
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 87
Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Lys Ser Tyr
20 25 30

Ala Ile Ser Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35 40 45

Gly Asn Ile Ile Pro Met Thr Gly Gln Thr Tyr Tyr Ala Gln Lys Phe
50 55 60

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

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Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
                85                  90                  95

Ala Arg Ala Ala Tyr His Pro Leu Val Phe Asp Asn Trp Gly Gln Gly
            100                 105                 110

Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe
        115                 120                 125

Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu
    130                 135                 140

Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp
145                 150                 155                 160

Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu
                165                 170                 175

Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser
            180                 185                 190

Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro
        195                 200                 205

Ser Asn Thr Lys Val Asp Lys Arg Val Glu Pro Lys Ser Cys Asp Lys
    210                 215                 220

Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro
225                 230                 235                 240

Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser
                245                 250                 255

Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp
            260                 265                 270

Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn
        275                 280                 285
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Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val
    290                 295                 300

Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu
305                 310                 315                 320

Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys
                325                 330                 335

Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr
            340                 345                 350

Leu Pro Pro Cys Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Trp
        355                 360                 365

Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu
    370                 375                 380

Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu
385                 390                 395                 400

Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys
                405                 410                 415

Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu
            420                 425                 430

Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly
        435                 440                 445

Lys
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<210> 88
<211> 1347
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic

polynucleotide"

<400> 88
gaggtgcagc tggtgcagtc aggcgccgaa gtgaagaaac ccggctctag cgtgaaagtc 60

agctgtaaag ctagtggcgg caccttcaag tcctacgcta ttagctgggt cagacaggcc 120

ccaggtcagg gcctggagtg gatgggcaat attatcccta tgaccggtca gacctactac 180

gctcagaaat ttcagggtag agtgactatc accgccgacg agtctactag caccgcctat 240

atggaactgt ctagcctgag atcagaggac accgccgtct actactgcgc tagagccgcc 300

tatcaccccc tggtgttcga taactggggt cagggcaccc tggtcaccgt gtctagcgct 360

agcactaagg gcccctcagt gttccccctg gcccctagct ctaagtctac tagcggcggc 420

accgccgctc tgggctgcct ggtgaaagac tacttccccg agcccgtgac cgtgtcatgg 480

aatagcggcg ctctgactag cggagtgcac accttccccg ccgtgctgca gtctagcggc 540

ctgtatagcc tgtctagcgt ggtgaccgtg cctagctcta gcctgggcac tcagacctac 600

atctgtaacg tgaaccacaa gccctctaac actaaggtgg acaagcgggt ggaacctaag 660

tcctgcgata agactcacac ctgtcccccc tgccctgccc ctgaggctgc cggaggacct 720

agcgtgttcc tgttcccacc taagcctaag gacaccctga tgatctctag gacccccgaa 780

gtgacctgcg tggtggtgga tgtgtctcac gaggaccctg aagtgaagtt caattggtac 840

gtggacggcg tggaagtgca caacgctaag actaagccta gagaggaaca gtataactcc 900

acctatagag tggtgtcagt gctgaccgtg ctgcatcagg actggctgaa cggcaaagag 960

tataagtgta aagtctctaa caaggccctg ccagccccta tcgaaaagac tatctctaag 1020

gctaagggcc agcctagaga acctcaggtg tacaccctgc ccccctgtag agaagagatg 1080

actaagaatc aggtgtccct gtggtgtctg gtgaaaggct tctaccctag cgatatcgcc 1140

gtggaatggg agtctaacgg ccagcccgag aacaactata agactacccc ccctgtgctg 1200

gatagcgacg gctcattctt cctgtactct aagctgaccg tggacaagtc taggtggcag 1260

cagggcaatg tgtttagctg tagcgtgatg cacgaggccc tgcataatca ctacactcag 1320

aagtcactga gcctgagccc cggcaag 1347

<210> 89
<211> 13
<212> PRT

<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 89
Ser Gly Ser Ser Ser Asn Ile Gly Asn His Tyr Val Asn
1 5 10

<210> 90
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 90
Arg Asn Asn His Arg Pro Ser
1 5

<210> 91
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 91
Gln Ser Trp Asp Tyr Ser Gly Phe Ser Thr Val
1 5 10

<210> 92
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 92

Ser Gly Ser Ser Ser Asn Ile Gly Asn His Tyr Val Asn
1   5   10

<210> 93
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      peptide"

<400> 93
Arg Asn Asn His Arg Pro Ser
1   5

<210> 94
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      peptide"

<400> 94
Gln Ser Trp Asp Tyr Ser Gly Phe Ser Thr Val
1   5   10

<210> 95
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      peptide"

<400> 95
Ser Ser Ser Asn Ile Gly Asn His Tyr
1   5

<210> 96
<211> 3
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 96
Arg Asn Asn
1

<210> 97
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 97
Trp Asp Tyr Ser Gly Phe Ser Thr
1 5

<210> 98
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 98
Ser Ser Asn Ile Gly Asn His Tyr
1 5

<210> 99
<211> 3
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 99
Arg Asn Asn

1

<210> 100
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 100
Gln Ser Trp Asp Tyr Ser Gly Phe Ser Thr Val
1 5 10

<210> 101
<211> 110
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 101
Asp Ile Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn His
20 25 30

Tyr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Arg Asn Asn His Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Trp Asp Tyr Ser Gly
85 90 95

Phe Ser Thr Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

<210> 102
<211> 330
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polynucleotide"

<400> 102
gatatcgtcc tgactcagcc ccctagcgtc agcggcgctc ccggtcagag agtgactatt 60

agctgtagcg gctctagctc taatatcggt aatcactacg tgaactggta tcagcagctg 120

cccggcaccg cccctaagct gctgatctat agaaacaatc accggcctag cggcgtgccc 180

gataggttta gcggatctaa gtcaggcact agcgctagtc tggctatcac cggactgcag 240

tcagaggacg aggccgacta ctactgtcag tcctgggact atagcggctt tagcaccgtg 300

ttcggcggag gcactaagct gaccgtgctg 330

<210> 103
<211> 216
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 103
Asp Ile Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn His
20 25 30

Tyr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Arg Asn Asn His Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

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Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu Gln
65                  70                  75                  80


Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Trp Asp Tyr Ser Gly
                85                  90                  95


Phe Ser Thr Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Gln
            100                 105                 110


Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu
        115                 120                 125


Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr
    130                 135                 140


Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys
145                 150                 155                 160


Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr
                165                 170                 175


Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His
            180                 185                 190


Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu Lys
        195                 200                 205


Thr Val Ala Pro Thr Glu Cys Ser
    210                 215


<210> 104
<211> 648
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polynucleotide"

<400> 104
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agctgtagcg gctctagctc taatatcggt aatcactacg tgaactggta tcagcagctg 120

cccggcaccg cccctaagct gctgatctat agaaacaatc accggcctag cggcgtgccc 180

gataggttta gcggatctaa gtcaggcact agcgctagtc tggctatcac cggactgcag 240

tcagaggacg aggccgacta ctactgtcag tcctgggact atagcggctt tagcaccgtg 300

ttcggcggag gcactaagct gaccgtgctg ggtcagccta aggctgcccc cagcgtgacc 360

ctgttccccc ccagcagcga ggagctgcag gccaacaagg ccaccctggt gtgcctgatc 420

agcgacttct acccaggcgc cgtgaccgtg gcctggaagg ccgacagcag ccccgtgaag 480

gccggcgtgg agaccaccac ccccagcaag cagagcaaca acaagtacgc cgccagcagc 540

tacctgagcc tgacccccga gcagtggaag agccacaggt cctacagctg ccaggtgacc 600

cacgagggca gcaccgtgga aaagaccgtg gccccaaccg agtgcagc 648