SEQUENCE LISTING

<110> Aurealis Oy

<120> Recombinant probiotic bacteria

<130> 52647WON1

<150> PCT/EP2015/052345
<151> 2015-02-04

<160> 83

<170> BiSSAP 1.0

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<212> PRT
<213> Homo sapiens

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/organism="Homo sapiens"

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1 5 10 15
Gly Ser Leu Leu Leu Leu Val Cys Leu Leu Ala Ser Arg Ser Ile Thr
20 25 30
Glu Glu Val Ser Glu Tyr Cys Ser His Met Ile Gly Ser Gly His Leu
35 40 45
Gln Ser Leu Gln Arg Leu Ile Asp Ser Gln Met Glu Thr Ser Cys Gln
50 55 60
Ile Thr Phe Glu Phe Val Asp Gln Glu Gln Leu Lys Asp Pro Val Cys
65 70 75 80
Tyr Leu Lys Lys Ala Phe Leu Leu Val Gln Asp Ile Met Glu Asp Thr
85 90 95
Met Arg Phe Arg Asp Asn Thr Pro Asn Ala Ile Ala Ile Val Gln Leu
100 105 110
Gln Glu Leu Ser Leu Arg Leu Lys Ser Cys Phe Thr Lys Asp Tyr Glu
115 120 125
Glu His Asp Lys Ala Cys Val Arg Thr Phe Tyr Glu Thr Pro Leu Gln
130 135 140
Leu Leu Glu Lys Val Lys Asn Val Phe Asn Glu Thr Lys Asn Leu Leu

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145                 150                 155                 160
Asp Lys Asp Trp Asn Ile Phe Ser Lys Asn Cys Asn Asn Ser Phe Ala
                165                 170                 175
Glu Cys Ser Ser Gln Asp Val Val Thr Lys Pro Asp Cys Asn Cys Leu
            180                 185                 190
Tyr Pro Lys Ala Ile Pro Ser Ser Asp Pro Ala Ser Val Ser Pro His
        195                 200                 205
Gln Pro Leu Ala Pro Ser Met Ala Pro Val Ala Gly Leu Thr Trp Glu
    210                 215                 220
Asp Ser Glu Gly Thr Glu Gly Ser Ser Leu Leu Pro Gly Glu Gln Pro
225                 230                 235                 240
Leu His Thr Val Asp Pro Gly Ser Ala Lys Gln Arg Pro Pro Arg Ser
                245                 250                 255
Thr Cys Gln Ser Phe Glu Pro Pro Glu Thr Pro Val Val Lys Asp Ser
            260                 265                 270
Thr Ile Gly Gly Ser Pro Gln Pro Arg Pro Ser Val Gly Ala Phe Asn
        275                 280                 285
Pro Gly Met Glu Asp Ile Leu Asp Ser Ala Met Gly Thr Asn Trp Val
    290                 295                 300
Pro Glu Glu Ala Ser Gly Glu Ala Ser Glu Ile Pro Val Pro Gln Gly
305                 310                 315                 320
Thr Glu Leu Ser Pro Ser Arg Pro Gly Gly Gly Ser Met Gln Thr Glu
                325                 330                 335
Pro Ala Arg Pro Ser Asn Phe Leu Ser Ala Ser Ser Pro Leu Pro Ala
            340                 345                 350
Ser Ala Lys Gly Gln Gln Pro Ala Asp Val Thr Gly Thr Ala Leu Pro
        355                 360                 365
Arg Val Gly Pro Val Arg Pro Thr Gly Gln Asp Trp Asn His Thr Pro
    370                 375                 380
Gln Lys Thr Asp His Pro Ser Ala Leu Leu Arg Asp Pro Pro Glu Pro
385                 390                 395                 400
Gly Ser Pro Arg Ile Ser Ser Leu Arg Pro Gln Gly Leu Ser Asn Pro
                405                 410                 415
Ser Thr Leu Ser Ala Gln Pro Gln Leu Ser Arg Ser His Ser Ser Gly
            420                 425                 430
Ser Val Leu Pro Leu Gly Glu Leu Glu Gly Arg Arg Ser Thr Arg Asp
        435                 440                 445
Arg Arg Ser Pro Ala Glu Pro Glu Gly Gly Pro Ala Ser Glu Gly Ala
    450                 455                 460
Ala Arg Pro Leu Pro Arg Phe Asn Ser Val Pro Leu Thr Asp Thr Gly
465                 470                 475                 480
His Glu Arg Gln Ser Glu Gly Ser Ser Ser Pro Gln Leu Gln Glu Ser
                485                 490                 495
Val Phe His Leu Leu Val Pro Ser Val Ile Leu Val Leu Leu Ala Val
            500                 505                 510
Gly Gly Leu Leu Phe Tyr Arg Trp Arg Arg Arg Ser His Gln Glu Pro
        515                 520                 525
Gln Arg Ala Asp Ser Pro Leu Glu Gln Pro Glu Gly Ser Pro Leu Thr
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Gln Asp Asp Arg Gln Val Glu Leu Pro Val
545                 550
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<210> 2
<211> 438
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<213> Homo sapiens

<220>
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/organism="Homo sapiens"

<400> 2

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1               5                  10                  15
Gly Ser Leu Leu Leu Leu Val Cys Leu Leu Ala Ser Arg Ser Ile Thr
            20                  25                  30
Glu Glu Val Ser Glu Tyr Cys Ser His Met Ile Gly Ser Gly His Leu
        35                  40                  45
Gln Ser Leu Gln Arg Leu Ile Asp Ser Gln Met Glu Thr Ser Cys Gln
    50                  55                  60
Ile Thr Phe Glu Phe Val Asp Gln Glu Gln Leu Lys Asp Pro Val Cys
65                  70                  75                  80
Tyr Leu Lys Lys Ala Phe Leu Leu Val Gln Asp Ile Met Glu Asp Thr
                85                  90                  95
Met Arg Phe Arg Asp Asn Thr Pro Asn Ala Ile Ala Ile Val Gln Leu
            100                 105                 110
Gln Glu Leu Ser Leu Arg Leu Lys Ser Cys Phe Thr Lys Asp Tyr Glu
        115                 120                 125
Glu His Asp Lys Ala Cys Val Arg Thr Phe Tyr Glu Thr Pro Leu Gln
    130                 135                 140
Leu Leu Glu Lys Val Lys Asn Val Phe Asn Glu Thr Lys Asn Leu Leu
145                 150                 155                 160
Asp Lys Asp Trp Asn Ile Phe Ser Lys Asn Cys Asn Asn Ser Phe Ala
                165                 170                 175
Glu Cys Ser Ser Gln Asp Val Val Thr Lys Pro Asp Cys Asn Cys Leu
            180                 185                 190
Tyr Pro Lys Ala Ile Pro Ser Ser Asp Pro Ala Ser Val Ser Pro His
        195                 200                 205
Gln Pro Leu Ala Pro Ser Met Ala Pro Val Ala Gly Leu Thr Trp Glu
    210                 215                 220
Asp Ser Glu Gly Thr Glu Gly Ser Ser Leu Leu Pro Gly Glu Gln Pro
225                 230                 235                 240
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Leu His Thr Val Asp Pro Gly Ser Ala Lys Gln Arg Pro Pro Arg Ser
                245                 250                 255
Thr Cys Gln Ser Phe Glu Pro Pro Glu Thr Pro Val Val Lys Asp Ser
            260                 265                 270
Thr Ile Gly Gly Ser Pro Gln Pro Arg Pro Ser Val Gly Ala Phe Asn
        275                 280                 285
Pro Gly Met Glu Asp Ile Leu Asp Ser Ala Met Gly Thr Asn Trp Val
    290                 295                 300
Pro Glu Glu Ala Ser Gly Glu Ala Ser Glu Ile Pro Val Pro Gln Gly
305                 310                 315                 320
Thr Glu Leu Ser Pro Ser Arg Pro Gly Gly Gly Ser Met Gln Thr Glu
                325                 330                 335
Pro Ala Arg Pro Ser Asn Phe Leu Ser Ala Ser Ser Pro Leu Pro Ala
            340                 345                 350
Ser Ala Lys Gly Gln Gln Pro Ala Asp Val Thr Gly His Glu Arg Gln
        355                 360                 365
Ser Glu Gly Ser Ser Ser Pro Gln Leu Gln Glu Ser Val Phe His Leu
    370                 375                 380
Leu Val Pro Ser Val Ile Leu Val Leu Leu Ala Val Gly Gly Leu Leu
385                 390                 395                 400
Phe Tyr Arg Trp Arg Arg Arg Ser His Gln Glu Pro Gln Arg Ala Asp
                405                 410                 415
Ser Pro Leu Glu Gln Pro Glu Gly Ser Pro Leu Thr Gln Asp Asp Arg
            420                 425                 430
Gln Val Glu Leu Pro Val
        435
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<210> 3
<211> 256
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
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<223> /mol_type="protein"
/note="macrophage colony-stimulating factor 1 isoform c precursor
"
/organism="Homo sapiens"

<400> 3

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Met Thr Ala Pro Gly Ala Ala Gly Arg Cys Pro Pro Thr Thr Trp Leu
1               5                   10                  15
Gly Ser Leu Leu Leu Leu Val Cys Leu Leu Ala Ser Arg Ser Ile Thr
            20                  25                  30
Glu Glu Val Ser Glu Tyr Cys Ser His Met Ile Gly Ser Gly His Leu
        35                  40                  45
Gln Ser Leu Gln Arg Leu Ile Asp Ser Gln Met Glu Thr Ser Cys Gln
```

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

<210> 4
<211> 149
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..149
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      /note="partial sequence of macrophage colony-stimulating factor 1
      "
      /organism="Homo sapiens"

<400> 4
Glu Glu Val Ser Glu Tyr Cys Ser His Met Ile Gly Ser Gly His Leu
1               5                   10                  15
Gln Ser Leu Gln Arg Leu Ile Asp Ser Gln Met Glu Thr Ser Cys Gln
            20                  25                  30
Ile Thr Phe Glu Phe Val Asp Gln Glu Gln Leu Lys Asp Pro Val Cys
        35                  40                  45
Tyr Leu Lys Lys Ala Phe Leu Leu Val Gln Asp Ile Met Glu Asp Thr
    50                  55                  60
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Met Arg Phe Arg Asp Asn Thr Pro Asn Ala Ile Ala Ile Val Gln Leu
65                  70                  75                  80
Gln Glu Leu Ser Leu Arg Leu Lys Ser Cys Phe Thr Lys Asp Tyr Glu
                85                  90                  95
Glu His Asp Lys Ala Cys Val Arg Thr Phe Tyr Glu Thr Pro Leu Gln
            100                 105                 110
Leu Leu Glu Lys Val Lys Asn Val Phe Asn Glu Thr Lys Asn Leu Leu
        115                 120                 125
Asp Lys Asp Trp Asn Ile Phe Ser Lys Asn Cys Asn Asn Ser Phe Ala
    130                 135                 140
Glu Cys Ser Ser Gln
145
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<210> 5
<211> 186
<212> PRT
<213> artificial sequences

<220>
<221> SOURCE
<222> 1..186
<223> /mol_type="protein"
/note="synthetic construct hCSF1 precursor protein"
/organism="artificial sequences"

<400> 5

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Met Lys Lys Lys Ile Ile Ser Ala Ile Leu Met Ser Thr Val Ile Leu
1               5                   10                  15
Ser Ala Ala Ala Pro Leu Ser Gly Val Tyr Ala Ala Glu Glu Val Ser
            20                  25                  30
Glu Tyr Cys Ser His Met Ile Gly Ser Gly His Leu Gln Ser Leu Gln
        35                  40                  45
Arg Leu Ile Asp Ser Gln Met Glu Thr Ser Cys Gln Ile Thr Phe Glu
    50                  55                  60
Phe Val Asp Gln Glu Gln Leu Lys Asp Pro Val Cys Tyr Leu Lys Lys
65                  70                  75                  80
Ala Phe Leu Leu Val Gln Asp Ile Met Glu Asp Thr Met Arg Phe Arg
                85                  90                  95
Asp Asn Thr Pro Asn Ala Ile Ala Ile Val Gln Leu Gln Glu Leu Ser
            100                 105                 110
Leu Arg Leu Lys Ser Cys Phe Thr Lys Asp Tyr Glu Glu His Asp Lys
        115                 120                 125
Ala Cys Val Arg Thr Phe Tyr Glu Thr Pro Leu Gln Leu Leu Glu Lys
    130                 135                 140
Val Lys Asn Val Phe Asn Glu Thr Lys Asn Leu Leu Asp Lys Asp Trp
145                 150                 155                 160
Asn Ile Phe Ser Lys Asn Cys Asn Asn Ser Phe Ala Glu Cys Ser Ser
                165                 170                 175
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Gln Gly His Glu Arg Gln Ser Glu Gly Ser
            180                 185

<210> 6
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<220>
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<222> 1..159
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      /organism="artificial sequences"

<400> 6
Ala Glu Glu Val Ser Glu Tyr Cys Ser His Met Ile Gly Ser Gly His
1               5                  10                  15
Leu Gln Ser Leu Gln Arg Leu Ile Asp Ser Gln Met Glu Thr Ser Cys
            20                  25                  30
Gln Ile Thr Phe Glu Phe Val Asp Gln Glu Gln Leu Lys Asp Pro Val
        35                  40                  45
Cys Tyr Leu Lys Lys Ala Phe Leu Leu Val Gln Asp Ile Met Glu Asp
    50                  55                  60
Thr Met Arg Phe Arg Asp Asn Thr Pro Asn Ala Ile Ala Ile Val Gln
65                  70                  75                  80
Leu Gln Glu Leu Ser Leu Arg Leu Lys Ser Cys Phe Thr Lys Asp Tyr
                85                  90                  95
Glu Glu His Asp Lys Ala Cys Val Arg Thr Phe Tyr Glu Thr Pro Leu
            100                 105                 110
Gln Leu Leu Glu Lys Val Lys Asn Val Phe Asn Glu Thr Lys Asn Leu
        115                 120                 125
Leu Asp Lys Asp Trp Asn Ile Phe Ser Lys Asn Cys Asn Asn Ser Phe
    130                 135                 140
Ala Glu Cys Ser Ser Gln Gly His Glu Arg Gln Ser Glu Gly Ser
145                 150                 155

<210> 7
<211> 242
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..242
<223> /mol_type="protein"
      /note="interleukin-34 isoform 1 precursor"
      /organism="Homo sapiens"
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<400> 7
Met Pro Arg Gly Phe Thr Trp Leu Arg Tyr Leu Gly Ile Phe Leu Gly
1   5   10   15
Val Ala Leu Gly Asn Glu Pro Leu Glu Met Trp Pro Leu Thr Gln Asn
            20   25   30
Glu Glu Cys Thr Val Thr Gly Phe Leu Arg Asp Lys Leu Gln Tyr Arg
        35   40   45
Ser Arg Leu Gln Tyr Met Lys His Tyr Phe Pro Ile Asn Tyr Lys Ile
    50   55   60
Ser Val Pro Tyr Glu Gly Val Phe Arg Ile Ala Asn Val Thr Arg Leu
65   70   75   80
Gln Arg Ala Gln Val Ser Glu Arg Glu Leu Arg Tyr Leu Trp Val Leu
                85   90   95
Val Ser Leu Ser Ala Thr Glu Ser Val Gln Asp Val Leu Leu Glu Gly
            100   105   110
His Pro Ser Trp Lys Tyr Leu Gln Glu Val Glu Thr Leu Leu Leu Asn
        115   120   125
Val Gln Gln Gly Leu Thr Asp Val Glu Val Ser Pro Lys Val Glu Ser
    130   135   140
Val Leu Ser Leu Leu Asn Ala Pro Gly Pro Asn Leu Lys Leu Val Arg
145   150   155   160
Pro Lys Ala Leu Leu Asp Asn Cys Phe Arg Val Met Glu Leu Leu Tyr
                165   170   175
Cys Ser Cys Cys Lys Gln Ser Ser Val Leu Asn Trp Gln Asp Cys Glu
            180   185   190
Val Pro Ser Pro Gln Ser Cys Ser Pro Glu Pro Ser Leu Gln Tyr Ala
        195   200   205
Ala Thr Gln Leu Tyr Pro Pro Pro Pro Trp Ser Pro Ser Ser Pro Pro
    210   215   220
His Ser Thr Gly Ser Val Arg Pro Val Arg Ala Gln Gly Glu Gly Leu
225   230   235   240
Leu Pro

<210> 8
<211> 241
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..241
<223> /mol_type="protein"
      /note="interleukin-34 isoform 2 precursor"
      /organism="Homo sapiens"

<400> 8

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1               5                  10                  15
Val Ala Leu Gly Asn Glu Pro Leu Glu Met Trp Pro Leu Thr Gln Asn
            20                  25                  30
Glu Glu Cys Thr Val Thr Gly Phe Leu Arg Asp Lys Leu Gln Tyr Arg
        35                  40                  45
Ser Arg Leu Gln Tyr Met Lys His Tyr Phe Pro Ile Asn Tyr Lys Ile
    50                  55                  60
Ser Val Pro Tyr Glu Gly Val Phe Arg Ile Ala Asn Val Thr Arg Leu
65                  70                  75                  80
Arg Ala Gln Val Ser Glu Arg Glu Leu Arg Tyr Leu Trp Val Leu Val
                85                  90                  95
Ser Leu Ser Ala Thr Glu Ser Val Gln Asp Val Leu Leu Glu Gly His
            100                 105                 110
Pro Ser Trp Lys Tyr Leu Gln Glu Val Glu Thr Leu Leu Leu Asn Val
        115                 120                 125
Gln Gln Gly Leu Thr Asp Val Glu Val Ser Pro Lys Val Glu Ser Val
    130                 135                 140
Leu Ser Leu Leu Asn Ala Pro Gly Pro Asn Leu Lys Leu Val Arg Pro
145                 150                 155                 160
Lys Ala Leu Leu Asp Asn Cys Phe Arg Val Met Glu Leu Leu Tyr Cys
                165                 170                 175
Ser Cys Cys Lys Gln Ser Ser Val Leu Asn Trp Gln Asp Cys Glu Val
            180                 185                 190
Pro Ser Pro Gln Ser Cys Ser Pro Glu Pro Ser Leu Gln Tyr Ala Ala
        195                 200                 205
Thr Gln Leu Tyr Pro Pro Pro Pro Trp Ser Pro Ser Ser Pro Pro His
    210                 215                 220
Ser Thr Gly Ser Val Arg Pro Val Arg Ala Gln Gly Glu Gly Leu Leu
225                 230                 235                 240
Pro
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<210> 9
<211> 222
<212> PRT
<213> Homo sapiens

<220>
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/organism="Homo sapiens"

<400> 9

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Asn Glu Pro Leu Glu Met Trp Pro Leu Thr Gln Asn Glu Glu Cys Thr
1               5                  10                  15
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Val Thr Gly Phe Leu Arg Asp Lys Leu Gln Tyr Arg Ser Arg Leu Gln
            20                  25                  30
Tyr Met Lys His Tyr Phe Pro Ile Asn Tyr Lys Ile Ser Val Pro Tyr
        35                  40                  45
Glu Gly Val Phe Arg Ile Ala Asn Val Thr Arg Leu Gln Arg Ala Gln
    50                  55                  60
Val Ser Glu Arg Glu Leu Arg Tyr Leu Trp Val Leu Val Ser Leu Ser
65                  70                  75                  80
Ala Thr Glu Ser Val Gln Asp Val Leu Leu Glu Gly His Pro Ser Trp
                85                  90                  95
Lys Tyr Leu Gln Glu Val Glu Thr Leu Leu Leu Asn Val Gln Gln Gly
            100                 105                 110
Leu Thr Asp Val Glu Val Ser Pro Lys Val Glu Ser Val Leu Ser Leu
        115                 120                 125
Leu Asn Ala Pro Gly Pro Asn Leu Lys Leu Val Arg Pro Lys Ala Leu
    130                 135                 140
Leu Asp Asn Cys Phe Arg Val Met Glu Leu Leu Tyr Cys Ser Cys Cys
145                 150                 155                 160
Lys Gln Ser Ser Val Leu Asn Trp Gln Asp Cys Glu Val Pro Ser Pro
                165                 170                 175
Gln Ser Cys Ser Pro Glu Pro Ser Leu Gln Tyr Ala Ala Thr Gln Leu
            180                 185                 190
Tyr Pro Pro Pro Pro Trp Ser Pro Ser Ser Pro Pro His Ser Thr Gly
        195                 200                 205
Ser Val Arg Pro Val Arg Ala Gln Gly Glu Gly Leu Leu Pro
    210                 215                 220

<210> 10
<211> 153
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..153
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      /organism="Homo sapiens"

<400> 10
Met Gly Leu Thr Ser Gln Leu Leu Pro Pro Leu Phe Phe Leu Leu Ala
1               5                   10                  15
Cys Ala Gly Asn Phe Val His Gly His Lys Cys Asp Ile Thr Leu Gln
            20                  25                  30
Glu Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu Gln Lys Thr Leu Cys
        35                  40                  45
Thr Glu Leu Thr Val Thr Asp Ile Phe Ala Ala Ser Lys Asn Thr Thr
    50                  55                  60
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```
Glu Lys Glu Thr Phe Cys Arg Ala Ala Thr Val Leu Arg Gln Phe Tyr
65                  70                  75                  80
Ser His His Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr Ala Gln Gln
                85                  90                  95
Phe His Arg His Lys Gln Leu Ile Arg Phe Leu Lys Arg Leu Asp Arg
            100                 105                 110
Asn Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys Pro Val Lys Glu Ala
        115                 120                 125
Asn Gln Ser Thr Leu Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile Met
    130                 135                 140
Arg Glu Lys Tyr Ser Lys Cys Ser Ser
145                 150

<210> 11
<211> 137
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..137
<223> /mol_type="protein"
      /note="interleukin-4 isoform 2 precursor"
      /organism="Homo sapiens"

<400> 11
Met Gly Leu Thr Ser Gln Leu Leu Pro Pro Leu Phe Phe Leu Leu Ala
1               5                   10                  15
Cys Ala Gly Asn Phe Val His Gly His Lys Cys Asp Ile Thr Leu Gln
            20                  25                  30
Glu Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu Gln Lys Asn Thr Thr
        35                  40                  45
Glu Lys Glu Thr Phe Cys Arg Ala Ala Thr Val Leu Arg Gln Phe Tyr
    50                  55                  60
Ser His His Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr Ala Gln Gln
65                  70                  75                  80
Phe His Arg His Lys Gln Leu Ile Arg Phe Leu Lys Arg Leu Asp Arg
                85                  90                  95
Asn Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys Pro Val Lys Glu Ala
            100                 105                 110
Asn Gln Ser Thr Leu Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile Met
        115                 120                 125
Arg Glu Lys Tyr Ser Lys Cys Ser Ser
    130                 135

<210> 12
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<212> PRT
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<213> Homo sapiens

<220>
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<223> /mol_type="protein"
/note="interleukin-4"
/organism="Homo sapiens"

<400> 12
His Lys Cys Asp Ile Thr Leu Gln Glu Ile Ile Lys Thr Leu Asn Ser
1 5 10 15
Leu Thr Glu Gln Lys Thr Leu Cys Thr Glu Leu Thr Val Thr Asp Ile
20 25 30
Phe Ala Ala Ser Lys Asn Thr Thr Glu Lys Glu Thr Phe Cys Arg Ala
35 40 45
Ala Thr Val Leu Arg Gln Phe Tyr Ser His His Glu Lys Asp Thr Arg
50 55 60
Cys Leu Gly Ala Thr Ala Gln Gln Phe His Arg His Lys Gln Leu Ile
65 70 75 80
Arg Phe Leu Lys Arg Leu Asp Arg Asn Leu Trp Gly Leu Ala Gly Leu
85 90 95
Asn Ser Cys Pro Val Lys Glu Ala Asn Gln Ser Thr Leu Glu Asn Phe
100 105 110
Leu Glu Arg Leu Lys Thr Ile Met Arg Glu Lys Tyr Ser Lys Cys Ser
115 120 125
Ser

<210> 13
<211> 157
<212> PRT
<213> artificial sequences

<220>
<221> SOURCE
<222> 1..157
<223> /mol_type="protein"
/note="synthetic construct hIL4 precursor protein"
/organism="artificial sequences"

<400> 13
Met Lys Lys Lys Ile Ile Ser Ala Ile Leu Met Ser Thr Val Ile Leu
1 5 10 15
Ser Ala Ala Ala Pro Leu Ser Gly Val Tyr Ala Ala His Lys Cys Asp
20 25 30
Ile Thr Leu Gln Glu Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu Gln
35 40 45

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```
Lys Thr Leu Cys Thr Glu Leu Thr Val Thr Asp Ile Phe Ala Ala Ser
    50                  55                  60
Lys Asn Thr Thr Glu Lys Glu Thr Phe Cys Arg Ala Ala Thr Val Leu
65                  70                  75                  80
Arg Gln Phe Tyr Ser His His Glu Lys Asp Thr Arg Cys Leu Gly Ala
                85                  90                  95
Thr Ala Gln Gln Phe His Arg His Lys Gln Leu Ile Arg Phe Leu Lys
            100                 105                 110
Arg Leu Asp Arg Asn Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys Pro
        115                 120                 125
Val Lys Glu Ala Asn Gln Ser Thr Leu Glu Asn Phe Leu Glu Arg Leu
    130                 135                 140
Lys Thr Ile Met Arg Glu Lys Tyr Ser Lys Cys Ser Ser
145                 150                 155
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<210> 14
<211> 130
<212> PRT
<213> artificial sequences

<220>
<221> SOURCE
<222> 1..130
<223> /mol_type="protein"
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      /organism="artificial sequences"

<400> 14

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Ala His Lys Cys Asp Ile Thr Leu Gln Glu Ile Ile Lys Thr Leu Asn
1               5                   10                  15
Ser Leu Thr Glu Gln Lys Thr Leu Cys Thr Glu Leu Thr Val Thr Asp
            20                  25                  30
Ile Phe Ala Ala Ser Lys Asn Thr Thr Glu Lys Glu Thr Phe Cys Arg
        35                  40                  45
Ala Ala Thr Val Leu Arg Gln Phe Tyr Ser His His Glu Lys Asp Thr
    50                  55                  60
Arg Cys Leu Gly Ala Thr Ala Gln Gln Phe His Arg His Lys Gln Leu
65                  70                  75                  80
Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn Leu Trp Gly Leu Ala Gly
                85                  90                  95
Leu Asn Ser Cys Pro Val Lys Glu Ala Asn Gln Ser Thr Leu Glu Asn
            100                 105                 110
Phe Leu Glu Arg Leu Lys Thr Ile Met Arg Glu Lys Tyr Ser Lys Cys
        115                 120                 125
Ser Ser
    130
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<210> 15

<211> 178
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..178
<223> /mol_type="protein"
/note="interleukin-10 precursor"
/organism="Homo sapiens"

<400> 15
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Met His Ser Ser Ala Leu Leu Cys Cys Leu Val Leu Leu Thr Gly Val
1               5                  10                  15
Arg Ala Ser Pro Gly Gln Gly Thr Gln Ser Glu Asn Ser Cys Thr His
            20                  25                  30
Phe Pro Gly Asn Leu Pro Asn Met Leu Arg Asp Leu Arg Asp Ala Phe
        35                  40                  45
Ser Arg Val Lys Thr Phe Phe Gln Met Lys Asp Gln Leu Asp Asn Leu
    50                  55                  60
Leu Leu Lys Glu Ser Leu Leu Glu Asp Phe Lys Gly Tyr Leu Gly Cys
65                  70                  75                  80
Gln Ala Leu Ser Glu Met Ile Gln Phe Tyr Leu Glu Glu Val Met Pro
                85                  90                  95
Gln Ala Glu Asn Gln Asp Pro Asp Ile Lys Ala His Val Asn Ser Leu
            100                 105                 110
Gly Glu Asn Leu Lys Thr Leu Arg Leu Arg Leu Arg Arg Cys His Arg
        115                 120                 125
Phe Leu Pro Cys Glu Asn Lys Ser Lys Ala Val Glu Gln Val Lys Asn
    130                 135                 140
Ala Phe Asn Lys Leu Gln Glu Lys Gly Ile Tyr Lys Ala Met Ser Glu
145                 150                 155                 160
Phe Asp Ile Phe Ile Asn Tyr Ile Glu Ala Tyr Met Thr Met Lys Ile
                165                 170                 175
Arg Asn
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<210> 16
<211> 160
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..160
<223> /mol_type="protein"
/note="interleukin-10"
/organism="Homo sapiens"

<400> 16
Ser Pro Gly Gln Gly Thr Gln Ser Glu Asn Ser Cys Thr His Phe Pro
1   5   10   15
Gly Asn Leu Pro Asn Met Leu Arg Asp Leu Arg Asp Ala Phe Ser Arg
            20   25   30
Val Lys Thr Phe Phe Gln Met Lys Asp Gln Leu Asp Asn Leu Leu Leu
        35   40   45
Lys Glu Ser Leu Leu Glu Asp Phe Lys Gly Tyr Leu Gly Cys Gln Ala
    50   55   60
Leu Ser Glu Met Ile Gln Phe Tyr Leu Glu Glu Val Met Pro Gln Ala
65   70   75   80
Glu Asn Gln Asp Pro Asp Ile Lys Ala His Val Asn Ser Leu Gly Glu
                85   90   95
Asn Leu Lys Thr Leu Arg Leu Arg Leu Arg Arg Cys His Arg Phe Leu
            100   105   110
Pro Cys Glu Asn Lys Ser Lys Ala Val Glu Gln Val Lys Asn Ala Phe
        115   120   125
Asn Lys Leu Gln Glu Lys Gly Ile Tyr Lys Ala Met Ser Glu Phe Asp
    130   135   140
Ile Phe Ile Asn Tyr Ile Glu Ala Tyr Met Thr Met Lys Ile Arg Asn
145   150   155   160

<210> 17
<211> 146
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..146
<223> /mol_type="protein"
      /note="interleukin-13 precursor"
      /organism="Homo sapiens"

<400> 17
Met His Pro Leu Leu Asn Pro Leu Leu Leu Ala Leu Gly Leu Met Ala
1   5   10   15
Leu Leu Leu Thr Thr Val Ile Ala Leu Thr Cys Leu Gly Gly Phe Ala
            20   25   30
Ser Pro Gly Pro Val Pro Pro Ser Thr Ala Leu Arg Glu Leu Ile Glu
        35   40   45
Glu Leu Val Asn Ile Thr Gln Asn Gln Lys Ala Pro Leu Cys Asn Gly
    50   55   60
Ser Met Val Trp Ser Ile Asn Leu Thr Ala Gly Met Tyr Cys Ala Ala
65   70   75   80
Leu Glu Ser Leu Ile Asn Val Ser Gly Cys Ser Ala Ile Glu Lys Thr
                85   90   95

```
Gln Arg Met Leu Ser Gly Phe Cys Pro His Lys Val Ser Ala Gly Gln
            100                 105                 110
Phe Ser Ser Leu His Val Arg Asp Thr Lys Ile Glu Val Ala Gln Phe
        115                 120                 125
Val Lys Asp Leu Leu Leu His Leu Lys Lys Leu Phe Arg Glu Gly Arg
    130                 135                 140
Phe Asn
145

<210> 18
<211> 112
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..112
<223> /mol_type="protein"
      /note="interleukin-13"
      /organism="Homo sapiens"

<400> 18
Gly Pro Val Pro Pro Ser Thr Ala Leu Arg Glu Leu Ile Glu Glu Leu
1               5                   10                  15
Val Asn Ile Thr Gln Asn Gln Lys Ala Pro Leu Cys Asn Gly Ser Met
            20                  25                  30
Val Trp Ser Ile Asn Leu Thr Ala Gly Met Tyr Cys Ala Ala Leu Glu
        35                  40                  45
Ser Leu Ile Asn Val Ser Gly Cys Ser Ala Ile Glu Lys Thr Gln Arg
    50                  55                  60
Met Leu Ser Gly Phe Cys Pro His Lys Val Ser Ala Gly Gln Phe Ser
65                  70                  75                  80
Ser Leu His Val Arg Asp Thr Lys Ile Glu Val Ala Gln Phe Val Lys
                85                  90                  95
Asp Leu Leu Leu His Leu Lys Lys Leu Phe Arg Glu Gly Arg Phe Asn
            100                 105                 110

<210> 19
<211> 390
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..390
<223> /mol_type="protein"
      /note="transforming growth factor beta-1 precursor"
      /organism="Homo sapiens"
```

<400> 19
```
Met Pro Pro Ser Gly Leu Arg Leu Leu Pro Leu Leu Leu Pro Leu Leu
1               5                  10                  15
Trp Leu Leu Val Leu Thr Pro Gly Arg Pro Ala Ala Gly Leu Ser Thr
            20                  25                  30
Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg Ile Glu Ala
        35                  40                  45
Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser Pro Pro Ser
    50                  55                  60
Gln Gly Glu Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu
65                  70                  75                  80
Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Ala Glu Pro Glu
                85                  90                  95
Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu
            100                 105                 110
Met Val Glu Thr His Asn Glu Ile Tyr Asp Lys Phe Lys Gln Ser Thr
        115                 120                 125
His Ser Ile Tyr Met Phe Phe Asn Thr Ser Glu Leu Arg Glu Ala Val
    130                 135                 140
Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu Leu Arg Leu
145                 150                 155                 160
Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys Tyr Ser Asn
                165                 170                 175
Asn Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro Ser Asp Ser
            180                 185                 190
Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg Gln Trp Leu
        195                 200                 205
Ser Arg Gly Gly Glu Ile Glu Gly Phe Arg Leu Ser Ala His Cys Ser
    210                 215                 220
Cys Asp Ser Arg Asp Asn Thr Leu Gln Val Asp Ile Asn Gly Phe Thr
225                 230                 235                 240
Thr Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly Met Asn Arg Pro
                245                 250                 255
Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu Gln
            260                 265                 270
Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Tyr Cys Phe Ser Ser
        275                 280                 285
Thr Glu Lys Asn Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys
    290                 295                 300
Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala Asn
305                 310                 315                 320
Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr
                325                 330                 335
Ser Lys Val Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala
            340                 345                 350
Ala Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr
        355                 360                 365
```

```
Tyr Val Gly Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile Val
    370                 375                 380
Arg Ser Cys Lys Cys Ser
385                 390

<210> 20
<211> 112
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..112
<223> /mol_type="protein"
      /note="transforming growth factor beta-1"
      /organism="Homo sapiens"

<400> 20
Ala Leu Asp Thr Asn Tyr Cys Phe Ser Ser Thr Glu Lys Asn Cys Cys
1               5                   10                  15
Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gly Trp Lys Trp
            20                  25                  30
Ile His Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu Gly Pro Cys
        35                  40                  45
Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr Ser Lys Val Leu Ala Leu
    50                  55                  60
Tyr Asn Gln His Asn Pro Gly Ala Ser Ala Ala Pro Cys Cys Val Pro
65                  70                  75                  80
Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr Tyr Val Gly Arg Lys Pro
                85                  90                  95
Lys Val Glu Gln Leu Ser Asn Met Ile Val Arg Ser Cys Lys Cys Ser
            100                 105                 110

<210> 21
<211> 442
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..442
<223> /mol_type="protein"
      /note="transforming growth factor beta-2 isoform 1 precursor"
      /organism="Homo sapiens"

<400> 21
Met His Tyr Cys Val Leu Ser Ala Phe Leu Ile Leu His Leu Val Thr
1               5                   10                  15
```

```
Val Ala Leu Ser Leu Ser Thr Cys Ser Thr Leu Asp Met Asp Gln Phe
            20                  25                  30
Met Arg Lys Arg Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu
        35                  40                  45
Lys Leu Thr Ser Pro Pro Glu Asp Tyr Pro Glu Pro Glu Glu Val Pro
    50                  55                  60
Pro Glu Val Ile Ser Ile Tyr Asn Ser Thr Arg Asp Leu Leu Gln Glu
65                  70                  75                  80
Lys Ala Ser Arg Arg Ala Ala Ala Cys Glu Arg Glu Arg Ser Asp Glu
                85                  90                  95
Glu Tyr Tyr Ala Lys Glu Val Tyr Lys Ile Asp Met Pro Pro Phe Phe
            100                 105                 110
Pro Ser Glu Thr Val Cys Pro Val Val Thr Thr Pro Ser Gly Ser Val
        115                 120                 125
Gly Ser Leu Cys Ser Arg Gln Ser Gln Val Leu Cys Gly Tyr Leu Asp
    130                 135                 140
Ala Ile Pro Pro Thr Phe Tyr Arg Pro Tyr Phe Arg Ile Val Arg Phe
145                 150                 155                 160
Asp Val Ser Ala Met Glu Lys Asn Ala Ser Asn Leu Val Lys Ala Glu
                165                 170                 175
Phe Arg Val Phe Arg Leu Gln Asn Pro Lys Ala Arg Val Pro Glu Gln
            180                 185                 190
Arg Ile Glu Leu Tyr Gln Ile Leu Lys Ser Lys Asp Leu Thr Ser Pro
        195                 200                 205
Thr Gln Arg Tyr Ile Asp Ser Lys Val Val Lys Thr Arg Ala Glu Gly
    210                 215                 220
Glu Trp Leu Ser Phe Asp Val Thr Asp Ala Val His Glu Trp Leu His
225                 230                 235                 240
His Lys Asp Arg Asn Leu Gly Phe Lys Ile Ser Leu His Cys Pro Cys
                245                 250                 255
Cys Thr Phe Val Pro Ser Asn Asn Tyr Ile Ile Pro Asn Lys Ser Glu
            260                 265                 270
Glu Leu Glu Ala Arg Phe Ala Gly Ile Asp Gly Thr Ser Thr Tyr Thr
        275                 280                 285
Ser Gly Asp Gln Lys Thr Ile Lys Ser Thr Arg Lys Lys Asn Ser Gly
    290                 295                 300
Lys Thr Pro His Leu Leu Leu Met Leu Leu Pro Ser Tyr Arg Leu Glu
305                 310                 315                 320
Ser Gln Gln Thr Asn Arg Arg Lys Lys Arg Ala Leu Asp Ala Ala Tyr
                325                 330                 335
Cys Phe Arg Asn Val Gln Asp Asn Cys Cys Leu Arg Pro Leu Tyr Ile
            340                 345                 350
Asp Phe Lys Arg Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys Gly
        355                 360                 365
Tyr Asn Ala Asn Phe Cys Ala Gly Ala Cys Pro Tyr Leu Trp Ser Ser
    370                 375                 380
Asp Thr Gln His Ser Arg Val Leu Ser Leu Tyr Asn Thr Ile Asn Pro
385                 390                 395                 400
```

```
Glu Ala Ser Ala Ser Pro Cys Cys Val Ser Gln Asp Leu Glu Pro Leu
                405                 410                 415
Thr Ile Leu Tyr Tyr Ile Gly Lys Thr Pro Lys Ile Glu Gln Leu Ser
            420                 425                 430
Asn Met Ile Val Lys Ser Cys Lys Cys Ser
        435                 440
```

<210> 22
<211> 414
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..414
<223> /mol_type="protein"
/note="transforming growth factor beta-2 isoform 2 precursor"
/organism="Homo sapiens"

<400> 22

```
Met His Tyr Cys Val Leu Ser Ala Phe Leu Ile Leu His Leu Val Thr
1               5                  10                  15
Val Ala Leu Ser Leu Ser Thr Cys Ser Thr Leu Asp Met Asp Gln Phe
            20                  25                  30
Met Arg Lys Arg Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu
        35                  40                  45
Lys Leu Thr Ser Pro Pro Glu Asp Tyr Pro Glu Pro Glu Glu Val Pro
    50                  55                  60
Pro Glu Val Ile Ser Ile Tyr Asn Ser Thr Arg Asp Leu Leu Gln Glu
65                  70                  75                  80
Lys Ala Ser Arg Arg Ala Ala Ala Cys Glu Arg Glu Arg Ser Asp Glu
                85                  90                  95
Glu Tyr Tyr Ala Lys Glu Val Tyr Lys Ile Asp Met Pro Pro Phe Phe
            100                 105                 110
Pro Ser Glu Asn Ala Ile Pro Pro Thr Phe Tyr Arg Pro Tyr Phe Arg
        115                 120                 125
Ile Val Arg Phe Asp Val Ser Ala Met Glu Lys Asn Ala Ser Asn Leu
    130                 135                 140
Val Lys Ala Glu Phe Arg Val Phe Arg Leu Gln Asn Pro Lys Ala Arg
145                 150                 155                 160
Val Pro Glu Gln Arg Ile Glu Leu Tyr Gln Ile Leu Lys Ser Lys Asp
                165                 170                 175
Leu Thr Ser Pro Thr Gln Arg Tyr Ile Asp Ser Lys Val Val Lys Thr
            180                 185                 190
Arg Ala Glu Gly Glu Trp Leu Ser Phe Asp Val Thr Asp Ala Val His
        195                 200                 205
Glu Trp Leu His His Lys Asp Arg Asn Leu Gly Phe Lys Ile Ser Leu
    210                 215                 220
```

```
His Cys Pro Cys Cys Thr Phe Val Pro Ser Asn Asn Tyr Ile Ile Pro
225                 230                 235                 240
Asn Lys Ser Glu Glu Leu Glu Ala Arg Phe Ala Gly Ile Asp Gly Thr
                245                 250                 255
Ser Thr Tyr Thr Ser Gly Asp Gln Lys Thr Ile Lys Ser Thr Arg Lys
            260                 265                 270
Lys Asn Ser Gly Lys Thr Pro His Leu Leu Leu Met Leu Leu Pro Ser
        275                 280                 285
Tyr Arg Leu Glu Ser Gln Gln Thr Asn Arg Arg Lys Lys Arg Ala Leu
    290                 295                 300
Asp Ala Ala Tyr Cys Phe Arg Asn Val Gln Asp Asn Cys Cys Leu Arg
305                 310                 315                 320
Pro Leu Tyr Ile Asp Phe Lys Arg Asp Leu Gly Trp Lys Trp Ile His
                325                 330                 335
Glu Pro Lys Gly Tyr Asn Ala Asn Phe Cys Ala Gly Ala Cys Pro Tyr
            340                 345                 350
Leu Trp Ser Ser Asp Thr Gln His Ser Arg Val Leu Ser Leu Tyr Asn
        355                 360                 365
Thr Ile Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Ser Gln Asp
    370                 375                 380
Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Ile Gly Lys Thr Pro Lys Ile
385                 390                 395                 400
Glu Gln Leu Ser Asn Met Ile Val Lys Ser Cys Lys Cys Ser
                405                 410
```

<210> 23
<211> 112
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..112
<223> /mol_type="protein"
/note="transforming growth factor beta-2"
/organism="Homo sapiens"

<400> 23

```
Ala Leu Asp Ala Ala Tyr Cys Phe Arg Asn Val Gln Asp Asn Cys Cys
1               5                   10                  15
Leu Arg Pro Leu Tyr Ile Asp Phe Lys Arg Asp Leu Gly Trp Lys Trp
            20                  25                  30
Ile His Glu Pro Lys Gly Tyr Asn Ala Asn Phe Cys Ala Gly Ala Cys
        35                  40                  45
Pro Tyr Leu Trp Ser Ser Asp Thr Gln His Ser Arg Val Leu Ser Leu
    50                  55                  60
Tyr Asn Thr Ile Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Ser
65                  70                  75                  80
```

```
Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Ile Gly Lys Thr Pro
                85                  90                  95
Lys Ile Glu Gln Leu Ser Asn Met Ile Val Lys Ser Cys Lys Cys Ser
            100                 105                 110
```

<210> 24
<211> 412
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..412
<223> /mol_type="protein"
/note="transforming growth factor beta-3 preproprotein"
/organism="Homo sapiens"

<400> 24

```
Met Lys Met His Leu Gln Arg Ala Leu Val Val Leu Ala Leu Leu Asn
1               5                  10                  15
Phe Ala Thr Val Ser Leu Ser Leu Ser Thr Cys Thr Thr Leu Asp Phe
            20                  25                  30
Gly His Ile Lys Lys Lys Arg Val Glu Ala Ile Arg Gly Gln Ile Leu
        35                  40                  45
Ser Lys Leu Arg Leu Thr Ser Pro Pro Glu Pro Thr Val Met Thr His
    50                  55                  60
Val Pro Tyr Gln Val Leu Ala Leu Tyr Asn Ser Thr Arg Glu Leu Leu
65                  70                  75                  80
Glu Glu Met His Gly Glu Arg Glu Glu Gly Cys Thr Gln Glu Asn Thr
                85                  90                  95
Glu Ser Glu Tyr Tyr Ala Lys Glu Ile His Lys Phe Asp Met Ile Gln
            100                 105                 110
Gly Leu Ala Glu His Asn Glu Leu Ala Val Cys Pro Lys Gly Ile Thr
        115                 120                 125
Ser Lys Val Phe Arg Phe Asn Val Ser Ser Val Glu Lys Asn Arg Thr
    130                 135                 140
Asn Leu Phe Arg Ala Glu Phe Arg Val Leu Arg Val Pro Asn Pro Ser
145                 150                 155                 160
Ser Lys Arg Asn Glu Gln Arg Ile Glu Leu Phe Gln Ile Leu Arg Pro
                165                 170                 175
Asp Glu His Ile Ala Lys Gln Arg Tyr Ile Gly Gly Lys Asn Leu Pro
            180                 185                 190
Thr Arg Gly Thr Ala Glu Trp Leu Ser Phe Asp Val Thr Asp Thr Val
        195                 200                 205
Arg Glu Trp Leu Leu Arg Arg Glu Ser Asn Leu Gly Leu Glu Ile Ser
    210                 215                 220
Ile His Cys Pro Cys His Thr Phe Gln Pro Asn Gly Asp Ile Leu Glu
225                 230                 235                 240
```

```
Asn Ile His Glu Val Met Glu Ile Lys Phe Lys Gly Val Asp Asn Glu
                245                 250                 255
Asp Asp His Gly Arg Gly Asp Leu Gly Arg Leu Lys Lys Gln Lys Asp
            260                 265                 270
His His Asn Pro His Leu Ile Leu Met Met Ile Pro Pro His Arg Leu
        275                 280                 285
Asp Asn Pro Gly Gln Gly Gly Gln Arg Lys Lys Arg Ala Leu Asp Thr
    290                 295                 300
Asn Tyr Cys Phe Arg Asn Leu Glu Glu Asn Cys Cys Val Arg Pro Leu
305                 310                 315                 320
Tyr Ile Asp Phe Arg Gln Asp Leu Gly Trp Lys Trp Val His Glu Pro
                325                 330                 335
Lys Gly Tyr Tyr Ala Asn Phe Cys Ser Gly Pro Cys Pro Tyr Leu Arg
            340                 345                 350
Ser Ala Asp Thr Thr His Ser Thr Val Leu Gly Leu Tyr Asn Thr Leu
        355                 360                 365
Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Pro Gln Asp Leu Glu
    370                 375                 380
Pro Leu Thr Ile Leu Tyr Tyr Val Gly Arg Thr Pro Lys Val Glu Gln
385                 390                 395                 400
Leu Ser Asn Met Val Val Lys Ser Cys Lys Cys Ser
                405                 410
```

<210> 25
<211> 112
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..112
<223> /mol_type="protein"
/note="transforming growth factor beta-3"
/organism="Homo sapiens"

<400> 25

```
Ala Leu Asp Thr Asn Tyr Cys Phe Arg Asn Leu Glu Glu Asn Cys Cys
1               5                   10                  15
Val Arg Pro Leu Tyr Ile Asp Phe Arg Gln Asp Leu Gly Trp Lys Trp
            20                  25                  30
Val His Glu Pro Lys Gly Tyr Tyr Ala Asn Phe Cys Ser Gly Pro Cys
        35                  40                  45
Pro Tyr Leu Arg Ser Ala Asp Thr Thr His Ser Thr Val Leu Gly Leu
    50                  55                  60
Tyr Asn Thr Leu Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Pro
65                  70                  75                  80
Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Val Gly Arg Thr Pro
                85                  90                  95
```

```
Lys Val Glu Gln Leu Ser Asn Met Val Val Lys Ser Cys Lys Cys Ser
            100                 105                 110

<210> 26
<211> 288
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..288
<223> /mol_type="protein"
      /note="fibroblast growth factor 2 precursor"
      /organism="Homo sapiens"

<400> 26
Met Val Gly Val Gly Gly Gly Asp Val Glu Asp Val Thr Pro Arg Pro
1               5                  10                  15
Gly Gly Cys Gln Ile Ser Gly Arg Gly Ala Arg Gly Cys Asn Gly Ile
            20                  25                  30
Pro Gly Ala Ala Ala Trp Glu Ala Ala Leu Pro Arg Arg Arg Pro Arg
        35                  40                  45
Arg His Pro Ser Val Asn Pro Arg Ser Arg Ala Ala Gly Ser Pro Arg
    50                  55                  60
Thr Arg Gly Arg Arg Thr Glu Glu Arg Pro Ser Gly Ser Arg Leu Gly
65                  70                  75                  80
Asp Arg Gly Arg Gly Arg Ala Leu Pro Gly Gly Arg Leu Gly Gly Arg
                85                  90                  95
Gly Arg Gly Arg Ala Pro Glu Arg Val Gly Gly Arg Gly Arg Gly Arg
            100                 105                 110
Gly Thr Ala Ala Pro Arg Ala Ala Pro Ala Ala Arg Gly Ser Arg Pro
        115                 120                 125
Gly Pro Ala Gly Thr Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala
    130                 135                 140
Leu Pro Glu Asp Gly Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys
145                 150                 155                 160
Asp Pro Lys Arg Leu Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile
                165                 170                 175
His Pro Asp Gly Arg Val Asp Gly Val Arg Glu Lys Ser Asp Pro His
            180                 185                 190
Ile Lys Leu Gln Leu Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys
        195                 200                 205
Gly Val Cys Ala Asn Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu
    210                 215                 220
Leu Ala Ser Lys Cys Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu
225                 230                 235                 240
Glu Ser Asn Asn Tyr Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp
                245                 250                 255
```

```
Tyr Val Ala Leu Lys Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr
            260                 265                 270
Gly Pro Gly Gln Lys Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
        275                 280                 285
```

<210> 27
<211> 155
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..155
<223> /mol_type="protein"
/note="mature FGF2"
/organism="Homo sapiens"

<400> 27

```
Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1               5                   10                  15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
            20                  25                  30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
        35                  40                  45
Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
    50                  55                  60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
65                  70                  75                  80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
                85                  90                  95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
            100                 105                 110
Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
        115                 120                 125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
    130                 135                 140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145                 150                 155
```

<210> 28
<211> 146
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..146
<223> /mol_type="protein"

/note="fragment of fibroblast growth factor 2"
/organism="Homo sapiens"

<400> 28
Pro Ala Leu Pro Glu Asp Gly Gly Ser Gly Ala Phe Pro Pro Gly His
1 5 10 15
Phe Lys Asp Pro Lys Arg Leu Tyr Cys Lys Asn Gly Gly Phe Phe Leu
20 25 30
Arg Ile His Pro Asp Gly Arg Val Asp Gly Val Arg Glu Lys Ser Asp
35 40 45
Pro His Ile Lys Leu Gln Leu Gln Ala Glu Glu Arg Gly Val Val Ser
50 55 60
Ile Lys Gly Val Cys Ala Asn Arg Tyr Leu Ala Met Lys Glu Asp Gly
65 70 75 80
Arg Leu Leu Ala Ser Lys Cys Val Thr Asp Glu Cys Phe Phe Phe Glu
85 90 95
Arg Leu Glu Ser Asn Asn Tyr Asn Thr Tyr Arg Ser Arg Lys Tyr Thr
100 105 110
Ser Trp Tyr Val Ala Leu Lys Arg Thr Gly Gln Tyr Lys Leu Gly Ser
115 120 125
Lys Thr Gly Pro Gly Gln Lys Ala Ile Leu Phe Leu Pro Met Ser Ala
130 135 140
Lys Ser
145

<210> 29
<211> 180
<212> PRT
<213> artificial sequences

<220>
<221> SOURCE
<222> 1..180
<223> /mol_type="protein"
/note="sythetic construct hFGF2-153 precursor protein "
/organism="artificial sequences"

<400> 29
Met Lys Lys Lys Ile Ile Ser Ala Ile Leu Met Ser Thr Val Ile Leu
1 5 10 15
Ser Ala Ala Ala Pro Leu Ser Gly Val Tyr Ala Ala Gly Ser Ile Thr
20 25 30
Thr Leu Pro Ala Leu Pro Glu Asp Gly Gly Ser Gly Ala Phe Pro Pro
35 40 45
Gly His Phe Lys Asp Pro Lys Arg Leu Tyr Cys Lys Asn Gly Gly Phe
50 55 60
Phe Leu Arg Ile His Pro Asp Gly Arg Val Asp Gly Val Arg Glu Lys
65 70 75 80

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Ser Asp Pro His Ile Lys Leu Gln Leu Gln Ala Glu Glu Arg Gly Val
85 90 95
Val Ser Ile Lys Gly Val Cys Ala Asn Arg Tyr Leu Ala Met Lys Glu
100 105 110
Asp Gly Arg Leu Leu Ala Ser Lys Cys Val Thr Asp Glu Cys Phe Phe
115 120 125
Phe Glu Arg Leu Glu Ser Asn Asn Tyr Asn Thr Tyr Arg Ser Arg Lys
130 135 140
Tyr Thr Ser Trp Tyr Val Ala Leu Lys Arg Thr Gly Gln Tyr Lys Leu
145 150 155 160
Gly Ser Lys Thr Gly Pro Gly Gln Lys Ala Ile Leu Phe Leu Pro Met
165 170 175
Ser Ala Lys Ser
180

<210> 30
<211> 153
<212> PRT
<213> artificial sequences

<220>
<221> SOURCE
<222> 1..153
<223> /mol_type="protein"
/note="synthetic construct hFGF2-153"
/organism="artificial sequences"

<400> 30
Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly Gly Ser
1 5 10 15
Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu Tyr Cys
20 25 30
Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg Val Asp
35 40 45
Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu Gln Ala
50 55 60
Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn Arg Tyr
65 70 75 80
Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys Val Thr
85 90 95
Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr Asn Thr
100 105 110
Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys Arg Thr
115 120 125
Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys Ala Ile
130 135 140
Leu Phe Leu Pro Met Ser Ala Lys Ser
145 150

<210> 31
<211> 728
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..728
<223> /mol_type="protein"
/note="hepatocyte growth factor"
/organism="Homo sapiens"

<400> 31
Met Trp Val Thr Lys Leu Leu Pro Ala Leu Leu Leu Gln His Val Leu
1 5 10 15
Leu His Leu Leu Leu Leu Pro Ile Ala Ile Pro Tyr Ala Glu Gly Gln
20 25 30
Arg Lys Arg Arg Asn Thr Ile His Glu Phe Lys Lys Ser Ala Lys Thr
35 40 45
Thr Leu Ile Lys Ile Asp Pro Ala Leu Lys Ile Lys Thr Lys Lys Val
50 55 60
Asn Thr Ala Asp Gln Cys Ala Asn Arg Cys Thr Arg Asn Lys Gly Leu
65 70 75 80
Pro Phe Thr Cys Lys Ala Phe Val Phe Asp Lys Ala Arg Lys Gln Cys
85 90 95
Leu Trp Phe Pro Phe Asn Ser Met Ser Ser Gly Val Lys Lys Glu Phe
100 105 110
Gly His Glu Phe Asp Leu Tyr Glu Asn Lys Asp Tyr Ile Arg Asn Cys
115 120 125
Ile Ile Gly Lys Gly Arg Ser Tyr Lys Gly Thr Val Ser Ile Thr Lys
130 135 140
Ser Gly Ile Lys Cys Gln Pro Trp Ser Ser Met Ile Pro His Glu His
145 150 155 160
Ser Phe Leu Pro Ser Ser Tyr Arg Gly Lys Asp Leu Gln Glu Asn Tyr
165 170 175
Cys Arg Asn Pro Arg Gly Glu Glu Gly Gly Pro Trp Cys Phe Thr Ser
180 185 190
Asn Pro Glu Val Arg Tyr Glu Val Cys Asp Ile Pro Gln Cys Ser Glu
195 200 205
Val Glu Cys Met Thr Cys Asn Gly Glu Ser Tyr Arg Gly Leu Met Asp
210 215 220
His Thr Glu Ser Gly Lys Ile Cys Gln Arg Trp Asp His Gln Thr Pro
225 230 235 240
His Arg His Lys Phe Leu Pro Glu Arg Tyr Pro Asp Lys Gly Phe Asp
245 250 255
Asp Asn Tyr Cys Arg Asn Pro Asp Gly Gln Pro Arg Pro Trp Cys Tyr
260 265 270

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Thr Leu Asp Pro His Thr Arg Trp Glu Tyr Cys Ala Ile Lys Thr Cys
        275                 280                 285
Ala Asp Asn Thr Met Asn Asp Thr Asp Val Pro Leu Glu Thr Thr Glu
    290                 295                 300
Cys Ile Gln Gly Gln Gly Glu Gly Tyr Arg Gly Thr Val Asn Thr Ile
305                 310                 315                 320
Trp Asn Gly Ile Pro Cys Gln Arg Trp Asp Ser Gln Tyr Pro His Glu
                325                 330                 335
His Asp Met Thr Pro Glu Asn Phe Lys Cys Lys Asp Leu Arg Glu Asn
            340                 345                 350
Tyr Cys Arg Asn Pro Asp Gly Ser Glu Ser Pro Trp Cys Phe Thr Thr
        355                 360                 365
Asp Pro Asn Ile Arg Val Gly Tyr Cys Ser Gln Ile Pro Asn Cys Asp
    370                 375                 380
Met Ser His Gly Gln Asp Cys Tyr Arg Gly Asn Gly Lys Asn Tyr Met
385                 390                 395                 400
Gly Asn Leu Ser Gln Thr Arg Ser Gly Leu Thr Cys Ser Met Trp Asp
                405                 410                 415
Lys Asn Met Glu Asp Leu His Arg His Ile Phe Trp Glu Pro Asp Ala
            420                 425                 430
Ser Lys Leu Asn Glu Asn Tyr Cys Arg Asn Pro Asp Asp Asp Ala His
        435                 440                 445
Gly Pro Trp Cys Tyr Thr Gly Asn Pro Leu Ile Pro Trp Asp Tyr Cys
    450                 455                 460
Pro Ile Ser Arg Cys Glu Gly Asp Thr Thr Pro Thr Ile Val Asn Leu
465                 470                 475                 480
Asp His Pro Val Ile Ser Cys Ala Lys Thr Lys Gln Leu Arg Val Val
                485                 490                 495
Asn Gly Ile Pro Thr Arg Thr Asn Ile Gly Trp Met Val Ser Leu Arg
            500                 505                 510
Tyr Arg Asn Lys His Ile Cys Gly Gly Ser Leu Ile Lys Glu Ser Trp
        515                 520                 525
Val Leu Thr Ala Arg Gln Cys Phe Pro Ser Arg Asp Leu Lys Asp Tyr
    530                 535                 540
Glu Ala Trp Leu Gly Ile His Asp Val His Gly Arg Gly Asp Glu Lys
545                 550                 555                 560
Cys Lys Gln Val Leu Asn Val Ser Gln Leu Val Tyr Gly Pro Glu Gly
                565                 570                 575
Ser Asp Leu Val Leu Met Lys Leu Ala Arg Pro Ala Val Leu Asp Asp
            580                 585                 590
Phe Val Ser Thr Ile Asp Leu Pro Asn Tyr Gly Cys Thr Ile Pro Glu
        595                 600                 605
Lys Thr Ser Cys Ser Val Tyr Gly Trp Gly Tyr Thr Gly Leu Ile Asn
    610                 615                 620
Tyr Asp Gly Leu Leu Arg Val Ala His Leu Tyr Ile Met Gly Asn Glu
625                 630                 635                 640
Lys Cys Ser Gln His His Arg Gly Lys Val Thr Leu Asn Glu Ser Glu
                645                 650                 655
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Ile Cys Ala Gly Ala Glu Lys Ile Gly Ser Gly Pro Cys Glu Gly Asp
            660                 665                 670
Tyr Gly Gly Pro Leu Val Cys Glu Gln His Lys Met Arg Met Val Leu
        675                 680                 685
Gly Val Ile Val Pro Gly Arg Gly Cys Ala Ile Pro Asn Arg Pro Gly
    690                 695                 700
Ile Phe Val Arg Val Ala Tyr Tyr Ala Lys Trp Ile His Lys Ile Ile
705                 710                 715                 720
Leu Thr Tyr Lys Val Pro Gln Ser
                725
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<211> 463
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
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<223> /mol_type="protein"
/note="hepatocyte growth factor alpha chain"
/organism="Homo sapiens"

<400> 32

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Thr Thr Leu Ile Lys Ile Asp Pro Ala Leu Lys Ile Lys Thr Lys Lys
            20                  25                  30
Val Asn Thr Ala Asp Gln Cys Ala Asn Arg Cys Thr Arg Asn Lys Gly
        35                  40                  45
Leu Pro Phe Thr Cys Lys Ala Phe Val Phe Asp Lys Ala Arg Lys Gln
    50                  55                  60
Cys Leu Trp Phe Pro Phe Asn Ser Met Ser Ser Gly Val Lys Lys Glu
65                  70                  75                  80
Phe Gly His Glu Phe Asp Leu Tyr Glu Asn Lys Asp Tyr Ile Arg Asn
                85                  90                  95
Cys Ile Ile Gly Lys Gly Arg Ser Tyr Lys Gly Thr Val Ser Ile Thr
            100                 105                 110
Lys Ser Gly Ile Lys Cys Gln Pro Trp Ser Ser Met Ile Pro His Glu
        115                 120                 125
His Ser Phe Leu Pro Ser Ser Tyr Arg Gly Lys Asp Leu Gln Glu Asn
    130                 135                 140
Tyr Cys Arg Asn Pro Arg Gly Glu Glu Gly Gly Pro Trp Cys Phe Thr
145                 150                 155                 160
Ser Asn Pro Glu Val Arg Tyr Glu Val Cys Asp Ile Pro Gln Cys Ser
                165                 170                 175
Glu Val Glu Cys Met Thr Cys Asn Gly Glu Ser Tyr Arg Gly Leu Met
            180                 185                 190
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Asp His Thr Glu Ser Gly Lys Ile Cys Gln Arg Trp Asp His Gln Thr
        195                 200                 205
Pro His Arg His Lys Phe Leu Pro Glu Arg Tyr Pro Asp Lys Gly Phe
    210                 215                 220
Asp Asp Asn Tyr Cys Arg Asn Pro Asp Gly Gln Pro Arg Pro Trp Cys
225                 230                 235                 240
Tyr Thr Leu Asp Pro His Thr Arg Trp Glu Tyr Cys Ala Ile Lys Thr
                245                 250                 255
Cys Ala Asp Asn Thr Met Asn Asp Thr Asp Val Pro Leu Glu Thr Thr
            260                 265                 270
Glu Cys Ile Gln Gly Gln Gly Glu Gly Tyr Arg Gly Thr Val Asn Thr
        275                 280                 285
Ile Trp Asn Gly Ile Pro Cys Gln Arg Trp Asp Ser Gln Tyr Pro His
    290                 295                 300
Glu His Asp Met Thr Pro Glu Asn Phe Lys Cys Lys Asp Leu Arg Glu
305                 310                 315                 320
Asn Tyr Cys Arg Asn Pro Asp Gly Ser Glu Ser Pro Trp Cys Phe Thr
                325                 330                 335
Thr Asp Pro Asn Ile Arg Val Gly Tyr Cys Ser Gln Ile Pro Asn Cys
            340                 345                 350
Asp Met Ser His Gly Gln Asp Cys Tyr Arg Gly Asn Gly Lys Asn Tyr
        355                 360                 365
Met Gly Asn Leu Ser Gln Thr Arg Ser Gly Leu Thr Cys Ser Met Trp
    370                 375                 380
Asp Lys Asn Met Glu Asp Leu His Arg His Ile Phe Trp Glu Pro Asp
385                 390                 395                 400
Ala Ser Lys Leu Asn Glu Asn Tyr Cys Arg Asn Pro Asp Asp Asp Ala
                405                 410                 415
His Gly Pro Trp Cys Tyr Thr Gly Asn Pro Leu Ile Pro Trp Asp Tyr
            420                 425                 430
Cys Pro Ile Ser Arg Cys Glu Gly Asp Thr Thr Pro Thr Ile Val Asn
        435                 440                 445
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<210> 33
<211> 234
<212> PRT
<213> Homo sapiens

<220>
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<222> 1..234
<223> /mol_type="protein"
/note="hepatocyte growth factor beta chain"
/organism="Homo sapiens"

<400> 33

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

<210> 34
<211> 27
<212> PRT
<213> Lactococcus lactis

<220>
<221> SOURCE
<222> 1..27
<223> /mol_type="protein"
      /note="Usp45 secretion signal"
      /organism="Lactococcus lactis"

<400> 34
Met Lys Lys Lys Ile Ile Ser Ala Ile Leu Met Ser Thr Val Ile Leu
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Ser Ala Ala Ala Pro Leu Ser Gly Val Tyr Ala
            20                  25
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<211> 2550
<212> DNA
<213> artificial sequences

<220>
<221> source
<222> 1..2550
<223> /mol_type="DNA"
/note="plasmid pNZ8149 "
/organism="artificial sequences"

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gctctgatta aattctgaag tttgttagat acaatgattt cgttcgaagg aactacaaaa 180

taaattataa ggaggcactc accatgggta ctgcaggcat gcggtaccac tagttctaga 240

gagctcaagc tttctttgaa ccaaaattag aaaaccaagg cttgaaacgt tcaattgaaa 300

tggcaattaa acaaattaca gcacgtgttg ctttgattga tagccaaaaa gcagcagttg 360

ataaagcaat tactgatatt gctgaaaaat tgtaatttat aaataaaaat caccttttag 420

aggtggtttt tttatttata aattattcgt ttgatttcgc tttcgataga acaatcaaat 480

cgtttctgag acgttttagc gtttatttcg tttagttatc ggcataatcg ttaaaacagg 540

cgttatcgta gcgtaaaagc ccttgagcgt agcgtggctt tgcagcgaag atgttgtctg 600

ttagattatg aaagccgatg actgaatgaa ataataagcg cagcgtcctt ctatttcggt 660

tggaggaggc tcaagggagt ttgagggaat gaaattccct catgggtttg attttaaaaa 720

ttgcttgcaa ttttgccgag cggtagcgct ggaaaatttt tgaaaaaaat ttggaatttg 780

gaaaaaaatg gggggaaagg aagcgaattt tgcttccgta ctacgacccc ccattaagtg 840

ccgagtgcca atttttgtgc caaaaacgct ctatcccaac tggctcaagg gtttgagggg 900

tttttcaatc gccaacgaat cgccaacgtt ttcgccaacg ttttttataa atctatattt 960

aagtagcttt atttttgttt ttatgattac aaagtgatac actaatttta taaaattatt 1020

tgattggagt tttttaaatg gtgatttcag aatcgaaaaa aagagttatg atttctctga 1080

caaaagagca agataaaaaa ttaacagata tggcgaaaca aaaagatttt tcaaaatctg 1140

cggttgcggc gttagctata gaagaatatg caagaaagga atcagaacaa aaaaaataag 1200

cgaaagctcg cgtttttaga aggatacgag ttttcgctac ttgtttttga taaggtaatt 1260

atatcatggc tattaaaaat actaaagcta gaaattttgg atttttatta tatcctgact 1320

caattcctaa tgattggaaa gaaaaattag agagtttggg cgtatctatg gctgtcagtc 1380

ctttacacga tatggacgaa aaaaaagata aagatacatg gaatagtagt gatgttatac 1440

gaaatggaaa gcactataaa aaaccacact atcacgttat atatattgca cgaaatcctg 1500

taacaataga aagcgttagg aacaagatta agcgaaaatt ggggaatagt tcagttgctc 1560

atgttgagat acttgattat atcaaaggtt catatgaata tttgactcat gaatcaaagg 1620

acgctattgc taagaataaa catatatacg acaaaaaaga tattttgaac attaatgatt 1680

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caaactctag cgcctttaga ttatggtttg agggcaatta tcagtgtgga tatagagcaa 1920

gttatgcaaa ggttcttgat gctgaaacgg gggaaataaa atgacaaaca aagaaaaaga 1980

gttatttgct gaaaatgagg aattaaaaaa agaaattaag gacttaaaag agcgtattga 2040

aagatacaga gaaatggaag ttgaattaag tacaacaata gatttattga gaggagggat 2100

tattgaataa ataaaagccc ccctgacgaa agtcgacatg gactgataaa gtatagtaaa 2160

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aacttattga gaaagggaaa cgacggatca 2550

<210> 36
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<212> DNA
<213> artificial sequences

<220>
<221> source
<222> 1..20
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/organism="artificial sequences"

<400> 36
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<210> 37
<211> 21
<212> DNA
<213> artificial sequences

<220>
<221> source
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<223> /mol_type="DNA"
/note="Sequencing primer seq2F "
/organism="artificial sequences"

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<210> 38
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<212> DNA
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<223> /mol_type="DNA"
/note="sequencing primer seq3F "
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<400> 38
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<210> 39
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<220>
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<400> 39
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<210> 40
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<220>
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<210> 41
<211> 20
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<210> 42
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<220>
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/organism="artificial sequences"

<400> 42
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<210> 43
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<220>
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<222> 1..23
<223> /mol_type="DNA"
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/organism="artificial sequences"

<400> 43
caattgaacg tttcaagcct tgg 23

<210> 44
<211> 198
<212> DNA
<213> Lactococcus lactis

<220>
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<222> 1..198
<223> /mol_type="DNA"
/note="nisinA promoter"
/organism="Lactococcus lactis"

<400> 44
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tataaggagg cactcacc 198

<210> 45
<211> 756
<212> DNA
<213> artificial sequences

<220>
<221> source
<222> 1..756
<223> /mol_type="DNA"
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/organism="artificial sequences"

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ggctctgatt aaattctgaa gtttgttaga tacaatgatt tcgttcgaag gaactacaaa 180

ataaattata aggaggcact caccatgaaa aaaaagatta tctcagctat tttaatgtct 240

acagtgatac tttctgctgc agccccgttg tcaggtgttt acgctgctgg ttccattacg 300

accttgccgg ctttaccaga ggacggaggt tcaggagcct ttccaccagg gcactttaaa 360

gatcccaaac gtctatattg taaaaatgga ggcttctttc tgcgaattca tcctgatgga 420

cgtgtagatg gtgtgcgtga gaaaagtgat cctcatatca aactccaact tcaggcagaa 480

gaaagaggcg tcgtaagtat aaaaggagtt tgcgcgaatc gttacttagc tatgaaagaa 540

gacggtcgat tattggcctc taagtgtgtt actgatgaat gttttttttt tgaacggctt 600

gaatctaata attataacac ttatagaagc agaaaatata catcatggta cgttgcactt 660

aaaaggacag gtcaatataa attagggtct aagacaggac ctggtcaaaa agcaattttg 720

ttcttaccaa tgtcggctaa aagttaataa tctaga 756

<210> 46
<211> 3066
<212> DNA
<213> artificial sequences

<220>
<221> source
<222> 1..3066
<223> /mol_type="DNA"
/note="Plasmid pFGF2"
/organism="artificial sequences"

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ggctctgatt aaattctgaa gtttgttaga tacaatgatt tcgttcgaag gaactacaaa 180

ataaattata aggaggcact caccatgaaa aaaaagatta tctcagctat tttaatgtct 240

acagtgatac tttctgctgc agccccgttg tcaggtgttt acgctgctgg ttccattacg 300

accttgccgg ctttaccaga ggacggaggt tcaggagcct ttccaccagg gcactttaaa 360

gatcccaaac gtctatattg taaaaatgga ggcttctttc tgcgaattca tcctgatgga 420

cgtgtagatg gtgtgcgtga gaaaagtgat cctcatatca aactccaact tcaggcagaa 480

gaaagaggcg tcgtaagtat aaaaggagtt tgcgcgaatc gttacttagc tatgaaagaa 540

gacggtcgat tattggcctc taagtgtgtt actgatgaat gttttttttt tgaacggctt 600

gaatctaata attataacac ttatagaagc agaaaatata catcatggta cgttgcactt 660

aaaaggacag gtcaatataa attagggtct aagacaggac ctggtcaaaa agcaattttg 720

ttcttaccaa tgtcggctaa aagttaataa tctagagagc tcaagctttc tttgaaccaa 780

aattagaaaa ccaaggcttg aaacgttcaa ttgaaatggc aattaaacaa attacagcac 840

gtgttgcttt gattgatagc caaaaagcag cagttgataa agcaattact gatattgctg 900

aaaaattgta atttataaat aaaaatcacc ttttagaggt ggtttttta tttataaatt 960

attcgtttga tttcgctttc gatagaacaa tcaaatcgtt tctgagacgt tttagcgttt 1020

atttcgttta gttatcggca taatcgttaa aacaggcgtt atcgtagcgt aaaagccctt 1080

gagcgtagcg tggctttgca gcgaagatgt tgtctgttag attatgaaag ccgatgactg 1140

aatgaaataa taagcgcagc gtccttctat ttcggttgga ggaggctcaa gggagtttga 1200

gggaatgaaa ttccctcatg ggtttgattt taaaaattgc ttgcaatttt gccgagcggt 1260

agcgctggaa aatttttgaa aaaaatttgg aatttggaaa aaaatggggg gaaaggaagc 1320

gaattttgct tccgtactac gacccccccat taagtgccga gtgccaattt ttgtgccaaa 1380

aacgctctat cccaactggc tcaagggttt gaggggtttt tcaatcgcca acgaatcgcc 1440

aacgttttcg ccaacgtttt ttataaatct atatttaagt agctttattt ttgtttttat 1500

gattacaaag tgatacacta attttataaa attatttgat tggagttttt taaatggtga 1560

tttcagaatc gaaaaaaaga gttatgattt ctctgacaaa agagcaagat aaaaaattaa 1620

cagatatggc gaaacaaaaa gatttttcaa aatctgcggt tgcggcgtta gctatagaag 1680

aatatgcaag aaaggaatca gaacaaaaaa aataagcgaa agctcgcgtt tttagaagga 1740

tacgagtttt cgctacttgt ttttgataag gtaattatat catggctatt aaaaatacta 1800

aagctagaaa ttttggattt ttattatatc ctgactcaat tcctaatgat tggaaagaaa 1860

aattagagag tttgggcgta tctatggctg tcagtccttt acacgatatg gacgaaaaaa 1920

aagataaaga tacatggaat agtagtgatg ttatacgaaa tggaaagcac tataaaaaac 1980

cacactatca cgttatatat attgcacgaa atcctgtaac aatagaaagc gttaggaaca 2040

agattaagcg aaaattgggg aatagttcag ttgctcatgt tgagatactt gattatatca 2100

aaggttcata tgaatatttg actcatgaat caaaggacgc tattgctaag aataaacata 2160

tatacgacaa aaaagatatt ttgaacatta atgattttga tattgaccgc tatataacac 2220

ttgatgaaag ccaaaaaaga gaattgaaga atttactttt agatatagtg gatgactata 2280

atttggtaaa tacaaaagat ttaatggctt ttattcgcct taggggagcg gagtttggaa 2340

ttttaaatac gaatgatgta aaagatattg tttcaacaaa ctctagcgcc tttagattat 2400

ggtttgaggg caattatcag tgtggatata gagcaagtta tgcaaaggtt cttgatgctg 2460

aaacgggggа aataaaatga caaacaaaga aaaagagtta tttgctgaaa atgaggaatt 2520

aaaaaaagaa attaaggact taaaagagcg tattgaaaga tacagagaaa tggaagttga 2580

attaagtaca acaatagatt tattgagagg agggattatt gaataaataa aagcccccct 2640

gacgaaagtc gacatggact gataaagtat agtaaaaaca taaaacggag gatattgttg 2700

tgaacagaga agagatgact ctcttagggt ttgaaattgt tgcttatgct ggagatgctc 2760

gctctaagct tttagaagcg cttaaagcgg ctgaaaatgg tgatttcgct aaggcagata 2820

gtcttgtagt agaagcagga agctgtattg cagaggctca cagttctcag acaggtatgt 2880

tggctcgaga agcttctggg gaggaacttc catacagtgt tactatgatg catggtcagg 2940

atcacttgat gactacgatc ttattaaaag atgtgattca tcacctcatc gaactttata 3000

aaagaggagc aaagtaatta atgcataaac tcattgaact tattgagaaa gggaaacgac 3060

ggatca 3066

<210> 47
<211> 687
<212> DNA
<213> artificial sequences

<220>
<221> source
<222> 1..687
<223> /mol_type="DNA"
/note="synthetic construct ssUsp45-hIL4"
/organism="artificial sequences"

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attctatctt gagaaagtat tggtaataat attattgtcg ataacgcgag cataataaac 120

ggctctgatt aaattctgaa gtttgttaga tacaatgatt tcgttcgaag gaactacaaa 180

ataaattata aggaggcact caccatgaag aaaaagatta ttagtgcaat tttaatgtca 240

acggtcatct taagcgctgc tgccccattg tcaggtgttt atgcagcaca taagtgtgat 300

ataacattac aagaaattat caaaaccctt aatagtttaa ctgaacagaa gactttgtgt 360

accgaattaa ctgtaactga tatttttgct gcttctaaaa atacaactga aaaagagaca 420

ttttgtcgag ctgccacagt gttaagacaa ttttacagtc atcatgaaaa agacacaaga 480

tgtcttggtg ctacggcaca acaatttcat agacacaaac aacttatccg ttttcttaaa 540

cgtttggatc gtaatctgtg gggcttggca ggattgaaca gttgtcctgt taaagaagcc 600

aatcaatcta ctcttgaaaa tttcttagag agattgaaaa caattatgcg agaaaaatat 660

tctaagtgtt catcttaata atctaga 687

<210> 48
<211> 2997
<212> DNA
<213> artificial sequences

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

```
Asp Arg Ile Phe Tyr Ser Thr Trp Lys Met Lys Thr Ile Trp Ile Ala
            260                 265                 270
Asn Lys His Thr Gly Lys Asp Met Val Arg Ile Asn Leu His Ser Ser
        275                 280                 285
Phe Val Pro Leu Gly Glu Leu Lys Val Val His Pro Leu Ala Gln Pro
    290                 295                 300
Lys Ala Glu Asp Asp Thr Trp Glu Pro Glu Gln Lys Leu Cys Lys Leu
305                 310                 315                 320
Arg Lys Gly Asn Cys Ser Ser Thr Val Cys Gly Gln Asp Leu Gln Ser
                325                 330                 335
His Leu Cys Met Cys Ala Glu Gly Tyr Ala Leu Ser Arg Asp Arg Lys
            340                 345                 350
Tyr Cys Glu Asp Val Asn Glu Cys Ala Phe Trp Asn His Gly Cys Thr
        355                 360                 365
Leu Gly Cys Lys Asn Thr Pro Gly Ser Tyr Tyr Cys Thr Cys Pro Val
    370                 375                 380
Gly Phe Val Leu Leu Pro Asp Gly Lys Arg Cys His Gln Leu Val Ser
385                 390                 395                 400
Cys Pro Arg Asn Val Ser Glu Cys Ser His Asp Cys Val Leu Thr Ser
                405                 410                 415
Glu Gly Pro Leu Cys Phe Cys Pro Glu Gly Ser Val Leu Glu Arg Asp
            420                 425                 430
Gly Lys Thr Cys Ser Gly Cys Ser Ser Pro Asp Asn Gly Gly Cys Ser
        435                 440                 445
Gln Leu Cys Val Pro Leu Ser Pro Val Ser Trp Glu Cys Asp Cys Phe
    450                 455                 460
Pro Gly Tyr Asp Leu Gln Leu Asp Glu Lys Ser Cys Ala Ala Ser Gly
465                 470                 475                 480
Pro Gln Pro Phe Leu Leu Phe Ala Asn Ser Gln Asp Ile Arg His Met
                485                 490                 495
His Phe Asp Gly Thr Asp Tyr Gly Thr Leu Leu Ser Gln Gln Met Gly
            500                 505                 510
Met Val Tyr Ala Leu Asp His Asp Pro Val Glu Asn Lys Ile Tyr Phe
        515                 520                 525
Ala His Thr Ala Leu Lys Trp Ile Glu Arg Ala Asn Met Asp Gly Ser
    530                 535                 540
Gln Arg Glu Arg Leu Ile Glu Glu Gly Val Asp Val Pro Glu Gly Leu
545                 550                 555                 560
Ala Val Asp Trp Ile Gly Arg Arg Phe Tyr Trp Thr Asp Arg Gly Lys
                565                 570                 575
Ser Leu Ile Gly Arg Ser Asp Leu Asn Gly Lys Arg Ser Lys Ile Ile
            580                 585                 590
Thr Lys Glu Asn Ile Ser Gln Pro Arg Gly Ile Ala Val His Pro Met
        595                 600                 605
Ala Lys Arg Leu Phe Trp Thr Asp Thr Gly Ile Asn Pro Arg Ile Glu
    610                 615                 620
Ser Ser Ser Leu Gln Gly Leu Gly Arg Leu Val Ile Ala Ser Ser Asp
625                 630                 635                 640
```

```
Leu Ile Trp Pro Ser Gly Ile Thr Ile Asp Phe Leu Thr Asp Lys Leu
                645                 650                 655
Tyr Trp Cys Asp Ala Lys Gln Ser Val Ile Glu Met Ala Asn Leu Asp
            660                 665                 670
Gly Ser Lys Arg Arg Arg Leu Thr Gln Asn Asp Val Gly His Pro Phe
        675                 680                 685
Ala Val Ala Val Phe Glu Asp Tyr Val Trp Phe Ser Asp Trp Ala Met
    690                 695                 700
Pro Ser Val Met Arg Val Asn Lys Arg Thr Gly Lys Asp Arg Val Arg
705                 710                 715                 720
Leu Gln Gly Ser Met Leu Lys Pro Ser Ser Leu Val Val Val His Pro
                725                 730                 735
Leu Ala Lys Pro Gly Ala Asp Pro Cys Leu Tyr Gln Asn Gly Gly Cys
            740                 745                 750
Glu His Ile Cys Lys Lys Arg Leu Gly Thr Ala Trp Cys Ser Cys Arg
        755                 760                 765
Glu Gly Phe Met Lys Ala Ser Asp Gly Lys Thr Cys Leu Ala Leu Asp
    770                 775                 780
Gly His Gln Leu Leu Ala Gly Gly Glu Val Asp Leu Lys Asn Gln Val
785                 790                 795                 800
Thr Pro Leu Asp Ile Leu Ser Lys Thr Arg Val Ser Glu Asp Asn Ile
                805                 810                 815
Thr Glu Ser Gln His Met Leu Val Ala Glu Ile Met Val Ser Asp Gln
            820                 825                 830
Asp Asp Cys Ala Pro Val Gly Cys Ser Met Tyr Ala Arg Cys Ile Ser
        835                 840                 845
Glu Gly Glu Asp Ala Thr Cys Gln Cys Leu Lys Gly Phe Ala Gly Asp
    850                 855                 860
Gly Lys Leu Cys Ser Asp Ile Asp Glu Cys Glu Met Gly Val Pro Val
865                 870                 875                 880
Cys Pro Pro Ala Ser Ser Lys Cys Ile Asn Thr Glu Gly Gly Tyr Val
                885                 890                 895
Cys Arg Cys Ser Glu Gly Tyr Gln Gly Asp Gly Ile His Cys Leu Asp
            900                 905                 910
Ile Asp Glu Cys Gln Leu Gly Glu His Ser Cys Gly Glu Asn Ala Ser
        915                 920                 925
Cys Thr Asn Thr Glu Gly Gly Tyr Thr Cys Met Cys Ala Gly Arg Leu
    930                 935                 940
Ser Glu Pro Gly Leu Ile Cys Pro Asp Ser Thr Pro Pro Pro His Leu
945                 950                 955                 960
Arg Glu Asp Asp His His Tyr Ser Val Arg Asn Ser Asp Ser Glu Cys
                965                 970                 975
Pro Leu Ser His Asp Gly Tyr Cys Leu His Asp Gly Val Cys Met Tyr
            980                 985                 990
Ile Glu Ala Leu Asp Lys Tyr Ala Cys Asn Cys Val Val Gly Tyr Ile
        995                 1000                1005
Gly Glu Arg Cys Gln Tyr Arg Asp Leu Lys Trp Trp Glu Leu Arg His
    1010                1015                1020
```

```
Ala Gly His Gly Gln Gln Gln Lys Val Ile Val Val Ala Val Cys Val
1025                1030                1035                1040
Val Val Leu Val Met Leu Leu Leu Leu Ser Leu Trp Gly Ala His Tyr
                1045                1050                1055
Tyr Arg Thr Gln Lys Leu Leu Ser Lys Asn Pro Lys Asn Pro Tyr Glu
            1060                1065                1070
Glu Ser Ser Arg Asp Val Arg Ser Arg Arg Pro Ala Asp Thr Glu Asp
        1075                1080                1085
Gly Met Ser Ser Cys Pro Gln Pro Trp Phe Val Val Ile Lys Glu His
    1090                1095                1100
Gln Asp Leu Lys Asn Gly Gly Gln Pro Val Ala Gly Glu Asp Gly Gln
1105                1110                1115                1120
Ala Ala Asp Gly Ser Met Gln Pro Thr Ser Trp Arg Gln Glu Pro Gln
                1125                1130                1135
Leu Cys Gly Met Gly Thr Glu Gln Gly Cys Trp Ile Pro Val Ser Ser
            1140                1145                1150
Asp Lys Gly Ser Cys Pro Gln Val Met Glu Arg Ser Phe His Met Pro
        1155                1160                1165
Ser Tyr Gly Thr Gln Thr Leu Glu Gly Gly Val Glu Lys Pro His Ser
    1170                1175                1180
Leu Leu Ser Ala Asn Pro Leu Trp Gln Gln Arg Ala Leu Asp Pro Pro
1185                1190                1195                1200
His Gln Met Glu Leu Thr Gln
                1205

<210> 59
<211> 1165
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..1165
<223> /mol_type="protein"
      /note="epidermal growth factor isoform 2 preproprotein "
      /organism="Homo sapiens"

<400> 59
Met Leu Leu Thr Leu Ile Ile Leu Leu Pro Val Val Ser Lys Phe Ser
1               5                   10                  15
Phe Val Ser Leu Ser Ala Pro Gln His Trp Ser Cys Pro Glu Gly Thr
            20                  25                  30
Leu Ala Gly Asn Gly Asn Ser Thr Cys Val Gly Pro Ala Pro Phe Leu
        35                  40                  45
Ile Phe Ser His Gly Asn Ser Ile Phe Arg Ile Asp Thr Glu Gly Thr
    50                  55                  60
Asn Tyr Glu Gln Leu Val Val Asp Ala Gly Val Ser Val Ile Met Asp
65                  70                  75                  80
```

```
Phe His Tyr Asn Glu Lys Arg Ile Tyr Trp Val Asp Leu Glu Arg Gln
                85                  90                  95
Leu Leu Gln Arg Val Phe Leu Asn Gly Ser Arg Gln Glu Arg Val Cys
            100                 105                 110
Asn Ile Glu Lys Asn Val Ser Gly Met Ala Ile Asn Trp Ile Asn Glu
        115                 120                 125
Glu Val Ile Trp Ser Asn Gln Gln Glu Gly Ile Ile Thr Val Thr Asp
    130                 135                 140
Met Lys Gly Asn Asn Ser His Ile Leu Leu Ser Ala Leu Lys Tyr Pro
145                 150                 155                 160
Ala Asn Val Ala Val Asp Pro Val Glu Arg Phe Ile Phe Trp Ser Ser
                165                 170                 175
Glu Val Ala Gly Ser Leu Tyr Arg Ala Asp Leu Asp Gly Val Gly Val
            180                 185                 190
Lys Ala Leu Leu Glu Thr Ser Glu Lys Ile Thr Ala Val Ser Leu Asp
        195                 200                 205
Val Leu Asp Lys Arg Leu Phe Trp Ile Gln Tyr Asn Arg Glu Gly Ser
    210                 215                 220
Asn Ser Leu Ile Cys Ser Cys Asp Tyr Asp Gly Gly Ser Val His Ile
225                 230                 235                 240
Ser Lys His Pro Thr Gln His Asn Leu Phe Ala Met Ser Leu Phe Gly
                245                 250                 255
Asp Arg Ile Phe Tyr Ser Thr Trp Lys Met Lys Thr Ile Trp Ile Ala
            260                 265                 270
Asn Lys His Thr Gly Lys Asp Met Val Arg Ile Asn Leu His Ser Ser
        275                 280                 285
Phe Val Pro Leu Gly Glu Leu Lys Val Val His Pro Leu Ala Gln Pro
    290                 295                 300
Lys Ala Glu Asp Asp Thr Trp Glu Pro Asp Val Asn Glu Cys Ala Phe
305                 310                 315                 320
Trp Asn His Gly Cys Thr Leu Gly Cys Lys Asn Thr Pro Gly Ser Tyr
                325                 330                 335
Tyr Cys Thr Cys Pro Val Gly Phe Val Leu Leu Pro Asp Gly Lys Arg
            340                 345                 350
Cys His Gln Leu Val Ser Cys Pro Arg Asn Val Ser Glu Cys Ser His
        355                 360                 365
Asp Cys Val Leu Thr Ser Glu Gly Pro Leu Cys Phe Cys Pro Glu Gly
    370                 375                 380
Ser Val Leu Glu Arg Asp Gly Lys Thr Cys Ser Gly Cys Ser Ser Pro
385                 390                 395                 400
Asp Asn Gly Gly Cys Ser Gln Leu Cys Val Pro Leu Ser Pro Val Ser
                405                 410                 415
Trp Glu Cys Asp Cys Phe Pro Gly Tyr Asp Leu Gln Leu Asp Glu Lys
            420                 425                 430
Ser Cys Ala Ala Ser Gly Pro Gln Pro Phe Leu Leu Phe Ala Asn Ser
        435                 440                 445
Gln Asp Ile Arg His Met His Phe Asp Gly Thr Asp Tyr Gly Thr Leu
    450                 455                 460
```

```
Leu Ser Gln Gln Met Gly Met Val Tyr Ala Leu Asp His Asp Pro Val
465                 470                 475                 480
Glu Asn Lys Ile Tyr Phe Ala His Thr Ala Leu Lys Trp Ile Glu Arg
                485                 490                 495
Ala Asn Met Asp Gly Ser Gln Arg Glu Arg Leu Ile Glu Glu Gly Val
            500                 505                 510
Asp Val Pro Glu Gly Leu Ala Val Asp Trp Ile Gly Arg Arg Phe Tyr
        515                 520                 525
Trp Thr Asp Arg Gly Lys Ser Leu Ile Gly Arg Ser Asp Leu Asn Gly
    530                 535                 540
Lys Arg Ser Lys Ile Ile Thr Lys Glu Asn Ile Ser Gln Pro Arg Gly
545                 550                 555                 560
Ile Ala Val His Pro Met Ala Lys Arg Leu Phe Trp Thr Asp Thr Gly
                565                 570                 575
Ile Asn Pro Arg Ile Glu Ser Ser Ser Leu Gln Gly Leu Gly Arg Leu
            580                 585                 590
Val Ile Ala Ser Ser Asp Leu Ile Trp Pro Ser Gly Ile Thr Ile Asp
        595                 600                 605
Phe Leu Thr Asp Lys Leu Tyr Trp Cys Asp Ala Lys Gln Ser Val Ile
    610                 615                 620
Glu Met Ala Asn Leu Asp Gly Ser Lys Arg Arg Arg Leu Thr Gln Asn
625                 630                 635                 640
Asp Val Gly His Pro Phe Ala Val Ala Val Phe Glu Asp Tyr Val Trp
                645                 650                 655
Phe Ser Asp Trp Ala Met Pro Ser Val Met Arg Val Asn Lys Arg Thr
            660                 665                 670
Gly Lys Asp Arg Val Arg Leu Gln Gly Ser Met Leu Lys Pro Ser Ser
        675                 680                 685
Leu Val Val Val His Pro Leu Ala Lys Pro Gly Ala Asp Pro Cys Leu
    690                 695                 700
Tyr Gln Asn Gly Gly Cys Glu His Ile Cys Lys Lys Arg Leu Gly Thr
705                 710                 715                 720
Ala Trp Cys Ser Cys Arg Glu Gly Phe Met Lys Ala Ser Asp Gly Lys
                725                 730                 735
Thr Cys Leu Ala Leu Asp Gly His Gln Leu Leu Ala Gly Gly Glu Val
            740                 745                 750
Asp Leu Lys Asn Gln Val Thr Pro Leu Asp Ile Leu Ser Lys Thr Arg
        755                 760                 765
Val Ser Glu Asp Asn Ile Thr Glu Ser Gln His Met Leu Val Ala Glu
    770                 775                 780
Ile Met Val Ser Asp Gln Asp Asp Cys Ala Pro Val Gly Cys Ser Met
785                 790                 795                 800
Tyr Ala Arg Cys Ile Ser Glu Gly Glu Asp Ala Thr Cys Gln Cys Leu
                805                 810                 815
Lys Gly Phe Ala Gly Asp Gly Lys Leu Cys Ser Asp Ile Asp Glu Cys
            820                 825                 830
Glu Met Gly Val Pro Val Cys Pro Pro Ala Ser Ser Lys Cys Ile Asn
        835                 840                 845
```

```
Thr Glu Gly Gly Tyr Val Cys Arg Cys Ser Glu Gly Tyr Gln Gly Asp
    850                 855                 860
Gly Ile His Cys Leu Asp Ile Asp Glu Cys Gln Leu Gly Glu His Ser
865                 870                 875                 880
Cys Gly Glu Asn Ala Ser Cys Thr Asn Thr Glu Gly Gly Tyr Thr Cys
                885                 890                 895
Met Cys Ala Gly Arg Leu Ser Glu Pro Gly Leu Ile Cys Pro Asp Ser
            900                 905                 910
Thr Pro Pro Pro His Leu Arg Glu Asp Asp His His Tyr Ser Val Arg
        915                 920                 925
Asn Ser Asp Ser Glu Cys Pro Leu Ser His Asp Gly Tyr Cys Leu His
    930                 935                 940
Asp Gly Val Cys Met Tyr Ile Glu Ala Leu Asp Lys Tyr Ala Cys Asn
945                 950                 955                 960
Cys Val Val Gly Tyr Ile Gly Glu Arg Cys Gln Tyr Arg Asp Leu Lys
                965                 970                 975
Trp Trp Glu Leu Arg His Ala Gly His Gly Gln Gln Gln Lys Val Ile
            980                 985                 990
Val Val Ala Val Cys Val Val Val Leu Val Met Leu Leu Leu Leu Ser
        995                 1000                1005
Leu Trp Gly Ala His Tyr Tyr Arg Thr Gln Lys Leu Leu Ser Lys Asn
    1010                1015                1020
Pro Lys Asn Pro Tyr Glu Glu Ser Ser Arg Asp Val Arg Ser Arg Arg
1025                1030                1035                1040
Pro Ala Asp Thr Glu Asp Gly Met Ser Ser Cys Pro Gln Pro Trp Phe
                1045                1050                1055
Val Val Ile Lys Glu His Gln Asp Leu Lys Asn Gly Gly Gln Pro Val
            1060                1065                1070
Ala Gly Glu Asp Gly Gln Ala Ala Asp Gly Ser Met Gln Pro Thr Ser
        1075                1080                1085
Trp Arg Gln Glu Pro Gln Leu Cys Gly Met Gly Thr Glu Gln Gly Cys
    1090                1095                1100
Trp Ile Pro Val Ser Ser Asp Lys Gly Ser Cys Pro Gln Val Met Glu
1105                1110                1115                1120
Arg Ser Phe His Met Pro Ser Tyr Gly Thr Gln Thr Leu Glu Gly Gly
                1125                1130                1135
Val Glu Lys Pro His Ser Leu Leu Ser Ala Asn Pro Leu Trp Gln Gln
            1140                1145                1150
Arg Ala Leu Asp Pro Pro His Gln Met Glu Leu Thr Gln
        1155                1160                1165
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<210> 60
<211> 1166
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE

<222> 1..1166
<223> /mol_type="protein"
/note="epidermal growth factor isoform 3 preproprotein "
/organism="Homo sapiens"

<400> 60

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Met Leu Leu Thr Leu Ile Ile Leu Leu Pro Val Val Ser Lys Phe Ser
1               5                  10                  15
Phe Val Ser Leu Ser Ala Pro Gln His Trp Ser Cys Pro Glu Gly Thr
            20                  25                  30
Leu Ala Gly Asn Gly Asn Ser Thr Cys Val Gly Pro Ala Pro Phe Leu
        35                  40                  45
Ile Phe Ser His Gly Asn Ser Ile Phe Arg Ile Asp Thr Glu Gly Thr
    50                  55                  60
Asn Tyr Glu Gln Leu Val Val Asp Ala Gly Val Ser Val Ile Met Asp
65                  70                  75                  80
Phe His Tyr Asn Glu Lys Arg Ile Tyr Trp Val Asp Leu Glu Arg Gln
                85                  90                  95
Leu Leu Gln Arg Val Phe Leu Asn Gly Ser Arg Gln Glu Arg Val Cys
            100                 105                 110
Asn Ile Glu Lys Asn Val Ser Gly Met Ala Ile Asn Trp Ile Asn Glu
        115                 120                 125
Glu Val Ile Trp Ser Asn Gln Gln Glu Gly Ile Ile Thr Val Thr Asp
    130                 135                 140
Met Lys Gly Asn Asn Ser His Ile Leu Leu Ser Ala Leu Lys Tyr Pro
145                 150                 155                 160
Ala Asn Val Ala Val Asp Pro Val Glu Arg Phe Ile Phe Trp Ser Ser
                165                 170                 175
Glu Val Ala Gly Ser Leu Tyr Arg Ala Asp Leu Asp Gly Val Gly Val
            180                 185                 190
Lys Ala Leu Leu Glu Thr Ser Glu Lys Ile Thr Ala Val Ser Leu Asp
        195                 200                 205
Val Leu Asp Lys Arg Leu Phe Trp Ile Gln Tyr Asn Arg Glu Gly Ser
    210                 215                 220
Asn Ser Leu Ile Cys Ser Cys Asp Tyr Asp Gly Gly Ser Val His Ile
225                 230                 235                 240
Ser Lys His Pro Thr Gln His Asn Leu Phe Ala Met Ser Leu Phe Gly
                245                 250                 255
Asp Arg Ile Phe Tyr Ser Thr Trp Lys Met Lys Thr Ile Trp Ile Ala
            260                 265                 270
Asn Lys His Thr Gly Lys Asp Met Val Arg Ile Asn Leu His Ser Ser
        275                 280                 285
Phe Val Pro Leu Gly Glu Leu Lys Val Val His Pro Leu Ala Gln Pro
    290                 295                 300
Lys Ala Glu Asp Asp Thr Trp Glu Pro Glu Gln Lys Leu Cys Lys Leu
305                 310                 315                 320
Arg Lys Gly Asn Cys Ser Ser Thr Val Cys Gly Gln Asp Leu Gln Ser
                325                 330                 335
```

```
His Leu Cys Met Cys Ala Glu Gly Tyr Ala Leu Ser Arg Asp Arg Lys
            340                 345                 350
Tyr Cys Glu Asp Val Asn Glu Cys Ala Phe Trp Asn His Gly Cys Thr
        355                 360                 365
Leu Gly Cys Lys Asn Thr Pro Gly Ser Tyr Tyr Cys Thr Cys Pro Val
    370                 375                 380
Gly Phe Val Leu Leu Pro Asp Gly Lys Arg Cys His Gln Leu Val Ser
385                 390                 395                 400
Cys Pro Arg Asn Val Ser Glu Cys Ser His Asp Cys Val Leu Thr Ser
                405                 410                 415
Glu Gly Pro Leu Cys Phe Cys Pro Glu Gly Ser Val Leu Glu Arg Asp
            420                 425                 430
Gly Lys Thr Cys Ser Gly Cys Ser Ser Pro Asp Asn Gly Gly Cys Ser
        435                 440                 445
Gln Leu Cys Val Pro Leu Ser Pro Val Ser Trp Glu Cys Asp Cys Phe
    450                 455                 460
Pro Gly Tyr Asp Leu Gln Leu Asp Glu Lys Ser Cys Ala Ala Ser Gly
465                 470                 475                 480
Pro Gln Pro Phe Leu Leu Phe Ala Asn Ser Gln Asp Ile Arg His Met
                485                 490                 495
His Phe Asp Gly Thr Asp Tyr Gly Thr Leu Leu Ser Gln Gln Met Gly
            500                 505                 510
Met Val Tyr Ala Leu Asp His Asp Pro Val Glu Asn Lys Ile Tyr Phe
        515                 520                 525
Ala His Thr Ala Leu Lys Trp Ile Glu Arg Ala Asn Met Asp Gly Ser
    530                 535                 540
Gln Arg Glu Arg Leu Ile Glu Glu Gly Val Asp Val Pro Glu Gly Leu
545                 550                 555                 560
Ala Val Asp Trp Ile Gly Arg Arg Phe Tyr Trp Thr Asp Arg Gly Lys
                565                 570                 575
Ser Leu Ile Gly Arg Ser Asp Leu Asn Gly Lys Arg Ser Lys Ile Ile
            580                 585                 590
Thr Lys Glu Asn Ile Ser Gln Pro Arg Gly Ile Ala Val His Pro Met
        595                 600                 605
Ala Lys Arg Leu Phe Trp Thr Asp Thr Gly Ile Asn Pro Arg Ile Glu
    610                 615                 620
Ser Ser Ser Leu Gln Gly Leu Gly Arg Leu Val Ile Ala Ser Ser Asp
625                 630                 635                 640
Leu Ile Trp Pro Ser Gly Ile Thr Ile Asp Phe Leu Thr Asp Lys Leu
                645                 650                 655
Tyr Trp Cys Asp Ala Lys Gln Ser Val Ile Glu Met Ala Asn Leu Asp
            660                 665                 670
Gly Ser Lys Arg Arg Arg Leu Thr Gln Asn Asp Val Gly His Pro Phe
        675                 680                 685
Ala Val Ala Val Phe Glu Asp Tyr Val Trp Phe Ser Asp Trp Ala Met
    690                 695                 700
Pro Ser Val Met Arg Val Asn Lys Arg Thr Gly Lys Asp Arg Val Arg
705                 710                 715                 720
```

```
Leu Gln Gly Ser Met Leu Lys Pro Ser Ser Leu Val Val Val His Pro
                725                 730                 735
Leu Ala Lys Pro Gly Ala Asp Pro Cys Leu Tyr Gln Asn Gly Gly Cys
            740                 745                 750
Glu His Ile Cys Lys Lys Arg Leu Gly Thr Ala Trp Cys Ser Cys Arg
        755                 760                 765
Glu Gly Phe Met Lys Ala Ser Asp Gly Lys Thr Cys Leu Ala Leu Asp
    770                 775                 780
Gly His Gln Leu Leu Ala Gly Gly Glu Val Asp Leu Lys Asn Gln Val
785                 790                 795                 800
Thr Pro Leu Asp Ile Leu Ser Lys Thr Arg Val Ser Glu Asp Asn Ile
                805                 810                 815
Thr Glu Ser Gln His Met Leu Val Ala Glu Ile Met Val Ser Asp Gln
            820                 825                 830
Asp Asp Cys Ala Pro Val Gly Cys Ser Met Tyr Ala Arg Cys Ile Ser
        835                 840                 845
Glu Gly Glu Asp Ala Thr Cys Gln Cys Leu Lys Gly Phe Ala Gly Asp
    850                 855                 860
Gly Lys Leu Cys Ser Asp Ile Asp Glu Cys Glu Met Gly Val Pro Val
865                 870                 875                 880
Cys Pro Pro Ala Ser Ser Lys Cys Ile Asn Thr Glu Gly Gly Tyr Val
                885                 890                 895
Cys Arg Cys Ser Glu Gly Tyr Gln Gly Asp Gly Ile His Cys Leu Asp
            900                 905                 910
Ser Thr Pro Pro Pro His Leu Arg Glu Asp Asp His His Tyr Ser Val
        915                 920                 925
Arg Asn Ser Asp Ser Glu Cys Pro Leu Ser His Asp Gly Tyr Cys Leu
    930                 935                 940
His Asp Gly Val Cys Met Tyr Ile Glu Ala Leu Asp Lys Tyr Ala Cys
945                 950                 955                 960
Asn Cys Val Val Gly Tyr Ile Gly Glu Arg Cys Gln Tyr Arg Asp Leu
                965                 970                 975
Lys Trp Trp Glu Leu Arg His Ala Gly His Gly Gln Gln Gln Lys Val
            980                 985                 990
Ile Val Val Ala Val Cys Val Val Val Leu Val Met Leu Leu Leu Leu
        995                 1000                1005
Ser Leu Trp Gly Ala His Tyr Tyr Arg Thr Gln Lys Leu Leu Ser Lys
    1010                1015                1020
Asn Pro Lys Asn Pro Tyr Glu Glu Ser Ser Arg Asp Val Arg Ser Arg
1025                1030                1035                1040
Arg Pro Ala Asp Thr Glu Asp Gly Met Ser Ser Cys Pro Gln Pro Trp
                1045                1050                1055
Phe Val Val Ile Lys Glu His Gln Asp Leu Lys Asn Gly Gly Gln Pro
            1060                1065                1070
Val Ala Gly Glu Asp Gly Gln Ala Ala Asp Gly Ser Met Gln Pro Thr
        1075                1080                1085
Ser Trp Arg Gln Glu Pro Gln Leu Cys Gly Met Gly Thr Glu Gln Gly
    1090                1095                1100
```

```
Cys Trp Ile Pro Val Ser Ser Asp Lys Gly Ser Cys Pro Gln Val Met
1105                1110                1115                1120
Glu Arg Ser Phe His Met Pro Ser Tyr Gly Thr Gln Thr Leu Glu Gly
                1125                1130                1135
Gly Val Glu Lys Pro His Ser Leu Leu Ser Ala Asn Pro Leu Trp Gln
            1140                1145                1150
Gln Arg Ala Leu Asp Pro Pro His Gln Met Glu Leu Thr Gln
        1155                1160                1165

<210> 61
<211> 53
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..53
<223> /mol_type="protein"
      /note="mature epidermal growth factor"
      /organism="Homo sapiens"

<400> 61
Asn Ser Asp Ser Glu Cys Pro Leu Ser His Asp Gly Tyr Cys Leu His
1               5                   10                  15
Asp Gly Val Cys Met Tyr Ile Glu Ala Leu Asp Lys Tyr Ala Cys Asn
            20                  25                  30
Cys Val Val Gly Tyr Ile Gly Glu Arg Cys Gln Tyr Arg Asp Leu Lys
        35                  40                  45
Trp Trp Glu Leu Arg
    50

<210> 62
<211> 208
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..208
<223> /mol_type="protein"
      /note="heparin-binding EGF-like growth factor precursor"
      /organism="Homo sapiens"

<400> 62
Met Lys Leu Leu Pro Ser Val Val Leu Lys Leu Phe Leu Ala Ala Val
1               5                   10                  15
Leu Ser Ala Leu Val Thr Gly Glu Ser Leu Glu Arg Leu Arg Arg Gly
            20                  25                  30
```

```
Leu Ala Ala Gly Thr Ser Asn Pro Asp Pro Pro Thr Val Ser Thr Asp
        35                  40                  45
Gln Leu Leu Pro Leu Gly Gly Gly Arg Asp Arg Lys Val Arg Asp Leu
    50                  55                  60
Gln Glu Ala Asp Leu Asp Leu Leu Arg Val Thr Leu Ser Ser Lys Pro
65                  70                  75                  80
Gln Ala Leu Ala Thr Pro Asn Lys Glu Glu His Gly Lys Arg Lys Lys
                85                  90                  95
Lys Gly Lys Gly Leu Gly Lys Lys Arg Asp Pro Cys Leu Arg Lys Tyr
            100                 105                 110
Lys Asp Phe Cys Ile His Gly Glu Cys Lys Tyr Val Lys Glu Leu Arg
        115                 120                 125
Ala Pro Ser Cys Ile Cys His Pro Gly Tyr His Gly Glu Arg Cys His
    130                 135                 140
Gly Leu Ser Leu Pro Val Glu Asn Arg Leu Tyr Thr Tyr Asp His Thr
145                 150                 155                 160
Thr Ile Leu Ala Val Val Ala Val Val Leu Ser Ser Val Cys Leu Leu
                165                 170                 175
Val Ile Val Gly Leu Leu Met Phe Arg Tyr His Arg Arg Gly Gly Tyr
            180                 185                 190
Asp Val Glu Asn Glu Glu Lys Val Lys Leu Gly Met Thr Asn Ser His
        195                 200                 205
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<210> 63
<211> 86
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..86
<223> /mol_type="protein"
/note="mature heparin-binding EGF-like growth factor"
/organism="Homo sapiens"

<400> 63

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Asp Leu Gln Glu Ala Asp Leu Asp Leu Leu Arg Val Thr Leu Ser Ser
1               5                   10                  15
Lys Pro Gln Ala Leu Ala Thr Pro Asn Lys Glu Glu His Gly Lys Arg
            20                  25                  30
Lys Lys Lys Gly Lys Gly Leu Gly Lys Lys Arg Asp Pro Cys Leu Arg
        35                  40                  45
Lys Tyr Lys Asp Phe Cys Ile His Gly Glu Cys Lys Tyr Val Lys Glu
    50                  55                  60
Leu Arg Ala Pro Ser Cys Ile Cys His Pro Gly Tyr His Gly Glu Arg
65                  70                  75                  80
Cys His Gly Leu Ser Leu
                85
```

<210> 64
<211> 160
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..160
<223> /mol_type="protein"
/note="transforming growth factor alpha isoform 1 preproprotein"
/organism="Homo sapiens"

<400> 64
Met Val Pro Ser Ala Gly Gln Leu Ala Leu Phe Ala Leu Gly Ile Val
1 5 10 15
Leu Ala Ala Cys Gln Ala Leu Glu Asn Ser Thr Ser Pro Leu Ser Ala
20 25 30
Asp Pro Pro Val Ala Ala Ala Val Val Ser His Phe Asn Asp Cys Pro
35 40 45
Asp Ser His Thr Gln Phe Cys Phe His Gly Thr Cys Arg Phe Leu Val
50 55 60
Gln Glu Asp Lys Pro Ala Cys Val Cys His Ser Gly Tyr Val Gly Ala
65 70 75 80
Arg Cys Glu His Ala Asp Leu Leu Ala Val Val Ala Ala Ser Gln Lys
85 90 95
Lys Gln Ala Ile Thr Ala Leu Val Val Val Ser Ile Val Ala Leu Ala
100 105 110
Val Leu Ile Ile Thr Cys Val Leu Ile His Cys Cys Gln Val Arg Lys
115 120 125
His Cys Glu Trp Cys Arg Ala Leu Ile Cys Arg His Glu Lys Pro Ser
130 135 140
Ala Leu Leu Lys Gly Arg Thr Ala Cys Cys His Ser Glu Thr Val Val
145 150 155 160

<210> 65
<211> 159
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..159
<223> /mol_type="protein"
/note="transforming growth factor alpha isoform 2 preproprotein"
/organism="Homo sapiens"

<400> 65

```
Met Val Pro Ser Ala Gly Gln Leu Ala Leu Phe Ala Leu Gly Ile Val
1               5                  10                  15
Leu Ala Ala Cys Gln Ala Leu Glu Asn Ser Thr Ser Pro Leu Ser Asp
            20                  25                  30
Pro Pro Val Ala Ala Ala Val Val Ser His Phe Asn Asp Cys Pro Asp
        35                  40                  45
Ser His Thr Gln Phe Cys Phe His Gly Thr Cys Arg Phe Leu Val Gln
    50                  55                  60
Glu Asp Lys Pro Ala Cys Val Cys His Ser Gly Tyr Val Gly Ala Arg
65                  70                  75                  80
Cys Glu His Ala Asp Leu Leu Ala Val Val Ala Ala Ser Gln Lys Lys
                85                  90                  95
Gln Ala Ile Thr Ala Leu Val Val Val Ser Ile Val Ala Leu Ala Val
            100                 105                 110
Leu Ile Ile Thr Cys Val Leu Ile His Cys Cys Gln Val Arg Lys His
        115                 120                 125
Cys Glu Trp Cys Arg Ala Leu Ile Cys Arg His Glu Lys Pro Ser Ala
    130                 135                 140
Leu Leu Lys Gly Arg Thr Ala Cys Cys His Ser Glu Thr Val Val
145                 150                 155

<210> 66
<211> 161
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..161
<223> /mol_type="protein"
      /note="transforming growth factor alpha isoform 3 preproprotein"
      /organism="Homo sapiens"

<400> 66
Met Val Pro Ser Ala Gly Gln Leu Ala Leu Phe Ala Leu Gly Ile Val
1               5                  10                  15
Leu Ala Ala Cys Gln Ala Leu Glu Asn Ser Thr Ser Pro Leu Ser Asp
            20                  25                  30
Pro Pro Val Ala Ala Ala Val Val Ser His Phe Asn Asp Cys Pro Asp
        35                  40                  45
Ser His Thr Gln Phe Cys Phe His Gly Thr Cys Arg Phe Leu Val Gln
    50                  55                  60
Glu Asp Lys Pro Ala Cys Val Cys His Ser Gly Tyr Val Gly Ala Arg
65                  70                  75                  80
Cys Glu His Ala Asp Leu Leu Ala Val Val Ala Ala Ser Gln Lys Lys
                85                  90                  95
Gln Ala Ile Thr Ala Leu Val Val Val Ser Ile Val Ala Leu Ala Val
            100                 105                 110
```

```
Leu Ile Ile Thr Cys Val Leu Ile His Cys Cys Gln Val Arg Lys His
        115                 120                 125
Cys Glu Trp Cys Arg Ala Leu Ile Cys Arg His Glu Lys Pro Ser Ala
    130                 135                 140
Leu Leu Lys Gly Arg Thr Ala Cys Cys His Ser Glu Thr Ala Thr Leu
145                 150                 155                 160
Gly
```

<210> 67
<211> 163
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..163
<223> /mol_type="protein"
/note="transforming growth factor alpha isoform 4 preproprotein"
/organism="Homo sapiens"

<400> 67

```
Met Val Pro Ser Ala Gly Gln Leu Ala Leu Phe Ala Leu Gly Ile Val
1               5                   10                  15
Leu Ala Ala Cys Gln Ala Leu Glu Asn Ser Thr Ser Pro Leu Ser Ala
            20                  25                  30
Asp Pro Pro Val Ala Ala Ala Val Val Ser His Phe Asn Asp Cys Pro
        35                  40                  45
Asp Ser His Thr Gln Phe Cys Phe His Gly Thr Cys Arg Phe Leu Val
    50                  55                  60
Gln Glu Asp Lys Pro Ala Cys Val Cys His Ser Gly Tyr Val Gly Ala
65                  70                  75                  80
Arg Cys Glu His Ala Asp Leu Leu Ala Val Val Ala Ala Ser Gln Lys
                85                  90                  95
Lys Gln Ala Ile Thr Ala Leu Val Val Val Ser Ile Val Ala Leu Ala
            100                 105                 110
Val Leu Ile Ile Thr Cys Val Leu Ile His Cys Cys Gln Val Arg Lys
        115                 120                 125
His Cys Glu Trp Cys Arg Ala Leu Ile Cys Arg His Glu Lys Pro Ser
    130                 135                 140
Ala Leu Leu Lys Gly Arg Thr Ala Cys Cys His Ser Glu Thr Gly Cys
145                 150                 155                 160
Arg Leu Tyr
```

<210> 68
<211> 163
<212> PRT

```
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..163
<223> /mol_type="protein"
      /note="transforming growth factor alpha isoform 5 preproprotein "
      /organism="Homo sapiens"

<400> 68
Met Val Pro Ser Ala Gly Gln Leu Ala Leu Phe Ala Leu Gly Ile Val
1               5                   10                  15
Leu Ala Ala Cys Gln Ala Leu Glu Asn Ser Thr Ser Pro Leu Ser Ala
            20                  25                  30
Asp Pro Pro Val Ala Ala Ala Val Val Ser His Phe Asn Asp Cys Pro
        35                  40                  45
Asp Ser His Thr Gln Phe Cys Phe His Gly Thr Cys Arg Phe Leu Val
    50                  55                  60
Gln Glu Asp Lys Pro Ala Cys Val Cys His Ser Gly Tyr Val Gly Ala
65                  70                  75                  80
Arg Cys Glu His Ala Asp Leu Leu Ala Val Val Ala Ala Ser Gln Lys
                85                  90                  95
Lys Gln Ala Ile Thr Ala Leu Val Val Val Ser Ile Val Ala Leu Ala
            100                 105                 110
Val Leu Ile Ile Thr Cys Val Leu Ile His Cys Cys Gln Val Arg Lys
        115                 120                 125
His Cys Glu Trp Cys Arg Ala Leu Ile Cys Arg His Glu Lys Pro Ser
    130                 135                 140
Ala Leu Leu Lys Gly Arg Thr Ala Cys Cys His Ser Glu Thr Gly Cys
145                 150                 155                 160
Arg Leu Tyr


<210> 69
<211> 50
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..50
<223> /mol_type="protein"
      /note="mature transforming growth factor alpha"
      /organism="Homo sapiens"

<400> 69
Val Val Ser His Phe Asn Asp Cys Pro Asp Ser His Thr Gln Phe Cys
1               5                   10                  15
```

```
Phe His Gly Thr Cys Arg Phe Leu Val Gln Glu Asp Lys Pro Ala Cys
            20                  25                  30
Val Cys His Ser Gly Tyr Val Gly Ala Arg Cys Glu His Ala Asp Leu
        35                  40                  45
Leu Ala
    50
```

<210> 70
<211> 252
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..252
<223> /mol_type="protein"
/note="amphiregulin preproprotein "
/organism="Homo sapiens"

<400> 70

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Met Arg Ala Pro Leu Leu Pro Pro Ala Pro Val Val Leu Ser Leu Leu
1               5                   10                  15
Ile Leu Gly Ser Gly His Tyr Ala Ala Gly Leu Asp Leu Asn Asp Thr
            20                  25                  30
Tyr Ser Gly Lys Arg Glu Pro Phe Ser Gly Asp His Ser Ala Asp Gly
        35                  40                  45
Phe Glu Val Thr Ser Arg Ser Glu Met Ser Ser Gly Ser Glu Ile Ser
    50                  55                  60
Pro Val Ser Glu Met Pro Ser Ser Ser Glu Pro Ser Ser Gly Ala Asp
65                  70                  75                  80
Tyr Asp Tyr Ser Glu Glu Tyr Asp Asn Glu Pro Gln Ile Pro Gly Tyr
                85                  90                  95
Ile Val Asp Asp Ser Val Arg Val Glu Gln Val Val Lys Pro Pro Gln
            100                 105                 110
Asn Lys Thr Glu Ser Glu Asn Thr Ser Asp Lys Pro Lys Arg Lys Lys
        115                 120                 125
Lys Gly Gly Lys Asn Gly Lys Asn Arg Arg Asn Arg Lys Lys Lys Asn
    130                 135                 140
Pro Cys Asn Ala Glu Phe Gln Asn Phe Cys Ile His Gly Glu Cys Lys
145                 150                 155                 160
Tyr Ile Glu His Leu Glu Ala Val Thr Cys Lys Cys Gln Gln Glu Tyr
                165                 170                 175
Phe Gly Glu Arg Cys Gly Glu Lys Ser Met Lys Thr His Ser Met Ile
            180                 185                 190
Asp Ser Ser Leu Ser Lys Ile Ala Leu Ala Ala Ile Ala Ala Phe Met
        195                 200                 205
Ser Ala Val Ile Leu Thr Ala Val Ala Val Ile Thr Val Gln Leu Arg
    210                 215                 220
```

Arg Gln Tyr Val Arg Lys Tyr Glu Gly Glu Ala Glu Glu Arg Lys Lys
225 230 235 240
Leu Arg Gln Glu Asn Gly Asn Val His Ala Ile Ala
245 250

<210> 71
<211> 87
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..87
<223> /mol_type="protein"
/note="mature amphiregulin "
/organism="Homo sapiens"

<400> 71
Ser Val Arg Val Glu Gln Val Val Lys Pro Pro Gln Asn Lys Thr Glu
1 5 10 15
Ser Glu Asn Thr Ser Asp Lys Pro Lys Arg Lys Lys Lys Gly Gly Lys
20 25 30
Asn Gly Lys Asn Arg Arg Asn Arg Lys Lys Lys Asn Pro Cys Asn Ala
35 40 45
Glu Phe Gln Asn Phe Cys Ile His Gly Glu Cys Lys Tyr Ile Glu His
50 55 60
Leu Glu Ala Val Thr Cys Lys Cys Gln Gln Glu Tyr Phe Gly Glu Arg
65 70 75 80
Cys Gly Glu Lys Ser Met Lys
85

<210> 72
<211> 169
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..169
<223> /mol_type="protein"
/note="epiregulin preproprotein"
/organism="Homo sapiens"

<400> 72
Met Thr Ala Gly Arg Arg Met Glu Met Leu Cys Ala Gly Arg Val Pro
1 5 10 15
Ala Leu Leu Leu Cys Leu Gly Phe His Leu Leu Gln Ala Val Leu Ser
20 25 30

```
Thr Thr Val Ile Pro Ser Cys Ile Pro Gly Glu Ser Ser Asp Asn Cys
        35                  40                  45
Thr Ala Leu Val Gln Thr Glu Asp Asn Pro Arg Val Ala Gln Val Ser
    50                  55                  60
Ile Thr Lys Cys Ser Ser Asp Met Asn Gly Tyr Cys Leu His Gly Gln
65                  70                  75                  80
Cys Ile Tyr Leu Val Asp Met Ser Gln Asn Tyr Cys Arg Cys Glu Val
                85                  90                  95
Gly Tyr Thr Gly Val Arg Cys Glu His Phe Phe Leu Thr Val His Gln
            100                 105                 110
Pro Leu Ser Lys Glu Tyr Val Ala Leu Thr Val Ile Leu Ile Ile Leu
        115                 120                 125
Phe Leu Ile Thr Val Val Gly Ser Thr Tyr Tyr Phe Cys Arg Trp Tyr
    130                 135                 140
Arg Asn Arg Lys Ser Lys Glu Pro Lys Lys Glu Tyr Glu Arg Val Thr
145                 150                 155                 160
Ser Gly Asp Pro Glu Leu Pro Gln Val
                165
```

<210> 73
<211> 49
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..49
<223> /mol_type="protein"
/note="mature epiregulin "
/organism="Homo sapiens"

<400> 73

```
Val Ala Gln Val Ser Ile Thr Lys Cys Ser Ser Asp Met Asn Gly Tyr
1               5                   10                  15
Cys Leu His Gly Gln Cys Ile Tyr Leu Val Asp Met Ser Gln Asn Tyr
            20                  25                  30
Cys Arg Cys Glu Val Gly Tyr Thr Gly Val Arg Cys Glu His Phe Phe
        35                  40                  45
Leu
```

<210> 74
<211> 154
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE

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<222> 1..154
<223> /mol_type="protein"
      /note="epigen isoform 1 precursor"
      /organism="Homo sapiens"

<400> 74
Met Ala Leu Gly Val Pro Ile Ser Val Tyr Leu Leu Phe Asn Ala Met
1               5                  10                  15
Thr Ala Leu Thr Glu Glu Ala Ala Val Thr Val Thr Pro Pro Ile Thr
            20                  25                  30
Ala Gln Gln Gly Asn Trp Thr Val Asn Lys Thr Glu Ala Asp Asn Ile
        35                  40                  45
Glu Gly Pro Ile Ala Leu Lys Phe Ser His Leu Cys Leu Glu Asp His
    50                  55                  60
Asn Ser Tyr Cys Ile Asn Gly Ala Cys Ala Phe His His Glu Leu Glu
65                  70                  75                  80
Lys Ala Ile Cys Arg Cys Phe Thr Gly Tyr Thr Gly Glu Arg Cys Glu
                85                  90                  95
His Leu Thr Leu Thr Ser Tyr Ala Val Asp Ser Tyr Glu Lys Tyr Ile
            100                 105                 110
Ala Ile Gly Ile Gly Val Gly Leu Leu Leu Ser Gly Phe Leu Val Ile
        115                 120                 125
Phe Tyr Cys Tyr Ile Arg Lys Arg Cys Leu Lys Leu Lys Ser Pro Tyr
    130                 135                 140
Asn Val Cys Ser Gly Glu Arg Arg Pro Leu
145                 150

<210> 75
<211> 133
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..133
<223> /mol_type="protein"
      /note="epigen isoform 2 precursor"
      /organism="Homo sapiens"

<400> 75
Met Ala Leu Gly Val Pro Ile Ser Val Tyr Leu Leu Phe Asn Ala Met
1               5                  10                  15
Thr Ala Leu Thr Glu Glu Ala Ala Val Thr Val Thr Pro Pro Ile Thr
            20                  25                  30
Ala Gln Gln Ala Asp Asn Ile Glu Gly Pro Ile Ala Leu Lys Phe Ser
        35                  40                  45
His Leu Cys Leu Glu Asp His Asn Ser Tyr Cys Ile Asn Gly Ala Cys
    50                  55                  60
```

```
Ala Phe His His Glu Leu Glu Lys Ala Ile Cys Arg Cys Phe Thr Gly
65                  70                  75                  80
Tyr Thr Gly Glu Arg Cys Glu His Leu Thr Leu Thr Ser Tyr Ala Val
                85                  90                  95
Asp Ser Tyr Glu Lys Tyr Ile Ala Ile Gly Ile Gly Val Gly Leu Leu
            100                 105                 110
Leu Ser Gly Phe Leu Val Ile Phe Tyr Cys Tyr Ile Arg Lys Arg Tyr
        115                 120                 125
Glu Lys Asp Lys Ile
    130
```

<210> 76
<211> 112
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..112
<223> /mol_type="protein"
/note="epigen isoform 3 precursor"
/organism="Homo sapiens"

<400> 76

```
Met Ala Leu Gly Val Pro Ile Ser Val Tyr Leu Leu Phe Asn Ala Met
1               5                  10                  15
Thr Ala Leu Thr Glu Glu Ala Ala Val Thr Val Thr Pro Pro Ile Thr
            20                  25                  30
Ala Gln Gln Gly Asn Trp Thr Val Asn Lys Thr Glu Ala Asp Asn Ile
        35                  40                  45
Glu Gly Pro Ile Ala Leu Lys Phe Ser His Leu Cys Leu Glu Asp His
    50                  55                  60
Asn Ser Tyr Cys Ile Asn Gly Ala Cys Ala Phe His His Glu Leu Glu
65                  70                  75                  80
Lys Ala Ile Cys Arg Cys Phe Thr Gly Tyr Thr Gly Glu Arg Cys Leu
                85                  90                  95
Lys Leu Lys Ser Pro Tyr Asn Val Cys Ser Gly Glu Arg Arg Pro Leu
            100                 105                 110
```

<210> 77
<211> 103
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..103
<223> /mol_type="protein"

/note="epigen isoform 4 precursor "
/organism="Homo sapiens"

<400> 77
Met Ala Leu Gly Val Pro Ile Ser Val Tyr Leu Leu Phe Asn Ala Met
1 5 10 15
Thr Ala Leu Thr Glu Glu Ala Ala Val Thr Val Thr Pro Pro Ile Thr
20 25 30
Ala Gln Gln Gly Asn Trp Thr Val Asn Lys Thr Glu Ala Asp Asn Ile
35 40 45
Glu Gly Pro Ile Ala Leu Lys Phe Ser His Leu Cys Leu Glu Asp His
50 55 60
Asn Ser Tyr Cys Ile Asn Gly Ala Cys Ala Phe His His Glu Leu Glu
65 70 75 80
Lys Ala Ile Cys Arg Cys Leu Lys Leu Lys Ser Pro Tyr Asn Val Cys
85 90 95
Ser Gly Glu Arg Arg Pro Leu
100

<210> 78
<211> 103
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..103
<223> /mol_type="protein"
/note="epigen isoform 5 precursor "
/organism="Homo sapiens"

<400> 78
Met Ala Leu Gly Val Pro Ile Ser Val Tyr Leu Leu Phe Asn Ala Met
1 5 10 15
Thr Ala Leu Thr Glu Glu Ala Ala Val Thr Val Thr Pro Pro Ile Thr
20 25 30
Ala Gln Gln Ala Asp Asn Ile Glu Gly Pro Ile Ala Leu Lys Phe Ser
35 40 45
His Leu Cys Leu Glu Asp His Asn Ser Tyr Cys Ile Asn Gly Ala Cys
50 55 60
Ala Phe His His Glu Leu Glu Lys Ala Ile Cys Arg Cys Phe Thr Gly
65 70 75 80
Tyr Thr Gly Glu Arg Cys Leu Lys Leu Lys Ser Pro Tyr Asn Val Cys
85 90 95
Ser Gly Glu Arg Arg Pro Leu
100

<210> 79

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<211> 94
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..94
<223> /mol_type="protein"
      /note="epigen isoform 6 precursor "
      /organism="Homo sapiens"

<400> 79
Met Ala Leu Gly Val Pro Ile Ser Val Tyr Leu Leu Phe Asn Ala Met
1               5                   10                  15
Thr Ala Leu Thr Glu Glu Ala Ala Val Thr Val Thr Pro Pro Ile Thr
            20                  25                  30
Ala Gln Gln Ala Asp Asn Ile Glu Gly Pro Ile Ala Leu Lys Phe Ser
        35                  40                  45
His Leu Cys Leu Glu Asp His Asn Ser Tyr Cys Ile Asn Gly Ala Cys
    50                  55                  60
Ala Phe His His Glu Leu Glu Lys Ala Ile Cys Arg Cys Leu Lys Leu
65                  70                  75                  80
Lys Ser Pro Tyr Asn Val Cys Ser Gly Glu Arg Arg Pro Leu
                85                  90

<210> 80
<211> 73
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..73
<223> /mol_type="protein"
      /note="epigen isoform 7 precursor "
      /organism="Homo sapiens"

<400> 80
Met Ala Leu Gly Val Pro Ile Ser Val Tyr Leu Leu Phe Asn Ala Asp
1               5                   10                  15
Asn Ile Glu Gly Pro Ile Ala Leu Lys Phe Ser His Leu Cys Leu Glu
            20                  25                  30
Asp His Asn Ser Tyr Cys Ile Asn Gly Ala Cys Ala Phe His His Glu
        35                  40                  45
Leu Glu Lys Ala Ile Cys Arg Cys Leu Lys Leu Lys Ser Pro Tyr Asn
    50                  55                  60
Val Cys Ser Gly Glu Arg Arg Pro Leu
65                  70
```

<210> 81
<211> 132
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..132
<223> /mol_type="protein"
/note="mature epigen "
/organism="Homo sapiens"

<400> 81
Ala Ala Val Thr Val Thr Pro Pro Ile Thr Ala Gln Gln Gly Asn Trp
1 5 10 15
Thr Val Asn Lys Thr Glu Ala Asp Asn Ile Glu Gly Pro Ile Ala Leu
20 25 30
Lys Phe Ser His Leu Cys Leu Glu Asp His Asn Ser Tyr Cys Ile Asn
35 40 45
Gly Ala Cys Ala Phe His His Glu Leu Glu Lys Ala Ile Cys Arg Cys
50 55 60
Phe Thr Gly Tyr Thr Gly Glu Arg Cys Glu His Leu Thr Leu Thr Ser
65 70 75 80
Tyr Ala Val Asp Ser Tyr Glu Lys Tyr Ile Ala Ile Gly Ile Gly Val
85 90 95
Gly Leu Leu Leu Ser Gly Phe Leu Val Ile Phe Tyr Cys Tyr Ile Arg
100 105 110
Lys Arg Cys Leu Lys Leu Lys Ser Pro Tyr Asn Val Cys Ser Gly Glu
115 120 125
Arg Arg Pro Leu
130

<210> 82
<211> 178
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..178
<223> /mol_type="protein"
/note="betacellulin precursor "
/organism="Homo sapiens"

<400> 82
Met Asp Arg Ala Ala Arg Cys Ser Gly Ala Ser Ser Leu Pro Leu Leu
1 5 10 15

eolf-seql

```
Leu Ala Leu Ala Leu Gly Leu Val Ile Leu His Cys Val Val Ala Asp
            20                  25                  30
Gly Asn Ser Thr Arg Ser Pro Glu Thr Asn Gly Leu Leu Cys Gly Asp
        35                  40                  45
Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys Gly
    50                  55                  60
His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys Gly
65                  70                  75                  80
Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys Asp
                85                  90                  95
Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp Leu Phe Tyr Leu
            100                 105                 110
Arg Gly Asp Arg Gly Gln Ile Leu Val Ile Cys Leu Ile Ala Val Met
        115                 120                 125
Val Val Phe Ile Ile Leu Val Ile Gly Val Cys Thr Cys Cys His Pro
    130                 135                 140
Leu Arg Lys Arg Arg Lys Arg Lys Lys Lys Glu Glu Glu Met Glu Thr
145                 150                 155                 160
Leu Gly Lys Asp Ile Thr Pro Ile Asn Glu Asp Ile Glu Glu Thr Asn
                165                 170                 175
Ile Ala
```

<210> 83
<211> 80
<212> PRT
<213> Homo sapiens

<220>
<221> SOURCE
<222> 1..80
<223> /mol_type="protein"
/note="mature betacellulin "
/organism="Homo sapiens"

<400> 83

```
Asp Gly Asn Ser Thr Arg Ser Pro Glu Thr Asn Gly Leu Leu Cys Gly
1               5                   10                  15
Asp Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys
            20                  25                  30
Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
        35                  40                  45
Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys
    50                  55                  60
Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp Leu Phe Tyr
65                  70                  75                  80
```